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IASR/AFSP

International Summit on Suicide Research

New Horizons for Suicide Research: From Genes to Communities

IASR International Academy of Suicide Research

American Foundation for Suicide Prevention

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Plenary and Special Session Abstracts

MORSELLI LIVING ROOM DISCUSSION

Moderator: John Mann, Columbia University & New York State Psychiatric Institute

Participant: Victoria Arango, NYS Psychiatric Institute

This session is a living room style discussion with Dr. Victoria Arango, one of the co-recipients of the IASR Morselli Award. This session will focus on Dr. Arango's most important research findings, lessons drawn from those findings, and next steps in research following those findings.

DEBATE: HIGH RISK VS. POPULATION APPROACHES TO SAVING LIVES

Moderator: Jill Harkavy-Friedman, American Foundation for Suicide Prevention

Participants: John Mann, Columbia University & New York State Psychiatric Institute
Eric Caine, University of Rochester Medical Center

There are many approaches to understanding and preventing suicide, including studying individuals at high risk or adopting a public health approach. These different approaches have specific basic assumptions about the mechanisms underlying suicide and its prevention which, in turn, inform research design and subsequent findings. Dr. Mann and Dr. Caine have devoted their careers to suicide prevention research applying different approaches to conceptualizing and studying suicide. They will discuss the value and limits of each approach as well as the potential impact of each approach on reducing suicide rates.

LIVING ROOM DISCUSSION: LIVED EXPERIENCE

Participants: Jo Robinson, Orygen
Steve Iselin, Department of Navy
Stephen O'Connor, University of Louisville, School of Medicine
Jessica Caudle, Texas Health Resources Harris Methodist Hospital, Fort Worth

Living Room Discussion on The Role of Lived Experience in Research

KEYNOTE SESSION: **PERSPECTIVES ON THE FUTURE OF SUICIDE RESEARCH**

Chair: Yeates Conwell, University of Rochester School of Medicine

In this plenary session leaders of two of the most prominent organizations in the effort to address suicide-related morbidity and mortality will offer their perspectives on a way forward. First, Maria Oquendo, MD, President of the American Psychiatric Association, will make the case for why suicidal behavior should be considered as a distinct diagnosis in psychiatric nosology, and review the ways in which such a change would contribute to lives saved from suicide. The second speaker will be Joshua Gordon, MD, PhD, Director of the National Institute of Mental Health. Dr. Gordon will provide an overview of the support that

NIMH provides to the research community, research priorities, and the plan for what lies ahead in suicide prevention research.

SUICIDE PREVENTION: A VIEW FROM THE NIMH

Joshua Gordon, National Institute of Mental Health

The NIMH supports a number of research efforts aimed at identifying individuals at high-risk and improving outcomes through better referral, follow-up, and intervention methods. I will describe these efforts and discuss a plan for suicide prevention research going forwards.

THE ESSENTIAL NEED FOR SUICIDAL BEHAVIOR AS A SEPARATE DIAGNOSIS

Maria Oquendo, University of Pennsylvania

There are several conceptual reasons why suicidal behavior should be a separate diagnosis. Among them are the fact that the occurrence of suicidal behavior is not restricted to Major Depressive Episode or Borderline Personality Disorders, the only two diagnoses where it is listed as a symptom. Importantly, as electronic medical records become a major source of data for generating new medical knowledge, having a diagnostic code can literally put suicidal behavior on the map. The ways in which this strategy may save lives will be addressed.

CLOSING KEYNOTE: SUICIDE IN UNDER-SERVED POPULATIONS

Chair: Christine Moutier, American Foundation for Suicide Prevention

This closing keynote "Suicide in Underserved Populations" will demonstrate that suicide prevention can effectively occur anywhere, for any population. Dr. Vijayakumar will describe her work and outcomes of suicide prevention strategies with a Sri Lankan refugee population. Her talk will demonstrate that even in the most challenging of conditions, engaging people in suicide risk reducing interventions can make a difference. The second and closing presentation by Dr. Verdeli will provide a global perspective on suicide prevention methods, focusing on multiple strategies from policy to clinical to research opportunities.

A CITY THAT DISAPPEARS EVERY YEAR: GLOBAL PERSPECTIVES ON SUICIDE

Lena Verdeli, Teachers College, Columbia University

Every year, 78% of the 800,000 suicides around the world occur in low and middle income countries. This presentation will review the global landscape of suicidality by examining: epidemiological findings on rates and methods of suicide in high, middle and low income regions, with a focus on methods to address under-reporting and misclassifying suicides (e.g., the Million Death study in India); profiles of risks and social/environmental determinants of suicide around the globe; the role of policy in suicide prevention (decriminalization of attempts, adoption of a national strategy for suicide prevention, restriction to means);

evidence of effectiveness of community initiatives for suicide prevention, including the World Health Organization community prevention toolkit; clinical management options of safety planning in the absence of capacity to access medical/mental health facility; and funding opportunities for suicide research from global donors.

SUICIDE AMONG REFUGEES - A MOCKERY OF HUMANITY

Lakshmi Vijayakumar

The UNHCR states that there are 21.3 million refugees and 3.2 million asylum seekers in the year 2016. Developing countries host 86% of the world refugees i.e. 13.9 million. The least developed country hosted 4.2 million refugees which was about 26% of the global total. Children below the age of 18 years constituted 51% of the refugee population.
The prevalence of suicidal behavior among refugees ranges between 3.4% and 34%. Despite the enormity of the problem, there has been little research about suicide and its prevention among refugees.

CASP An intervention was designed to prevent suicide among the Sri Lankan refugees residing in camps in Tamil Nadu. At present, there are 68,000 Sri Lankan refugees in 110 camps. By random method, two camps were selected and one was allocated to the intervention arm and the other to the control arm. Among the camp inmates, a high-risk group was identified. The intervention was a combination of provision of regular contacts and safety plan(CASP) delivered by lay persons from the camps who were trained by volunteers of a suicide prevention NGO, SNEHA. 639 refugees from the intervention and 664 from the control camps participated. Of the 288 high risk refugees in the intervention camp, 139 completed the intervention. In the control camp 187 were categorised as high-risk. Prevalence of suicide attempts was 6.1% Following intervention, the differences between sites in changes in combined suicides (attempted suicides and suicides) rates per 100,000 per year was 519 (95% CI: 136, 902; $p < 0.01$).

Low cost and culturally appropriate interventions like CASP are urgently needed to address the major public health issue of suicide among refugees.

Preventing suicides among refugees is the responsibility of the humankind and ignoring it will be a mockery of humanity

Symposia Session Abstracts

1. TOWARD MORE PRECISE UNDERSTANDING OF SUICIDAL STATES

Chair: E. David Klonsky, University of British Columbia

Overall Abstract: Recent reviews find that suicide prediction and prevention have failed to meaningfully improve in recent decades. The lack of progress is concerning, and has spurred calls for more precise characterization of suicidal processes and risk. For example, Klonsky and May (2014) proposed that an ideation-to-action framework should guide all of suicide research, theory, and prevention. From this perspective, the a) development of suicidal ideation and b) progression from ideation to potentially lethal attempts are viewed as different processes with different predictors and explanations. This distinction is critical because most suicide ideators do not attempt, and because traditionally cited risk factors for suicide – including depression, hopelessness, most psychiatric disorders, and even impulsivity – robustly predict ideation but not attempts among ideators (Klonsky and May, 2014; Klonsky et al., 2016). Fortunately, in just the past 2-3 years since the framework's publication, dozens of new studies have been conducted addressing the distinction between suicidal thoughts and behaviour (Klonsky et al., 2017).

However, even if research embraces the framework and considers the development of ideation and progression from ideation to attempts as two distinct processes, there is still considerable nuance within each of these processes. For example, some instances of suicidal ideation lead to attempts but most do not. The measurement and characterization of suicidal ideation and states must become more detailed and precise if we are to better understand suicidal processes and risk. The present symposium was conceived to address this need. Our stellar panel of presenters includes four experts from three countries, who will each present recent findings that improve our understanding of suicidal states.

E. David Klonsky, PhD, will present data on the differentiation of suicidal desire from the larger construct of suicidal ideation. Dr. Klonsky uses data from samples in both North American and Europe to demonstrate the validity and importance of the distinction between suicidal desire and ideation. Moreover, he shows how failing to consider this distinction can lead studies to underestimate the predictive utility of key risk factors and contemporary theories of suicide. He concludes with specific recommendations for the design and execution of future studies on suicidal ideation.

Kim van Orden, PhD, will present data from a large Swedish sample of older adults (n=1,036). Dr. van Orden's utilized a prospective design to examine two forms of suicidal ideation: "thinking life isn't worth living" vs. "wishing for death". Strikingly, Dr. van Orden finds that the latter, but not the former, prospectively predicts all-cause mortality.

Dr. Barbara Stanley, PhD, will present data from a patient sample. Dr. Stanley finds two distinct subtypes of suicidal individuals that are distinguished by temporal variation in suicidal ideation as well as cortisol response to stressors.

Finally, Dr. Rory O'Connor, PhD, also examines cortisol response, but in three subgroups of individuals: those with: suicide attempts, suicide ideation but not attempts, and nonsuicidal controls. Dr. O'Connor finds that cortisol response to a stressor is blunted in ideators compared to controls, and further blunted in attempters compared to ideators.

Results from these studies help make sense of the heterogeneity in suicidal ideation and behaviour, and develop more precise research questions and target constructs for future studies.

1.1 DEFINING SUICIDAL PHENOTYPES: STRESS RESPONSIVE AND NON STRESS RESPONSIVE SUBTYPES

Barbara Stanley*[1], Hanga Galfalvy[2], John Keilp[3], Sadia Chaudhury[3], Sebastian Cisneros[4], Maria Oquendo[5], John Mann[3]

[1]College of Physicians & Surgeons, Columbia University, [2]Columbia University, [3]Columbia University/NYS Psychiatric Institute, [4]New York State Psychiatric Institute, [5]University of Pennsylvania

The stress-diathesis model of suicidal behavior proposes that suicide risk is determined by an underlying diathesis, neurobiological in nature, that triggers suicidal behavior in the presence of stressors. While attempts to elucidate this unified model of suicidal behavior have identified some neurobiological and clinical factors associated with suicidal behavior, the model has had only limited utility with findings typically in the modest range. For example, the hypothalamic-pituitary-adrenal (HPA) axis dysregulation has been implicated in suicidal behavior (Mann et al 2003, McGirr et al 2010, Melhem et al 2016). However, findings are mixed and modest. We propose that the mixed findings can be accounted for by identifying suicidal subtypes, one that is stress responsive and one that does not respond to stress.
In this study, we utilize the Trier Social Stress Test (TSST), a highly effective psychosocial stress paradigm used to measure HPA axis activation (Kirschbaum et al, 1993) in response to social stress in a laboratory setting. We also employ Ecological Momentary Assessment (EMA), real-time data collection in an individual's natural setting, to identify patterns and changes in suicidal ideation, stressors, affects and self harm behaviors within a natural context. The purpose of this study is to determine whether we can identify a stress responsive suicidal subtype.
We enrolled 43 participants who were recruited for a suicide and non suicidal self injury treatment study that examined mechanisms of action. The procedures took place at baseline prior to the start of treatment and while participants were medication-free. Participants performed the Trier Social Stress Test (TSST) with 5 consecutive salivary cortisol samples obtained. Cortisol level distribution was normalized using natural logarithmic transformation and the primary measure of cortisol response was the area under the cortisol curve measured from the participant's baseline level. Patterns of suicidal ideation and changes in response to daily stressors were obtained using the Ecological Momentary Assessment (EMA) for seven days/6 times/day. Using median split of the within-subject standard deviations of the ideation score, participants were divided into low variability and high variability subjects.
We found that participants with higher suicide ideation variability and greater increases in suicidal ideation in response to daily stressors had an exaggerated cortisol response. ($t=2.28$, $df=41$, $p=0.027$, r-=0.34, Mean high variability group=5.01 Mean low variability group=-2.87, Two Sample t-test=-1.96, $df=41$, $p=0.056$). In contrast, individuals with a steady, unfluctuating pattern with elevated ideation do not have a heightened stress response. The high variability group had higher hopelessness and hostility scores on a trend level than the low variability group ($p=0.058$; $p=0.087$). These results suggest that there may be at least two subtypes of suicidal individuals with different patterns of suicide ideation with different

neurobiological substrates, stress responsive and non-stress responsive. Individuals with ideation pattern which fluctuates over short periods of time exhibit higher stress response.

1.2 DISTINGUISHING SUICIDAL DESIRE FROM SUICIDAL IDEATION: IMPLICATIONS FOR RESEARCHERS AND RESEARCH DESIGN

E. David Klonsky*[1], Katie Dhingra[2]

[1]University of British Columbia, [2]Leeds Beckett University

A recent review by Joe Franklin and colleagues suggests that the researcher's ability to predict suicide has not improved over the past 50 years. In parallel, epidemiological data from the World Health Organizations and US Centre for Disease Control suggest that the suicide prevention field has struggled to achieve meaningful and sustained reductions in suicide. These findings have led some to conclude that the majority of studies on suicide and suicide risk have been insufficiently precise in the conceptualization and measurement of suicidal processes and suicide-related variables. This presentation highlights one area in which the field has been insufficiently precise: the differentiation of suicidal desire (i.e., desire for suicide) from the larger construct of suicidal ideation (i.e., the universe of thoughts one might have about suicide).

This presentation describes findings from both North American and European samples that were administered the Beck Scale for Suicide Ideation (BSS). I first show that that items assessing suicidal desire can be meaningfully distinguished from items assessing other aspects of suicidal ideation (e.g., planning, perceptions of capability to make an attempt). The separation of items indicating suicidal desire from items indicating other kinds of suicidal ideation can be accomplished through several different methodologies, ranging from factor analysis to judgments of face validity, each of which converge on similar findings. Second, I show that this distinction has a meaningful impact on the results and interpretation of analyses addressing key research questions. For example, analyses designed to test contemporary theories of suicide ideation – including the Interpersonal Theory (Joiner, 2005) and Three-Step-Theory (Klonsky & May, 2015) – yield strong support when focusing on items indicating suicidal desire, but weak support when focusing on other kinds of suicidal ideation. This pattern is actually consistent with theoretical predictions, but could be interpreted as indicating mixed findings if one does not account for the distinction between suicidal desire and suicidal ideation.

Finally, and perhaps most importantly, when items assessing suicidal desire and other forms of ideation are combined into a single scale, the predictive validity of key suicide constructs becomes 'diluted'. This finding potentially suggests that hundreds of studies have underestimated the relationship of key risk factors to suicidal desire because scoring instructions for the BSS and many other measures of suicidal ideation combine items indexing suicidal desire and other forms of ideation into a single score. Thus, our findings have important implications for future studies regarding research design and the optimal measurement of suicidal desire and ideation.

1.3 PASSIVE SUICIDE IDEATION IN OLDER ADULTS: A SIGN OF RISK FOR SUICIDE?

Kim Van Orden*[1], Ingmar Skoog[2], Mattias Jonson[2], Margda Waern[2]

[1]University of Rochester School of Medicine, [2]University of Gothenburg

Suicide in later life is a significant public health problem, and given population aging, we can, therefore, anticipate a very large rise in the number of older men who will die by suicide in coming decades.

Thoughts of one's own death, that one would be better off dead, or wishing for one's death are termed death ideation or passive suicidal ideation, while thoughts of suicide or of killing oneself are termed suicide ideation or active suicidal ideation. Given the increased saliency of one's own death later in life, a passive wish to die may represent engagement in a normative process of coming to terms with one's mortality. Data do not exist to answer the question of whether passive ideation confers risk for premature mortality—all-cause or suicide—and thus, whether it is an indicator of engaging with the aging process, or conversely whether it is a sign of significant distress and an indicator of risk for suicide.

Some data indicate that older adults who present with passive suicide ideation are similar in their clinical presentations to older adults who present with active suicide ideation (Szanto et al., 1996), suggesting that that both active and passive suicide ideation function as indicators of increased suicide risk in later life. Our research group conducted two studies examining the question of whether passive suicide ideation appears to be an indicator of suicide risk in older adults—one with a population-based sample of older adults aged 85 (Van Orden et al, 2013) and the other with a distressed sample of older adults seeking aging services (Van Orden et al., 2014). Both studies used latent class analysis (LCA) to understand the clinical characteristics of older adults who endorsed either of two types of passive suicide ideation: thoughts that they would be better off dead, and/or wishes for their own death (using the Paykel Scale). We found that most older adults who reported either form of passive ideation also presented with other significant risk factors for suicide, including psychological distress (i.e., depression and/or anxiety symptoms) and/or histories of serious suicide ideation in their lifetime (i.e., worst-point suicide ideation, which has been shown to elevate risk for suicide). However, in the distressed sample of older adults, our findings also indicated that for a small number of older adults, thoughts that life is not worth living were not coupled with indicators of suicide risk and thus may indicate dissatisfaction with life that is unlikely to progress to more dangerous forms of suicide ideation. These data suggest that thoughts that life is not worth living and desire for death are not equivalently associated with suicide risk and should not necessarily be grouped together as passive suicide ideation. This presentation will present novel prospective analyses comparing thoughts that life is not worth living to wishing for one's death in terms of negative health outcomes, including all-cause mortality.

The prospective analyses involve 1,036 older adults (n=408 male) selected from the Swedish population register. Subjects completed psychiatric evaluations and self-report measures, including the Paykel Scale. Potential subjects with dementia were excluded prior to collection of these measures. Results indicate that subjects who reported thoughts that they were better off dead were not at elevated risk for premature mortality (IRR=0.999, p=.531). In contrast, subjects who reported wishing for death lived significantly fewer days (after their initial assessment) compared to those who did not endorse wishes for death (IRR=0.863, $p<0.0001$). Findings will be discussed with regards to increasing our understanding of the presentation of older adults at risk for suicide.

1.4 CORTISOL REACTIVITY AND SUICIDAL BEHAVIOUR: CLARIFYING SUICIDAL STATES IN SUICIDE ATTEMPTERS AND IDEATORS

Rory O'Connor*[1]

[1]University of Glasgow

The causes of suicidal behavior are not fully understood. Dysregulated hypothalamic-pituitary-adrenal (HPA) axis activity, as measured by cortisol levels, is one potential risk factor. In an attempt at clarifying suicidal states, the current study aimed to investigate whether cortisol reactivity to a laboratory stress task differentiated individuals who had previously made a suicide attempt from those who had thought about suicide (suicide ideators) and control participants. One hundred and sixty participants were recruited to a previous attempt, a suicidal ideation or a control group. Participants completed background questionnaires before completing the Maastricht Acute Stress Test (MAST). Cortisol levels were assessed throughout the stress task. Measures of suicide behavior were measured at baseline, 1 month and 6 month follow-up. Participants who had made a previous suicide attempt exhibited signif- icantly lower aggregate cortisol levels during the MAST compared to participants in the control group; suicide ideators were intermediate to both groups. This effect, however, was driven by participants who made an attempt within the past year, and to some degree by those with a family history of attempt. Participants who made a suicide attempt and had a family history of suicide exhibited the lowest levels of cortisol in response to stress. Finally, lower levels of cortisol in response to the MAST were associated with higher levels of suicidal ideation at 1-month follow-up in the suicide attempter group. These results are consistent with other findings indicating that blunted HPA axis activity is associated with some forms of suicidal behavior. The challenge for researchers is to elucidate the precise causal mechanisms linking stress, cortisol and different suicidal states.

2. CHALLENGING FUNDAMENTAL ASSUMPTIONS ABOUT THE NATURE OF SUICIDE AND SUICIDE RISK: INSIGHTS FROM MACHINE LEARNING STUDIES

Chair: Joseph Franklin, Florida State University

Overall Abstract: Despite an exponential increase in suicide research and prevention efforts, the rates of suicidal behaviors have been on the rise in recent decades. This suggests that existing theories may not adequately account for the nature of suicide risk. Indeed, a recent comprehensive meta-analysis found that no theory constructs predict future suicidal behaviors much better than random guessing (AUCs = 0.50s; Franklin et al., 2017). This indicates that, although many constructs may be correlated with suicidal behaviors, these constructs do not play a major causal role in these behaviors (cf. Kraemer et al., 1997). Taken together, these lines of evidence suggest a need to re-examine some of our fundamental assumptions about the nature of suicide risk. This symposium will show how machine learning evidence challenges traditional assumptions and supports new ones. Consistent with the theme of this year's conference, this symposium represents a New Horizon in suicide research with broad implications for the field.

The first three talks in this symposium will challenge the fundamental assumption that the causes of suicidal behaviors can (and should) be reduced to a small number of biopsychosocial constructs. Most existing theories of suicide, which propose that an additive or multiplicative combination of a small number of factors (i.e., 1 – 10) cause suicidal thoughts and behaviors, subscribe to this assumption. The data from these talks will instead support a novel alternative assumption based on a more broadly accepted philosophy of

causality called INUS conditions (Mackie, 1965). This philosophy is consistent with complexity theory (e.g., Waldrop, 1993), and the view that thoughts and behaviors in general (Barrett, 2012) and suicidal thoughts and behaviors in particular (Ribeiro et al., 2016) emerge from a complex and indeterminate biopsychosocial system. In essence, this assumption proposes that only the complex combination of many (i.e., hundreds of) biopsychosocial constructs will approximate the causes of phenomena like suicidal behaviors. As a result, only large and complex sets of biopsychosocial constructs will be able to accurately classify and predict suicidal thoughts and behaviors.

In the first talk, Dr. Colin Walsh will draw on a large longitudinal dataset (3,250 suicide attempters; 22,958 total controls) to present evidence consistent with the complexity assumption. Specifically, he will show that hundreds of constructs combined with machine learning techniques (AUCs = 0.83 - .91) produces significantly more accurate prediction of future suicide attempts compared to the same set of constructs combined with traditional multiple logistic regression (AUCs = 0.62 - 0.63). In the second talk, Dr. Jessica Ribeiro will present similar evidence from large longitudinal dataset that includes suicide decedents (502 suicide decedents; 38,290 controls). These data show that hundreds of constructs combined with machine learning (AUCs = 0.85 – 0.88) predict future suicide death with significantly greater accuracy than these same constructs combined with traditional multiple logistic regression (AUC = 0.58). In the third talk, Xieyining Huang will draw on a smaller dataset (but still large for the field; N = 917) to present similar machine learning evidence on distinguishing suicide ideators from non-ideators. The size of this dataset only permitted 48 predictors (vs. hundreds in the first two talks), but machine learning techniques still produced superior classification accuracy (AUCs = 0.73 - 0.79) compared to traditional multiple logistic regression (AUC = 0.50). In the fourth talk, Dr. Joseph Franklin will build from these findings to propose a novel theory of suicidality.

2.1 RECONCILING MACHINE LEARNING EVIDENCE, BASIC PSYCHOLOGICAL SCIENCE, AND SUICIDE: THE CONSTRUCTIONIST THEORY OF SUICIDALITY

Joseph Franklin*[1]

[1]Florida State University

A diverse array of theories about the causes of suicide have been proposed since Durkheim (1897). These theories have guided risk assessment and prevention efforts, but the ability to predict suicidal thoughts and behaviors did not improve from 1965 to 2014 (Franklin et al., 2017) and the suicide rate has never appreciably declined and has been rising since the year 2000 (CDC, 2016). This suggests the need for a new theoretical approach, but this new approach must avoid the pitfalls that have limited previous theories. One major pitfall has been the fundamental assumption contradicted by machine learning evidence described in other talks in this symposium: the assumption that the causes of suicidality should be reduced to a small number of biopsychosocial constructs. Instead, the other talks in this symposium indicate that suicide theories should be consistent with evidence that a large and indeterminate set of biopsychosocial constructs causes suicidal thoughts and behaviors (i.e., 'the complexity assumption').

In this talk, I will outline a new theory that is consistent with the complexity assumption and that draws directly from an increasingly popular approach in basic cognitive and affective neuroscience: psychological constructionism (e.g., Barrett, 2012; Barsalou, 2009). In line

with this general theory, I propose that suicidality emerges (or is constructed) from psychological primitives (i.e., irreducible properties of the mind; Barrett, 2012). Specifically, suicidality emerges from the ongoing interaction of three psychological primitives: conceptual knowledge about suicidality; core affective states associated with suicidality; and external stimuli associated with suicidality. A wide range of biopsychosocial constructs can influence these psychological primitives to cause (or prevent) suicidal thoughts and behaviors. A corollary of this theory is that parsimony is not relevant on the level of biopsychosocial constructs - it is only relevant on the level of psychological primitives. I call this new approach the Constructionist Theory of Suicidality (CTS).

A full explanation of psychological constructionism and the CTS will be given during the talk; within the space limitations of this abstract, I will note a few major implications of this theory. First, it suggests that most prior theories are partially correct as a range of biopsychosocial constructs (e.g., hopelessness) should play a causal role in suicidality. However, the CTS suggests that the roles for each construct are very small - they are neither necessary nor sufficient; rather, they represent one potential construct among hundreds of others that combine together to cause suicidality. This position is highly consistent with meta-analytic evidence (Franklin et al., 2017) and the machine learning evidence presented in this symposium. Second, the CTS implies that the goal of suicide risk research should not be to identify a circumscribed set of biopsychosocial factors as "important risk factors." That is, the goal should not be to develop risk factor lists or interviews for clinicians – these will always be inaccurate (cf. Franklin et al., 2017). Instead, a focus should be placed on developing and evaluating machine learning-based risk algorithms that have the potential to accurately detect risk on a large scale. Third, the CTS indicates that prevention efforts should broadly target psychological primitives (e.g., altering conceptual knowledge related to suicidality and its link to affective states and certain situations) rather than specific biopsychosocial constructs.

2.2 PREDICTING SUICIDE DEATH OVER TIME USING MACHINE LEARNING

Jessica Ribeiro*[1], Joseph Franklin[1], Xieyining Huang[1], Colin Walsh[2]

[1]Florida State University, [2]Vanderbilt University Medical Center

Our ability to predict suicide has been at near-chance levels since the inception of suicide research (Franklin et al., 2017). Evidence from recent meta-analytic efforts indicate that prediction is uniformly weak across risk factors, including internalizing psychopathology and prior self-injurious behaviors, which are often cited among the strongest predictors of suicide death (Bentley et al., 2016; Ribeiro et al., 2016a). These findings help to explain why rates of suicide death have been largely intractable, despite decades of research (CDC, 2016).

Given the complexity of suicidal behavior, accurate suicide risk detection will likely require the simultaneous consideration of a multitude of risk factors as well as complex combinations among those factors (Ribeiro et al., 2016b). Yet, our conventional approach to suicide prediction has typically focused on detecting risk using a single factor (e.g., hopelessness) or a small set of factors (e.g., hopelessness, depression). In part, this approach has been limited by the constraints of the traditional statistical approaches typically employed in psychiatry and psychology, which are not well-suited to meet this end. Machine learning (ML), however, is optimally-suited to address this critical need.

Beyond limitations to predictive accuracy, another major shortcoming of prior research has been the overwhelming focus on eventual death by suicide. Clinicians are typically tasked with predicting suicide risk over the course of a few days or weeks; yet, the vast majority of studies involve follow-ups of several years or decades, and virtually no studies have prospectively examined imminent risk. The average follow-up is nearly 10 years, and less than 1% of studies having follow-ups of shorter than one month (Franklin et al., 2017). Given clinical demands, this represents a critical gap in our knowledge.
The aim of the present project was three-fold. First, we applied machine learning to a large dataset of electronic health records (EHRs) to develop risk algorithms to predict suicide death. Second, we used machine learning to predict risk of suicide death over time. Third, we compared prediction using machine learning to prediction derived from conventional logistic regression.

The sample was drawn from a curated data repository of EHRs that included EHRs from over two million patients. We identified 502 suicide decedents; cause of death was verified through the National Death Index. Suicide decedents were compared to 11,774 general patient controls and 26,516 depressed controls. Multiple imputation of chained equations was applied to handle missing data. Random forest was our main ML approach. Bootstrapping was used to assess for variance and correct for optimism (i.e. guard against overfitting). For comparison, logistic regression analyses were conducted. Kolmogorov-Smirnov testing was applied to assess normality and inform direct comparisons of performance.
ML algorithms accurately predicted suicide death, with improvement in predictive accuracy as suicide death became more imminent. Prediction was strongest one week before suicide death, comparing against general patient (AUC = .88 [.85, .91]) and depressed controls (AUC = .85 [.82, .88]). Machine learning algorithms also outperformed traditional logistic regression, which produced accuracy estimates only marginally better than chance (logistic regression: .58 [.48, .67]; $p < .001$).
Taken together, these findings suggest that ML approaches have the potential to make substantive advances toward accurate and scalable suicide risk detection. As these results also speak to the temporal variance of suicide risk, they may help to inform the timing of risk detection and prevention efforts.

2.3 HARNESSING LARGE DATASETS TO MEASURE AND PREDICT RISK OF SUICIDE ATTEMPTS WITH MACHINE LEARNING

Colin Walsh*[1], Jessica Ribeiro[2], Joseph Franklin[2]

[1]Vanderbilt University Medical Center, [2]Florida State University

For decades, researchers have conducted prospective research to identify risk factors for suicide attempts. These have primarily consisted of univariate or small multivariate risk factor tests, with the aim of informing clinical practice. Unfortunately, due in part to limited accuracy and scalability (Franklin et al., 2017), this approach has not produced large-scale declines in suicidal behaviors. These patterns suggest the need to change our approach to detecting risk for suicide attempts.
In response to this lack of progress, an increasing number of data-driven efforts to classify and predict risk from healthcare data have developed. Investigators have begun to utilize data from electronic health records (EHRs), clinical trials, social media, and smartphones to create highly complex datasets that may enhance our ability to identify those at risk. In this

talk, we will describe one such effort: a collaboration between Vanderbilt University Medical Center and Florida State University that has led to an enterprise-scale research architecture built via open source software that can predict risk of suicidal behaviors in anyone who visits for routine care. We will describe a study from this collaboration that involved developing and validating models of risk of suicide attempts.

This longitudinal cohort study was built from a database of clinical EHRs reflecting two decades of care at a single academic medical center. To accurately identify suicide attempters within this database, two suicide experts coded records from all individuals who received an E950x ICD code (i.e., self-injury code). A total of 3,250 suicide attempters were identified (cases); these were compared to 2,260 non-suicidal self-injurers (NSSI controls), 8,003 patients with depression but no suicidal behavior (depressed controls), and 12,695 individuals randomly selected from the hospital database (hospital controls). Missing data were handled via multiple imputation of chained equations. A predictive machine learning (ML) framework incorporated algorithms including L1-regularized regression, random forests, and traditional logistic multiple regression. Variance assessment and optimism adjustment were conducted via bootstrapping. Normality was assessed via KS testing and informed subsequent hypothesis testing of potential algorithm performance differences.

Results revealed that ML approaches, particularly random forests, produced accurate prediction of future suicide attempts (AUCs = 0.83 - 0.91). Three general patterns emerged within these findings. First, accuracy improved significantly as the control group varied from NSSI as most severe and least accurate to general hospital controls as least severe and most accurate (NSSI controls [AUC = 0.83], depressed controls [AUC = 0.84], and hospital controls [AUC = 0.92], $p < .001$). This signal supports the increasing difficulty of discriminating risk as comparison groups share common pathology. Second, among ML techniques, random forests significantly outperformed L1-regularized regression (e.g., for hospital control comparisons, random forests [AUC = 0.92] outperformed regularized regression [AUC = 0.84], $p < .001$). Third, accuracy was consistently poor for traditional multiple logistic regression models (AUCs = 0.62 - 0.64), despite the fact that they included the same predictors as ML models.

On a practical level, these results suggest that ML applied to EHR data is an accurate and scalable method of suicide attempt risk detection. On a theoretical level, these results are consistent with the view that large, complex combinations of biopsychosocial constructs are necessary to approximate the causal processes that produce suicide attempts.

2.4 MACHINE LEARNING ACCURATELY DISTINGUISHES BETWEEN IDEATORS AND NON-IDEATORS (BUT TRADITIONAL METHODS DO NOT)

Xieyining Huang*[1]

[1]Florida State University

Suicide ideation is a major public health concern, with an estimated 8.3 million adults in the United States affected annually (Crosby, Gfroerer, Han, Ortega, & Parks, 2011). Accurate risk prediction is crucial for the provision of cost-effective prevention and treatment. Despite past research efforts, our ability to predict suicide ideation has remained around chance levels (Franklin et al., 2017). Given the complex etiology of suicidal thoughts, accurate prediction might require examining the relationships among a large number of predictors (Ribeiro et al., 2016). Machine learning (ML) is particularly well-suited for such complex problems. Specifically, unsupervised ML adopts a bottom-up approach to discover subgroups within the

data; supervised ML uses the outcomes of the existing data to train the best prediction algorithm. Using a sample of suicide ideators and controls, this study aims to evaluate: 1) whether unsupervised ML provides evidence for the existence of two distinct groups (i.e., ideators versus non-ideators); 2) whether supervised ML can accurately identify suicide ideators; 3) whether supervised ML provides superior identification compared to traditional multiple logistic regression.
The sample included 914 current firefighters who completed a survey on suicide and behavioral health. Suicide ideation status was determined using one item from the Self-Injurious Thoughts and Behaviors Interview – Short Form (SITBI-SF; Nock, Holmberg, Photos, & Michel, 2007). We performed hierarchical and k-means cluster analyses as unsupervised ML and random forests as supervised ML. All analyses were conducted in R with the MICE, randomForest, and pROC packages.

The sample was predominantly white (86.9%) and male (90.0%), with a mean age of 36.90 years old (SD = 10.78). About half of the sample (48.1%; n = 440) reported experiencing suicide ideation. The analyses included 48 predictors and one outcome (i.e., suicide ideation). Dendrograms produced by hierarchical cluster analyses provided evidence for at least two distinct subgroups in the sample. The two subgroups identified by k-means cluster analysis were consistent with participants' suicide ideation status (AUC=.72 [.70 - .75]). Random Forests algorithms produced acceptable to good prediction for suicide ideation status (AUC=.79 [.76-.83]). Traditional multiple logistic regression models that included the same 48 predictors produced chance-level prediction (AUC = 0.50 [0.49 – 0.51]).
This study suggests that both unsupervised and supervised ML can greatly improve our abilities to identify suicide ideators compared to traditional statistical methods. However, the number of predictors (i.e., 48) included in this study were considered small for ML. Future studies should examine whether including more predictors will result in even higher identification accuracy.

3. NEW UNDERSTANDING OF THE NEUROBIOLOGY OF SUICIDE AND POTENTIAL CAUSES

Chair: John Mann, Columbia University & New York State Psychiatric Institute

Overall Abstract: This symposium examines the neurobiology of suicidal behavior from a brain imaging perspective that examines neural circuitry with MRI and neurotransmitter systems with positron emission tomography. Two causes of brain pathology are also examined in terms of metabolomics and inflammation. John Mann will describe a set of trait abnormalities in the serotonin system that have their potential origins in genetic and epigenetic effects on the expression of the 5-HT1A autoreceptors which regulate firing of the serotonin neurons. These mechanisms are one explanation for how genetics and childhood adversity affect risk of mood disorders and suicidal behavior. The serotonin system changes will be linked to altered Hypothalamic Pituitary Adrenal axis function. Kees van Heeringen will describe results of multi-modal MRI and PET scanning that show altered brain neural circuitry in suicidal patients and may explain a loss of top down control and other abnormalities in social cognition. Lisa Pan will describe a patient series with treatment resistant depression who turned out to have rare metabolic diseases discovered by analyzing cerebrospinal fluid. Such an approach may detect patients at greater risk of suicide. Finally, Lena Brundin will report on potential pathogenic effects of inflammation that may alter brain function and result in suicidal ideation and behavior.

3.1 NEW NEUROBIOLOGIC IMAGING FINDINGS RELATED TO THE STRESS DIATHESIS MODEL OF SUICIDAL BEHAVIOR

John Mann*[1], Jeffrey Miller[1], M Elizabeth Sublette[2], Louisa Steinberg[1], Maria Oquendo[3], Harry Rubin-Falcone[1], Todd Ogden[1], Barbara Stanley[4], Hanga Galfalvy[2]

[1]Columbia University & New York State Psychiatric Institute, [2]Columbia University, [3]University of Pennsylvania, [4]College of Physicians & Surgeons, Columbia University

Certain traits forming the diathesis for suicidal behavior differentiate depressed suicide attempters and non-attempters after matching for psychiatric diagnosis. Suicide attempters have greater mood dysregulation and subjective distress, more pronounced reactive aggressive traits, impaired problem solving and learning, and distortion of perceived social cues (van Heeringen and Mann, Lancet Psychiatry, 2014). Part of the pathogenesis of this diathesis lies in 5-HT1A autoreceptor over-expression which in turn contributes to recurrent mood disorders, suicidal ideation, aggressive and impulsive traits, memory and learning and stress responses. A bidirectional relationship exists between the serotonin system and HPA axis function and new data will be presented linking 5-HT1A over-expression to HPA axis excessive stress responses. Brain imaging and genomic data will be shown linking 5-HT1A autoreceptor function to genetic and epigenetic factors (childhood adversity).

3.2 SUICIDE AND THE CONNECTOME

Kees van Heeringen*[1]

[1]Ghent University

Uncovering the neural basis of suicidal behavior can be expected to contribute to the understanding, detection and treatment of the vulnerability to suicidal behaviour. Postmortem and early imaging studies have identified suicide-related changes in cortical and subcortical brain areas based on which a network-based diathesis to suicidal behavior has been suggested. Advances in imaging provide the opportunity to study the brain as a complex, integrative network and its involvement in the processing of emotional responses to salient stimuli. Recent studies have focused on structural and functional network connectivity (the 'connectomic' approach) that is valuable for the study of diagnostic biomarkers and treatment evaluation. Network analyses of structural data demonstrate structural connectivity disturbances in association with suicidal behavior. Resting-state and task-dependent functional connectivity studies show abnormalities in neural circuitry implicated in emotional processing in self-harm and attempted suicide patients. While the relationship between structural and functional disturbances still is unclear, the findings suggest that functional abnormalities are related to gray and white matter deficits, which may thus lead to the maladaptive cognitive processes commonly involved in suicidal behavior. This presentation will particularly focus on structural and functional changes in a thalamocortical network in association with suicidal behaviour and their potential consequences from a computational point of view. The findings suggest that thalamocortical changes exert their effect on suicide risk via increased precision/salience of negatively valenced stimuli. There is increasing evidence of an effect of neurostimulation on these information-processing disturbances via changes in the connectome.

3.3 METABOLOMICS AND SUICIDAL BEHAVIOR

Lisa Pan*[1], David Brent[2], Gerard Vockley[3], David Peters[4], David Finegold[5], Robert Naviaux[6], Anna Maria Segreti[2], Annie Shaw[4], Sharon Nau[2], Lora McClain[2], Kaitlyn Bloom[3], Rebecca Michalec[2], Thomas Zimmer[2], Manivel Rengasamy[2], Roisin Sabol[2]

[1]University of Pittsburgh School of Medicine, [2]UPMC/ Western Psychiatric Institute & Clinic, [3]UPMC/CHP, [4]UPMC/MWRI, [5]University of Pittsburgh School of Public Health, [6]University of San Diego School of Medicine

Treatment refractory depression and suicidal behavior are devastating clinical problems with significant morbidity, mortality, and cost to society. We recently published a report of a young adult with severe, unremitting depression and multiple suicide attempts who did not respond to pharmacotherapy or electro-convulsive therapy (ECT). Further evaluation identified a severe deficiency of all cerebrospinal fluid (CSF) metabolites of biopterin, a critical cofactor for synthesis of the monoamine neurotransmitters, suggesting a variant of guanosine triphosphate (GTP)-cyclohydroxylase deficiency. Treatment with the biopterin analogue sapropterin led to a dramatic remission of his depression. In an exploratory trial triggered by this patient we have now identified evidence of underlying central nervous system (CNS) neurometabolic disorders in 41 of 85 additional patients with treatment refractory depression and suicidal behavior. Twenty-one of these patients have cerebral folate deficiency and treatment with folinic acid has resulted in reported depression symptoms in 10 of 10 with adequate follow-up. Notably, none of the current tools aimed at developing personalized strategies for the treatment of depression (e.g., functional neuroimaging or pharmacogenetics) would have identified these defects or led to effective therapy.
The goal of this presentation is to discuss the role of CNS-specific inborn errors of metabolism (IEMs) and secondary CNS-specific metabolic disorders in disease pathophysiology in individuals with a history of severe depression and suicidal behavior refractory to at least three adequate treatment trials and/or treated with ECT due to unresponsiveness to known treatments. We hypothesize that such disorders are under-recognized in this patient population. We discuss an extensive neurometabolic evaluation for these participants and whole genome DNA sequencing of treatment-refractory individuals to identify genetic variants that contribute to the metabolic disease phenotype. We discuss further directions in broad spectrum metabolomics. We hypothesize that individuals with severe treatment refractory depression will have metabolic alterations in their blood and/or CSF that are not present in participants with treatment responsive depression and healthy, matched controls. We further hypothesize that individuals with severe treatment refractory depression will harbor rare and deleterious DNA sequence variants that are associated with these metabolic alterations. Additionally, we propose that altered metabolic signatures and gene variants will provide valuable biomarkers and insights into disease mechanisms.

3.4 INFLAMMATION AND SUICIDAL BEHAVIOUR

Lena Brundin[1], Daniel Lindqvist*[2]

[1]Van Andel Research Institute, [2]Lund University Hospital

A mounting number of studies report a link between suicidal behaviour and inflammation. In our early research, we found evidence of increased levels of cytokines, in particular IL-6, in the cerebrospinal fluid of patients who recently attempted suicide. We subsequently analysed blood samples from a second cohort of suicide attempters, and found significantly elevated TNF-alpha, IL-6, and decreased levels of IL-2. These changes distinguished the suicide

attempters not only from healthy controls, but also from depressive subjects that did not display suicidal ideation or behaviour.
In order to understand the downstream mechanisms by which inflammation may affect neurotransmission, we proceeded to study the enzymatic kynurenine pathway, breaking down tryptophan and forming several neuroactive metabolites along the way. The activity of the pathway is increased by inflammatory stimuli. Of particular interest for suicidality, the metabolites quinolinic acid and kynurenic acid have direct and opposing effects on the NMDA-receptor. Interestingly, we found that the NMDA-receptor agonist quinolinic acid is increased to around 300% in the CSF of suicide attempters compared to healthy controls. Conversely, kynurenic acid levels are significantly reduced. In a longitudinal study, we followed suicide attempters for several years after an attempt, with repeated CSF and blood samples. We showed that symptoms of depression and suicidality fluctuate with the "inflammatory load" in the CSF, and the levels of quinolinic acid were continuously high, although the highest levels were obtained at the suicide attempt. Therefore, we proposed that inflammatory stimuli could be particularly detrimental for individuals with a dysfunction of certain kynurenine pathway enzymes; leading to increased production of metabolites with effects on glutamate neurotransmission; in other words a vulnerability to develop depression and suicidality upon inflammation. In subsequent studies we found evidence that a particular enzyme, regulating the production of quinolinic acid, seems to have reduced activity in two cohorts of suicide attempters, both in the periphery and in the CNS.
In parallel studies, we investigated the levels of inflammatory factors in cross-sectional populations of psychiatric patients and found that acute phase markers and cytokines correlate with fatigue and depression across diagnostic boundaries. Inflammation in certain patients may be associated with known somatic conditions, but in most individuals, it was previously unknown, without any obvious co-morbidity. Some of the underlying reasons for the observed inflammation in suicide attempters may be vitamin D deficiency, or chronic infections, such as T. Gondii., both of which we have found to be associated with suicidal behaviour in our studies.

4. MEDIA, SOCIAL MEDIA, AND SUICIDE

Chair: Merike Sisask, Tallinn University, School of Governance, Law and Society (SOGOLAS)

Overall Abstract: In suicide prevention one of the recognized public health approaches is responsible media reporting on suicidal behaviors. Associations between media portrayal and suicidal behaviors have been a subject of research for decades. There is evidence available, how irresponsible media reports can provoke suicidal behaviors (the "Werther effect"), but also how media can provide protective effect by newspaper blackout or by changing the quality and content of media reporting (the "Papageno effect"). Media is a significant agent in social construction of reality, especially for vulnerable persons.
The global medium Internet has no limits either spatially or in time and it has become the main platform of information and communication about suicide. The new media refers to content available on-demand through the Internet that is accessible online through various digital devices (computers, tablets, mobile phones). The new media includes websites, blogs, social networks etc. It normally provides interactive environment and it develops and changes rapidly. In the new media the consumers are also creators – active agents – who produce and

reproduce messages in medium, which has provided new challenges for suicide research and prevention.
Several countries and organizations – e.g. the World Health Organization, the Samaritans, and the American Foundation for Suicide Prevention – have launched and disseminated the resources to educate and empower media professionals about responsible media coverage regarding suicidal behaviors. These resources have been further developed to include also recommendations for covering the topic of suicide in social media. The recommendations have several similarities, but also peculiarities.
During the symposium, the recent trends and advances in suicide research regarding media, the Internet and social media will be presented and discussed. Theoretical, practical and methodological implications will be highlighted.

4.1 SOCIAL MEDIA AND SUICIDAL BEHAVIORS IN ADOLESCENTS

Merike Sisask*[1]

[1]Tallinn University, School of Governance, Law and Society (SOGOLAS)

Suicidal behaviors in youth are major public health problem (WHO 2014; Hawton et al 2012) and the proportion of young people using the Internet and social media on everyday basis has grown tremendously, reaching more than 90% (Eurostat Statistics Explained 2016). This leads to the interest, how social media and suicidal behaviors in adolescents are associated. Social media has been defined as "… a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user generated content" (Kaplan & Haenlein 2010). Technical evolution and expansion of mobile devices has broadened the availability and usage of social media applications. There are various types of social media, starting from text based wikis and blogs and ending with picture and video based platforms with personal profiles like Instagram and Snapchat, the most popular of them – Facebook with approx. 2 billion users – being somewhere between.
Quite a lot is already known about traditional media and its preventive vs provocative influence on suicidal behaviors (Sisask & Värnik 2012). Although all knowledge obtained about traditional media may not work in the era of social media, where readers are active agents and content creators, it is important to keep in mind that in a public health perspective the social media can also influence suicidal behavior both negatively and positively (Luxton et al 2012).
Social media platforms are popular places to express suicidal thoughts and feelings, especially among young people. Social media has been found to hold significant potential for suicide prevention due to their reach, accessibility, and non-judgmental and anonymous nature (Robinson et al 2016), although more evidence is needed to understand its safety and efficacy. Adolescents are especially sensitive to suicide contagion effect (Cheng et al 2014; Hawton et al 2012) and social media may become a platform for spreading suicidal messages, promoting suicidal behaviors and disseminating dangerous games like the "Blue Whale Game". This should be balanced by creating and spreading preventive messages.
Social media use, especially using it excessively and/or compulsively, is linked with increased levels of several mental health problems like poor sleep, depression, anxiety and suicidal ideation (Primack et al 2017; Shensa et al 2017; Levenson et al 2016; Sampasa-Kanyinga & Lewis 2015). These mental health problems are recognized risk factors for

suicidal behaviors in adolescents. Besides, addictive social media use may reflect a need to feed the ego (i.e. narcissistic personality traits) and an attempt to inhibit a negative self-evaluation (i.e. self-esteem) (Andreassen et al 2017).
The amount of information social media platforms contain is enormous and the changes in the social media landscape are rapid. Individual behavioral patterns and messages in social media can provide useful signals for detecting vulnerable individuals (De Coudhury et al 2013; Fu et al 2013) and the social media "big data" may help to address population-level suicidal behavior and mental health problems (Won et al 2013; Young et al 2014; Conway & O'Connor 2016). It is a huge challenge for researchers – how to capture and process this information in a meaningful way in order to improve understanding of suicidal behaviors and provide innovative and applicable suggestions for prevention.

4.2 SUICIDE AND THE INTERNET

Jane Pirkis*[1], Katherine Mok[2], Jo Robinson[3]

[1]University of Melbourne, [2]Black Dog Institute, [3]Orygen

Views about suicide and the Internet are quite polarised. Some people are very positive about the Internet's potential as a medium for suicide prevention. Others are adamant that the Internet can cause harm, particularly for already-vulnerable individuals who are searching for information about suicide methods. In reality, the influence of the Internet is probably much more nuanced than this; it is a volatile medium that presents a plethora of both positive and negative content to at-risk individuals who are often ambivalent about suicide and interpret these messages in a variety of ways. This presentation will summarise the evidence for these different points of view.

4.3 MEDIA AND SUICIDE: BUILDING THE EVIDENCE BASE

Thomas Niederkrotenthaler*[1], Benedikt Till[1]

[1]Medical University of Vienna, Center for Public Health, Institute for Social Medicine, Suicide Research Unit

For many years, research in the area of media and suicide has largely focused on ecological research designs using aggregate data. Although these research designs have provided important results, studies using individual data are necessary to further build the evidence base. In this presentation, specific strengths and weaknesses of various research designs as they relate to the topic area will be discussed. Particularly, examples of how various research designs can contribute to strengthen the evidence and persuade journalists and editors to follow media recommendations for suicide reporting will be presented. A main focus will be on considerations regarding how to conduct randomized trials in this topic area.

4.4 ENGAGING VULNERABLE YOUTH BY ACTIVATING THEIR SOCIAL MEDIA NETWORKS

Qijin Cheng*[1], Paul Yip[1]

[1]The University of Hong Kong

Suicide is the second leading cause of death for youth globally and has been the leading cause of death for youth in Hong Kong (HK) for decades. The recent surge of student suicides in HK has further raised public concern. Connecting vulnerable youth with caring adults, such as mental health care and support services, is imperative for youth suicide prevention.

However, previous efforts often encountered challenges because young people did not seek help from professionals or social services due to stigma or mistrust.
The presentation will report our recent findings while collaborating with social media key opinion leaders (KOLs) to engage vulnerable youth. The project team examined the KOLs' impacts, when they posted content relating to youth suicide in social media, on their followers and the network structures of their followers. We identified suitable KOLs as our working partners to co-create multi-media content for raising public awareness and encouraging help seeking. Through the KOLs, we aimed to reach out to two groups of people, those who need help and those who potentially can offer help. For those who can offer help, we engaged them with suicide prevention gatekeeper training and empowered them to work with KOLs together to provide support and referral to those who need help. By activating social media networks, the project aimed to knit an organic and sustainable safety net for vulnerable youth and improve their connectedness with professionals and social services. Evaluations on the process and outcomes of the project will be reported and future directions will be discussed in the presentation.

5. IMPROVING UNDERSTANDING OF SUICIDE RISK IN YOUTH: ANSWERING QUESTIONS OF HOW, WHO, AND WHEN

Chair: Catherine Glenn, University of Rochester

Overall Abstract: Suicide is the second leading cause of death among youth 10-19 years old. Unfortunately, despites decades of research on risk and protective factors for suicide in youth, critical gaps remain in our understanding of how risk is conferred, who may be most at risk, and when they are at risk. Answers to these questions are essential to improve effective prevention and intervention efforts. This symposium includes four presentations that aim to address these key questions of how, for whom, and when suicide risk increases among youth. Notably, this symposium will focus on research that aims to identify novel transdiagnostic risk correlates in youth (e.g., prospection, implicit suicide-related affect) and uses rigorous statistical designs (e.g., longitudinal within-person, mediation).
The first and second presentations will focus on the roles of specific cognitive and affective risk factors to identify who may be most at risk for suicide. In the first presentation, Dr. Christine Cha will examine the association between prospection (future thinking) and suicidal behavior in youth. Specifically, she will describe research that assesses how fluency and likelihood of future events relates to suicide attempts among a large sample of adolescents receiving inpatient psychiatric care. Results indicate that a tendency to imagine unlikely positive future events is associated with suicide attempt history, even after controlling for depression. These findings mark the first investigation of these cognitive mechanisms for suicidal behavior among hospitalized youth.
The second presentation from Dr. Catherine Glenn will examine how implicit suicide-related cognition (self-identification with death) and affect (fearlessness of death) relate to suicide risk in youth. Specifically, she will describe how these implicit measures relate to severity of suicidal thoughts and behaviors cross-sectionally and how they prospectively predict suicidal thoughts and behaviors over the subsequent year. Findings from this study indicate distinct patterns of suicidal thinking and affective processing among adolescents at risk for suicide.
The third and fourth presentations will examine how childhood maltreatment confers risk for suicidal thoughts and behaviors in adolescents and, in the last presentation, identify when adolescents may be most at risk. The third presentation from Dr. Elizabeth Handley will

discuss specific interpersonal mechanisms linking child maltreatment to suicidal ideation in adolescents. She will describe findings showing that higher levels of mother-adolescent conflict and higher levels of depressive symptoms are mediators of the association between childhood maltreatment and suicidal ideation among adolescent girls. This research significantly advances understanding of how maltreatment confers risk for suicidal thinking in adolescence. The final presentation by Dr. Adam Miller will focus on testing the complex interplay between abuse exposure, depression, and stress using a rigorous longitudinal, within-person design in a large sample of adolescents. Specifically, he will describe a project that tests whether fluctuations in depression and interpersonal stress over time increase vulnerability for suicide ideation and attempts among adolescent girls with and without a history of trauma. Results indicate that, consistent with the stress-sensitization literature, early experiences of abuse engender vulnerability to later episodes of worsening depression and increased interpersonal stress that subsequently increase risk for suicidal behavior. These results help clarify both how risk is conferred and, notably, when a given adolescent may be at risk for attempting suicide.

5.1 FUTURE THINKING AMONG SUICIDAL ADOLESCENT INPATIENTS

Christine Cha*[1], Donald Robinaugh[2], Richard Liu[3], Anthony Spirito[3]

[1]Teachers College, Columbia University, [2]Massachusetts General Hospital, [3]Alpert Medical School, Brown University

We know that suicidal adolescents feel hopeless about the future, but do not yet know how they think about the future. Can suicidal adolescents easily imagine possible future events? Earlier work with suicidal adults point to deficits in imagining positive (vs. negative) future events (MacLeod et al., 1993, 1997, 1998; O'Connor et al., 2008). Interestingly, more recent work shows that imagining more positive future thoughts, specifically positive future fantasies or positive intrapersonal thoughts, predict subsequent increases in depressive symptoms (Oettingen et al., 2016) and suicidal behaviors (O'Connor et al., 2015). One explanation for these recent findings may be that the tendency to imagine unlikely or fantasy-like future events (vs. likely or realistic future events) carries distinct suicide risk. Similarly, escape fantasies and its link to positive affective forecasts have been detected among suicidal young adults (Marroquín, Miranda, & Nolen-Hoeksema, 2013). The current study aims to tease apart the tendency to imagine likely versus unlikely future events among suicidal adolescents. We hypothesized that the tendency to generate more unlikely future positive events would be associated with suicide attempt history. To test this hypothesis, we assessed fluency and likelihood of future events among 118 adolescent inpatients (12-18 years, M=14.97, SD=14.97). Similar to measures previously used with suicidal adults, adolescents were instructed to list future events within 1 minute, and then later asked whether they considered each listed event to be likely or unlikely to occur in the future. From this, we generated counts of likely and unlikely future events. Preliminary results reveal that greater tendency to imagine unlikely future events was associated with suicide attempt history, OR=1.31, CI=1.07-1.61, p=.01, and remained significant after controlling for depression, OR=1.29, CI=1.05-1.59, p=.02. As expected, the tendency to imagine unlikely positive future events was associated with suicide attempt history, OR=1.23, CI=1.04-1.46, p=.01, which also remained significant after controlling for depression, OR=1.20, CI=1.01-1.42, p=.04. Finally the number of likely positive future events was not associated with suicide attempt, OR=0.96, CI=0.84-1.11, p=.61. These initial findings emphasize the importance of

considering both fluency and likelihood of imagined future events, and mark the first investigation of these cognitive mechanisms among hospitalized youth.

5.2 IMPLICIT SUICIDE-RELATED COGNITION AND AFFECT PREDICT SUICIDAL THOUGHTS AND BEHAVIORS IN YOUTH

Catherine Glenn*[1], Terry Blumenthal[2], Matthew Nock[3]

[1]University of Rochester, [2]Wake Forest University, [3]Harvard University

Suicide is the second leading cause of death in youth ages 12-19 (CDC, 2013). An important step in reducing suicide is to improve identification and prediction of high-risk adolescents. Unfortunately, current predictors of suicide risk are insufficient. A major challenge is the reliance on self-report measures of suicide risk, which are limited by a number of reporting biases. This presentation will discuss research aimed at improving understanding of the suicidal mind and predicting future suicide risk in youth through the objective examination of implicit suicide-related cognition and affect.

Participants for this study were adolescents, ages 12-19, receiving outpatient mental health treatment. Approximately 1/3 had no history of suicidal thoughts or behaviors, 1/3 had a history of suicidal thoughts but had never attempted suicide, and 1/3 had previously attempted suicide. During the baseline assessment, adolescents completed an interview assessing history of suicidal thoughts and behaviors, a measure of implicit self-identification with death/suicide (i.e., death/suicide Implicit Association Test: d/s-IAT), and a startle reflex paradigm measuring defensive responding during suicide-related images (to measure fearfulness vs. fearlessness of suicide). Adolescents were then followed up to assess suicidal thoughts and behaviors over the subsequent 12 months.

Implicit suicide-related cognition and affect were (1) significantly related to the severity and recency of suicidal behaviors at the baseline assessment and (2) significantly predicted suicide attempts over the subsequent year. (1) In terms of suicide-related cognition, implicit self-identification with death/suicide (d/s-IAT) was strongest among adolescents who had attempted suicide in the past year, $F(5, 123) = 3.82$, $p = .003$, $\eta 2 = .14$. Moreover, adolescents who reattempted suicide over the subsequent year exhibited greater implicit self-identification with death/suicide at baseline than adolescents who did not reattempt suicide over the 1-year follow-up period (Cohen's $d = 0.87$). (2) Results for suicide-related affect followed a similar pattern. Adolescents who had attempted suicide in the past year exhibited more fearlessness of suicide (i.e., smaller startle responses during suicide-related images) than any other group, $F(4, 110) = 2.28$, $p = .066$, $\eta 2 = .08$. Moreover, adolescents who reattempted suicide over the subsequent year were distinguished by the greatest fearlessness of suicide at baseline.

Findings from this study indicate distinct patterns of suicidal thinking and affective processing among adolescents at risk for suicide. Consistent with research in adults, implicit self-identification with death/suicide in adolescents appears to track state-related changes in suicide risk. The objective examination of suicide-related affect—fearlessness about suicide—is novel in youth and supports prominent suicide theories, such as the acquired capability component of the interpersonal psychological theory of suicide (Joiner, 2005). Notably, suicide-related cognition and affect were assessed with objective measures that may address limitations of self-report assessments. Future research is needed to understand how implicit suicide-related cognition and affect can be used in combination with other known risk factors to predict suicide risk over shorter time periods and at the individual level.

5.3 AN INVESTIGATION OF MOTHER-ADOLESCENT RELATIONAL PROCESSES UNDERLYING CHILD MALTREATMENT RISK FOR ADOLESCENT SUICIDAL IDEATION

Elizabeth Handley*[1], Jody Todd Manly[1], Dante Cicchetti[2], Tangeria Adams[1], Sheree Toth[1]

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Individuals who experience child maltreatment are at well-documented risk for suicidal ideation in adolescence (e.g., Miller et al., 2013 review). The Interpersonal Theory of Suicide (Joiner, 2005; Van Orden et al., 2010) posits that suicidal behavior is the result of two primary processes: 1) a perception of social isolation or thwarted belongingness and 2) acquired ability for self-injury. Indeed, much research supports the notion that interpersonal factors are robust predictors of suicidal behavior (Boardman et al., 1999; Joiner et al., 2009). Prior research has identified mental health factors, chronic pain, and general interpersonal difficulty (i.e. trouble making friends, arguments with others) as mediators in the relation between child maltreatment and suicidal ideation and behavior (Fuller-Thomson et al., 2016; Johnson et al., 2002; Miller et al., 2014). However, little is known about the specific interpersonal processes that may underlie this association, especially with regards to familial relationships. The aim of the present study was to investigate whether various aspects of the mother-adolescent relationship represent mechanisms by which maltreated girls develop suicidal ideation as adolescents.

Participants (N=177; mean age=13.99, 62.7% African-American) were from a larger randomized control trial of interpersonal psychotherapy for depression prevention among low-income adolescent girls with and without histories of maltreatment. All girls met criteria for subsyndromal or clinical depression at enrollment. Number of maltreatment subtypes was the predictor (CTQ; Bernstein & Fink, 1998), mediators were a) maternal report of mother-adolescent conflict (CBQ; Robin & Foster, 1989); b) adolescent report of mother-adolescent companionship (NRI; Buhrmester & Furman, 1985); c) adolescent report of alienation from mother (IPPA; Armsden & Greenberg, 2009); d) adolescent report of current depressive symptoms (BDI-Y; Beck et al., 2005), and the outcome variable was adolescent report of current suicidal ideation (KSADS; Kaufman et al., 1996).

The model was tested using path analysis with the weighted least square estimator with mean and variance adjustments (WLSMV) to handle the binary outcome variable. Mediation was tested using 95% asymmetrical confidence limits from RMediation (Tofighi & MacKinnon, 2011). The model showed acceptable fit to the data ($\chi 2$ (5) = 12.79 p = .03; CFI = 0.95, RMSEA = 0.09, WRMR = 0.75). The experience of greater child maltreatment subtypes was related to higher levels of adolescent depressive symptoms, mother-adolescent conflict, adolescent alienation from mother, and lower levels of mother-adolescent companionship. Mother-adolescent conflict and adolescent depressive symptoms both significantly mediated the effect of child maltreatment on adolescent suicidal ideation.

The findings indicate that among girls, child maltreatment affects multiple dimensions of the mother-adolescent relationship. Consistent with previous research, our results show that depressive symptoms mediate the relation between child maltreatment and adolescent suicidal ideation (e.g., Miller et al., 2014). Importantly, we advance the literature by demonstrating that over and above the effect of adolescent depressive symptoms, mother-adolescent conflict also represents a mechanism by which child maltreatment exerts risk for

adolescent suicidal ideation. Our results are consistent with the Interpersonal Theory of Suicide (Joiner, 2005) and highlight the importance of relationship-based interventions for adolescent girls with histories of maltreatment.

5.4 A LONGITUDINAL, WITHIN-PERSON APPROACH TO RISK FOR SUICIDAL IDEATION AND SUICIDE ATTEMPTS: EXAMINING THE ROLES OF DEPRESSION, STRESS, AND ABUSE EXPOSURE

Adam Miller*[1], Tory Esienlohr-Moul[1], Matteo Giletta[2], Matthew Nock[3], Karen Rudolph[4], Paul Hastings[5], Mitchell Prinstein[1]

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Years of previous research on adolescent suicide has examined well-known risk factors, such as depression severity and interpersonal stress, from a between person perspective. For example, it is well established that higher mean levels of depression and interpersonal stress relative to others within the same sample indicate higher likelihood of suicidal ideation and sometimes behavior (O'Connor et al., 2014). Yet, our ability to predict suicidal behavior beyond prior suicidal ideation and behavior has remained significantly limited. In the current study, we applied a within-person model informed by the stress sensitization literature (Hammen et al., 2000) to reexamine these known risk factors for suicidal ideation and behavior among adolescent girls with and without abuse histories. We expected that adolescent girls with abuse histories would be more vulnerable to fluctuations in depression and stress over time compared to those without such histories.

This longitudinal study includes data from 220 adolescent girls between 12 and 16 years old (M age = 14.69 years, SD = 1.37; 61% White). Adolescents completed baseline interviews and follow-up interviews every 3 months for 18-months. The following instruments were used: Self-Injurious Thoughts and Behavior Interview (suicidal ideation and behavior), Mood and Feelings Questionnaire (depression), Child Chronic Strain Questionnaire (interpersonal stress), Mini Neuropsychiatric Interview for Children (sexual or physical abuse history).

We constructed multilevel models examining mean levels of and fluctuations in depression and interpersonal stress as longitudinal predictors of suicidal ideation and behavior among those with and without abuse histories. These models examined the impact of an individual's mean depression/interpersonal stress (typical level for that person) as well as the impact of fluctuations (ups and downs) in these variables at each follow-up time frame relative to their own average. In addition to mean levels of depression, both higher-than-usual, within-person depression (OR = 1.99) and higher-than-usual within-person stress (OR = 1.53) predicted greater risk of suicidal ideation at each follow-up. Among girls with a history of abuse, periods of higher-than-usual within-person stress (1 SD increase) were associated with an 82% increase in the odds of suicidal behavior ($p < .05$). Similarly, among girls with a history of abuse, periods of higher-than-usual within-person depression (1 SD increase) were associated with a 57% increase in the odds of suicidal behavior ($p < .05$). These effects were not present for those without abuse histories. In a model that included both depression and stress along with their interactions with trauma, within-person fluctuations in interpersonal stress, but not within-person fluctuations depression, remained as a significant predictor of suicidal behavior.

Our results demonstrate that a within-person approach moves beyond significant limitations of past research on established risk factors for suicide. Consistent with the stress-sensitization literature, early experiences of abuse appear to engender vulnerability to later episodes of worsening depression and increased interpersonal stress on risk for suicidal behavior. Critically, our results significantly improve upon prior research by demonstrating that a within-person approach can help better categorize for whom and under what conditions

depression and interpersonal confer risk. Even more important, our results help clarify when a given individual may be at risk for suicidal behavior.

6. MILITARY AND VETERAN SUICIDE

Chair: Alan Apter, Schneiders Childrens Medical Center of Israel

Overall Abstract: This symposium deals with studies on suicide in military populations. Four presentations are included: One study looked at Crisis response planning in a military setting and showed that this was more effective than a contract for safety in preventing suicide attempts, resolving suicide ideation, and reducing inpatient hospitalization among high risk active duty soldiers. Subsequent analyses suggest that the self-management component of the crisis response plan is significantly correlated with reduced incidence of suicide attempt, which suggests that component may be especially potent. Another report concerns An Expert Panel on Suicide Prevention convened from October 23 to 26, 2016 to review current practices and make recommendations regarding the Canadian Forces Health Services (CFHS) suicide prevention strategies. Panel members included subject matter experts from Canada, the United States, the United Kingdom, and representatives from Veterans Affairs Canada (VAC). The third presentations compared different interventions for suicidal soldiers. The first intervention, Window to Hope (WtoH), was culturally adapted from the original developed in Australia. The second was a novel intervention employing Problem Solving Therapy and Safety Planning for suicide prevention (PST-SP). The final presentation looks at how suicidal adolescents fared during compulsory military service in the Israel Defense Force

6.1 FOLLOW UP OF ADOLESCENT SUICIDE ATTEMPTERS DURING COMPULSORY MILITARY SERVICE

Alan Apter*[1], Josef Levi[2]

[1]Schneiders Childrens Medical Center of Israel, [2]Ruppin Academic Center

Background: While a history of suicide attempts has been identified as the most powerful risk factor among adults, it is not clear if this is also true for the adolescent population. Our aim was to examine the differences between attempters and non-attempters in the years following a documented suicide attempt and to investigate the adolescents' prognosis in terms of suicidal behavior and adjustment.
Method: Military records at induction and during active military service were used to compare 105 adolescent suicide attempters with 105 matched controls. All were rated on cognitive/educational performance and psychosocial adaptation, psychological health diagnoses, and performance during their military service.
Results: Suicide attempters had higher school dropout rates and lower scores on educational indicators. They registered more incidents of disciplinary and adjustment problems in the military. However, the overall prognosis of the suicide attempters appeared surprisingly good. No significant differences were found between the groups in suicide risk or in behavior in their military service.
Conclusions: Attempted suicide in adolescence appears to be different in nature from attempted suicide in adulthood, and can be viewed as an indicator of social distress rather than as major risk factor of completed suicide. Implications in terms of intervention and prevention are discussed.

6.2 CRISIS RESPONSE PLANNING TO PREVENT SUICIDAL BEHAVIOR AMONG MILITARY PERSONNEL

Craig Bryan*[1], Jim Mintz[2], Tracy Clemans[3], Bruce Leeson[4], T. Scott Burch[4], Sean Williams[3], Emily Maney[3], M. David Rudd[5]

[1]National Center for Veterans Studies, [2]University of Texas Health Science Center at San Antonio, [3]National Center for Veterans Studies & The University of Utah, [4]U.S. Army MEDDAC, Fort Carson, CO, [5]National Center for Veterans Studies & The University of Memphis

Individual Abstract To evaluate the effectiveness of crisis response planning for the prevention of suicide attempts, a randomized clinical trial of active duty Army Soldiers (N=97) at Fort Carson, Colorado, presenting for an emergency behavioral health appointment was conducted. Participants were randomly assigned to receive treatment as usual (i.e., a contract for safety), a standard crisis response plan, or an enhanced crisis response plan. Incidence of suicide attempts during follow-up was assessed with the Suicide Attempt Self-Injury Interview. Inclusion criteria were the presence of suicidal ideation during the past week and/or a lifetime history of suicide attempt. Exclusion criteria were the presence of a medical condition that precluded informed consent (e.g., active psychosis, mania). Survival curve analyses were used to determine efficacy on time to first suicide attempt. Longitudinal mixed effects models were used to determine efficacy on severity of suicide ideation and follow-up mental health care utilization. From baseline to the 6-month follow-up, 3 participants receiving a crisis response plan (estimated proportion: 5%) and 5 participants receiving a contract for safety (estimated proportion: 19%) attempted suicide (log-rank chi^2(1)=4.85, p=.028; hazard ratio=0.24, 95% CI=0.06-0.96), suggesting a 76% reduction in suicide attempts. Crisis response planning was associated with significantly faster decline in suicide ideation (F(3,195)=18.64, p<.001) and fewer inpatient hospitalization days (F(1,82)=7.41, p<.001). There were no differences between the enhanced and standard crisis response plan conditions.
These results indicate that crisis response planning was more effective than a contract for safety in preventing suicide attempts, resolving suicide ideation, and reducing inpatient hospitalization among high risk active duty Soldiers. Subsequent analyses suggest that the self-management component of the crisis response plan is significantly correlated with reduced incidence of suicide attempt, which suggests that component may be especially potent.

6.3 2016 EXPERT PANEL ON SUICIDE PREVENTION IN CANADIAN ARMED FORCES

Jitender Sareen*[1]

[1]University of Manitoba

Context: An Expert Panel on Suicide Prevention convened from October 23 to 26, 2016 to review current practices and make recommendations regarding the Canadian Forces Health Services (CFHS) suicide prevention strategies. Panel members included subject matter experts from Canada, the United States, the United Kingdom, and representatives from Veterans Affairs Canada (VAC).
Objectives: The Expert panel reviewed the evidence and best practices for suicide prevention in civilian and military populations, reviewed the components of the CFHS mental health services and suicide prevention programs, considered the adequacy of the CFHS mental

health services and suicide prevention programs compared to current evidence-informed best practices, suggested specific areas of improvement for CFHS mental health services and suicide prevention efforts programs, and suggested specific areas of future inquiry that could specifically improve suicide prevention efforts.
Results: The panel learned that over the past 10 years there have been an average of 16.6 suicides deaths per year amongst Canadian Armed Forces (CAF) Regular Force and Primary Reserves combined (range 11-25), and that access and availability of mental health services for serving military personnel with suicidal behavior are greater compared to the Canadian civilian population. The panel identified numerous factors associated with suicidal behavior, but acknowledged that because suicide is a behavior, it is extremely difficult to predict at an individual level. There was agreement that although the goal is to have no suicides in the CAF Regular Force population, not all suicides can be prevented.
Recommendations: The panel identified a total of 11 suggestions for improving the approach to suicide prevention in the CFHS: 1) create a new position: Canadian Armed Forces Suicide Prevention Quality Improvement Coordinator; 2) conduct a systematic multi-disciplinary review of CAF member suicides in the last 7 years; 3) increase suicide risk assessment and safety planning training for primary care and specialty mental health care staff; 4) conduct a needs assessment with regard to training in suicide-specific psychosocial interventions for people with a history of self-harm; 5) consider implementing the Caring Contacts protocol after a mental health crisis; 6) review best practices for screening for mental disorders and suicidal behavior during recruitment, pre-deployment and post-deployment; 7) create a working group to develop optimal suicide prevention and well-being support strategies specifically for CAF members/Veterans who are in in transition from military to civilian life; 8) consider evidence-based treatments that allow for integrated, rather than sequential, treatment of addictions and mental health disorders; 9) consider options for delivery of psychological and pharmacological interventions through novel delivery methods (internet, telephone, class room) to improve accessibility for CAF members; 10) encourage safe media reporting on suicides to Canadian journalists, editors and reporters; and 11) engage patients and families in treatment and program planning.
Conclusions: The CFHS is providing the highest quality of mental health care for military personnel. The recommendations above are based on state of the art research evidence. Implementation of these recommendations will ensure that the CFHS leads the way in providing outstanding care for military personnel dealing with suicidal behavior.

6.4 TWO PROMISING EVIDENCE-BASED INTERVENTIONS FOR SUICIDE PREVENTION AMONG VETERANS WITH TBI

Lisa Brenner*[1], Jeri Forster[1], Adam Hoffberg[1], Bridget Matarazzo[1], Trisha Hostetter[1], Lindsey Monteith[1], Sean Barnes[1], Georgia Gerard[1]

[1]Veteran's Administration

US Veterans with traumatic brain injury (TBI) have higher suicide rates than members of the general Veteran population. A partnership was established between the Liverpool Brain Injury Rehabilitation Unit and the Rocky Mountain Mental Illness Research, Education, and Clinical Center to adapt and evaluate two cognitive behavioral group therapies (CBT) for Veterans with moderate to severe TBI and current hopelessness. The first intervention, Window to Hope (WtoH), was culturally adapted from the original developed in Australia. The second was a novel intervention employing Problem Solving Therapy and Safety

Planning for suicide prevention (PST-SP). For WtoH a waitlist control design was used and forty-four Veterans with a history of moderate to severe TBI and significant hopelessness (Beck Hopelessness Scale of 9 or greater) were randomized to intervention (10 week group therapy) or waitlist groups. Data was collected at three time points to facilitate evaluation of the intervention for both the intervention and waitlist groups. That is, those initially allocated to the waitlist group were also provided with the opportunity to receive the intervention after Time 2 data was collected. Feasibility of both interventions was supported by high attendance and low attrition. Quantitative data supported the acceptability of both interventions [WtoH RCT (n=33): mean CSQ-8 = 27.8, SD=4.3; PST-SP (n=13): mean CSQ-8 = 27.8, SD=4.78]. Qualitative results also supported the acceptability and feasibility of both interventions. RCT participants in the WtoH condition reported clinically and statistically significant decreases in hopelessness compared to those in the waitlist condition, after adjusting for baseline differences. Findings support the acceptability and feasibility of delivering WtoH and PST-SP to Veterans with moderate to severe TBI. Data from the WtoH RCT supported its efficacy for reducing hopelessness, a significant risk factor for suicide. Limitations included small sample size and variability in reported symptoms.

7. SAFETY AND ETHICAL CONSIDERATIONS FOR SUICIDE RESEARCHERS

Chair: Jane Pearson, National Institute of Mental Health

Overall Abstract: Background: This symposium is designed to encourage discussion and exchange among investigators on the conduct of safe and ethical research in the broad range of study designs that are used in the process of developing and implementing suicide prevention efforts. The discussion will be very pragmatic and operationally focused, with the goal of providing researchers with practical considerations related to safety and ethics that can be incorporated into study design and planning for various aspects of suicide prevention research.

Method: Crucial to the development and implementation of effective suicide prevention interventions is the encouragement of research at multiple levels: data collection on suicide risk in mental health survey research with adults and youth, clinical research efforts aiming to identify biomarkers of suicide risk, translational research to develop new interventions, efficacy research, and pragmatic trials focused on questions of effective implementation of interventions. These research efforts will be considered in a range of settings: inpatient facilities, managed care outpatient settings, community-based research, and tribal nations are some examples. Looking at the specific safety and ethical challenges that come up in all of these research designs will offer investigators a broad array of issues to consider to develop and execute strong research in this area.

Results: In the context of this symposium focused on providing guidance to researchers, the results presented are concrete and specific ideas for researchers to consider, and assess what is applicable to support the safe and ethical conduct of their research. Pearson & Siegel will present an overview of ethical and safety considerations for suicide research, and will focus on relevant federal policies, as well as new challenges presented by the use of newer technologies and social media in suicide prevention research. The presentation by Colpe & King will address strategies for encouraging non-suicide researchers to incorporate questions about suicide risk in their assessments. Ballard's presentation considers suicide research in inpatient settings, while Siegel & Pearson's discussion will address pragmatic trials of suicide prevention interventions.

Discussion: Presenting on these varied study designs and settings will allow for a rich exchange of ideas on specific and practical approaches to conducting safe and ethical research on suicide.

7.1 ETHICAL AND SAFETY CONSIDERATIONS RELATED TO SUICIDE IN PRAGMATIC EFFECTIVENESS RESEARCH

Galia Siegel*[1], Jane Pearson[1]

[1]National Institute of Mental Health

Background: With increased federal commitment to both suicide prevention and implementation research, the National Institute of Mental Health (NIMH) is supporting a number of pragmatic trials focused on suicide prevention. In addition, suicide risk assessment is part of the protocol of some pragmatic trials designed to prevent or treat mental health disorders (e.g. PTSD), as these studies often enroll participants at heightened risk of suicide. These trials present unique safety and ethical issues due to the risks presented by the study population, and the circumstances presented by conducting research in an existing community and/or health care setting.
Methods: Over the past 3 years, the NIMH has provided programmatic and operational support for a number of pragmatic trials enrolling participants at risk of suicide. These include multi-site studies (4 to 25 sites) taking place in hospital settings, trauma centers, managed care organizations, community-based care, and tribal nations. NIMH programmatic and operational involvement with these trials has allowed the Institute to identify a number of unique safety and ethical issues that can arise in the context of implementing these studies.
Results: The following issues of interest and challenges have been identified in the course of NIMH work with these trials: 1) Defining the aspects of pragmatic trials addressing suicide that lead to unique safety and ethical issues; 2) Regulatory oversight of multi-site trials with a higher risk population with regulatory bodies that more familiar with traditional clinical trial protocols; 3) Waivers and alterations of consent; 4) Reliance on programming algorithms and electronic systems for the identification of eligible participants, risk assessment, communication with study participants, and data capture and storage; 5) Adverse event ascertainment and reporting; and 6) Constraints to enhancing risk assessment and clinical management of participants due to standard operating procedures in the trial setting.
Discussion: A number of unique safety and ethical issues are presented by pragmatic trials assessing the effectiveness of suicide prevention interventions, and those studies which, at minimum, assess for suicide risk in the study population. Pro-actively considering these issues during trial planning and during pilot phases of a trial allows time for discussion and problem solving, particularly with regulatory bodies charged with protecting human subjects and providing data and safety monitoring.

7.2 SUICIDE RESEARCH IN CLINICAL SETTINGS: SAFETY AND ETHICAL CONCERNS

Elizabeth Ballard*[1]

[1]NIMH

The research literature on actively suicidal patients is relatively sparse. Suicidal patients are often excluded from psychiatric and psychological research for a host of logistical, ethical and safety concerns. These obstacles to research participation and enrollment may contribute

to the dearth of evidence for objective markers for active suicidal thoughts as well as treatments that may reduce suicide risk in the short-term. When research is conducted with suicidal individuals in clinical settings, such as inpatient units or emergency departments, additional safeguards may be required to ensure that research is conducted safely and ethically. This presentation will be a review of considerations in enrolling participants with active suicidal thoughts into research, based on experiences from the National Institute of Mental Health (NIMH) Intramural Research Program. Specifically, lessons learned will be presented from the recently initiated Neurobiology of Suicide Protocol, in which actively suicidal individuals are consented into research for both neurobiological techniques and potential rapid-acting intervention. Topics to be reviewed include the informed consent process, safety of the physical environment, delineation of research as compared to clinical care with suicidal individuals and the importance of working within clinical systems and partnering with physicians, nurses, social workers and other health care workers throughout the research process. The presentation will end with a discussion of the Failure Modes and Effects Analysis (FMEA) process that can be conducted before research begins to ensure safety of participants and communication between key personnel.

7.3 ADDRESSING THE CHALLENGES OF SAFETY AND ETHICAL CONCERNS IN NIH SUICIDE RESEARCH

Jane Pearson*[1], Galia Siegel[1]

[1]National Institute of Mental Health

Individual Abstract The National Action Alliance for Suicide Prevention is a US public-private partnership of federal agencies, state governments, private sector companies, and national suicide prevention advisory and advocacy groups, aimed at reducing the US suicide rate by 20% in 10 years. The Action Alliance published the 2012 National Strategy for Suicide Prevention (NSSP), including among its goals (Goal 12) the need to prioritize research through a new agenda for research to reduce suicide. NIMH, as the federal lead on the Research Prioritization Task Force (RPTF), developed a Prioritized Research Agenda for Suicide Prevention. The Agenda identifies research gaps, such as limitations in understanding of the etiology and course of suicidal ideation and behavior, the need for new interventions specifically targeting suicide, better matching of existing treatments to individual needs, and implementation of effective suicide prevention practices.

Safety and ethical concerns arise across all these areas of suicide research. With NIH funding, investigators must consider how suicide research meets requirements of relevant federal policies. Examples of recent updates to relevant policies include: a January 2017 update to the Federal Policy for the Protection of Human Subjects (the Common Rule); a new NIH Office of Extramural Programs human subjects research guidance website; for multi-site clinical trials, the newly published NIH policy on the use of single IRBs; and a new NIH policy establishing the expectation that all NIH awardees funded to conduct clinical trials receive Good Clinical Practice training.

New challenges are ongoing, as technologies make it easier to gather large amounts of data, web-based studies conducted without direct patient consent, 'wearable' devices, and social media. In addition, NIMH is invested in supporting data sharing, and for suicide research where suicidal behavior is a low base rate event, both data sharing and longitudinal follow up can enhance original research aims. In addition to highlighting some federal policies affecting suicide research, this presentation will include examples of approaches to: managing risk in web-based and social media studies, data sharing intent, longitudinal

follow-up for informed consent processes and unique informed consent considerations for suicide prevention studies, and specific factors to consider in planning end of study participation.

7.4 SAFETY AND ETHICAL CONSIDERATIONS WHEN INCORPORATING SUICIDE ASSESSMENT IN NON-SUICIDE RESEARCH

Cheryl King*[1], Galia Siegel[2], Jane Pearson[2], Lisa Colpe[4]

[1]University of Michigan Medical School, [2]National Institute of Mental Health, [4]NIH/NIMH/DSIR

Background: Supporting non-suicide researchers in thinking through the safety and ethical considerations of including suicide risk assessments in their data collection is critical to building the knowledge base needed to develop effective suicide prevention strategies. As such, researchers in the field of suicide prevention, and others committed to lowering the suicide rate, strongly encourage investigators in other fields of mental health research (and non-mental health research, when appropriate) to incorporate questions about suicide risk in their assessments with study participants. Research teams are often reluctant to incorporate questions about suicide in their assessments, especially in research with youth, as they are concerned about providing appropriate follow up to individuals who endorse some level of suicide risk. Suicide researchers can serve as consultants to these investigators to provide practical guidance on what procedures need to be in place when asking study participants about suicide (King, 2016).
Methods: Identification of possible barriers to asking about suicide risk in a broader range of mental health, and non-mental health, research studies, and elaborating possible solutions to address those barriers.
Results: There are three common barriers to including suicide risk assessment in-suicide studies (King, 2016). The first is concern that asking about suicide may exacerbate risk. Data on this question indicates that asking about suicide does not exacerbates risk (Gould et al 2005). Moreover, if the assessment is conducted in a sensitive way and a risk management protocol is in place, it is possible to conduct ask these questions safely and ethically. The second barrier is concern about the provision of appropriate clinical management to study participants who endorse suicide risk. Helping researchers who are not in the field of suicide prevention identify specific and clinically appropriate options for risk management can address this concern (e.g., when is providing crisis line information sufficient versus a "warm transfer" to a crisis line). In this arena, providing guidance about responding to youth risk is especially important. A third barrier involves concern about additional resources that might be needed by a study in order to incorporate suicide risk questions in a safe and ethical way. A solution for this barrier could involve experienced researchers sharing information about the costs associated with training staff appropriately, and with providing needed clinical management (i.e., setting up a contract with a crisis line to do warm transfers).
Discussion: Increasing the pool of mental health and non-mental health researchers who study suicide through added value research will advance our understanding of how to more effectively lower the suicide rate. Concerns and barriers to conducting suicide assessments in a broader range of studies are real, but they can be addressed with consultation, a systematic risk management strategy, and some incremental resources.

8. RECENT FINDINGS ON THE BIOLOGICAL UNDERPINNINGS OF SUICIDE USING POSTMORTEM HUMAN BRAIN

Chair: Etienne Sibille, University of Toronto / CAMH

Overall Abstract: Studies in human postmortem brain samples of suicide completers compared to non-psychiatric control subjects who died from natural causes have provided critical insights into the cellular and molecular basis of suicide. Evidence suggests the engagement of a complex set of molecules and pathways with both unique and shared pathologies across specific categorical neuropsychiatric disorders such as major depression, or with risk factors associated with a diathesis of suicidal behavior and completion such as stress. In this symposium, four lead researchers of human postmortem brain will present recent updates on their research with a focus on suicide and associated risk factors or comorbid conditions.

Dr. Victoria Arango will present updates on her research on serotonin, stress and suicide. Dr. Yogesh Dwivedi will present recent data on the regulation of the TNF-α gene regulation through epigenetic and genetic mechanisms in the brain of depressed and suicide individuals. Dr. Greg Ordway will discuss recent evidence of a role of DNA base excision repair enzymes in brain pathology associated with chronic stress, major depression and suicide. Finally, Dr. Etienne Sibille will present on human postmortem and translational preclinical studies investigating the role of GABA dysregulation in cognitive deficits related to depression and suicide.

Overall, this symposium will provide a comprehensive overview of recent findings in human postmortem brain that are critical in etiopathogenesis of this devastating disorder and its associated risk factors.

8.1 BRAIN SEROTONIN AND STRESS IN SUICIDE

Victoria Arango*[1], Suham A. Kassir[1], Mihran J. Bakalian[1], John Mann[2], Mark D. Underwood[2]

[1]NYS Psychiatric Institute, [3]Columbia University & NYS Psychiatric Institute

Suicide is a severe and abnormal response to stress. Suicide has a biological component. It is the result not only of the necessary biological vulnerability, but also of multiple other factors that must converge to elicit the behavior. These factors include stressful experiences, such as exposure to early adversity, genetic and epigenetic mechanisms, as well as psychopathology. We have examined serotonin transporter, 5-HT1A and 5-HT2A receptors in over two hundred brains using quantitative receptor autoradiography and over fifty brainstems, in particular detailed studies of the dorsal raphe nucleus, the source of serotonin for the forebrain. We present a model, with suicide as the outcome, based on a stress-diathesis model, but including vulnerabilities and protective factors to reflect the complexity of suicide behavior.

The serotonergic system is exquisitively sensitive to the effects of stress, and reduced serotonergic function has long been considered a hallmark of suicide behavior. Individuals exposed to early life adversity (before 15y of age) have more 5-HT1A and 5-HT2A receptors in several prefrontal regions, and suicides have more adverse events than nonsuicides. Suicides have more serotonin neurons, more serotonin synthetic enzyme (TPH2) and more TPH2 mRNA compared to controls. Rats subjected to restraint stress exhibit the same effects on the brainstem serotonergic system.

We propose that in suicide there may be a circuit “disconnect” between the brainstem and the prefrontal cortex; the brainstem shows “upregulatory" changes not communicated, either anatomically and/or functionally, to the prefrontal cortex (PFC). The end result is reduced 5-HT neurotransmission in PFC regions mediating behavioral inhibition and the outcome is the enabling of suicidal behavior. Moreover, the increase in 5-HT in the brainstem may result in a serotonergic “storm” which is reported to elicit behavioral aggression and impulsivity in animals. One implication of this disconnection is that treatments bringing about increased 5-HT synthesis may fail because the brainstem neurons synthesizing the 5-HT are not “connected” to the prefrontal cortical areas where the 5-HT is released.
Because of the anatomical abnormalities in the serotonergic system in the brain of suicides, a combination of pharmacotherapy and psychotherapy may be most effective in preventing the behavior.

8.2 A COMPLEX EPIGENETIC SWITCHING IS CRITICAL FOR TNF-A EXPRESSION UPREGULATION IN PREFRONTAL CORTEX OF SUICIDE SUBJECTS

Yogesh Dwivedi*[1]

[1]University of Alabama at Birmingham

Recently, pro-inflammatory cytokines have received considerable attention for their role in suicidal behavior; however, the results are divergent. Moreover, how the expression levels of inflammatory genes are regulated, is not clearly understood. Present study was undertaken to examine expression alteration and underlying mechanisms of the critical cytokines TNF-α dysregulation in brain of suicide individuals. TNF-α expression was examined in suicide subjects with various psychiatric disorders including MDD. Likewise, expression status of six putative microRNAs targeting TNF-α was determined including miR-19a-3p. Interaction between miR-19a-3p and TNF-α was tested using in vitro assays and possibility of their in vivo binding was interrogated in suicide frontal cortex. Expression of TAR-RNA binding protein (TRBP) was determined using qRT-PCR. The effect of HuR protein on TNF-α expression was examined with various in vitro and in vivo approaches including luciferase assay and RNP-IP analysis in post-mortem brain. Genotyping of three polymorphic nucleotides were done in seed sequence of miR-19a-3p and 3’ untranslated region (UTR) TNF-α gene based on Sanger method. Promoter methylation of TNF-α was demonstrated using MeDIP assay. As peripheral biomarker, expression status of miR-19a-3p and TNF-α were determined in blood mononuclear cells of suicidal patients. TNF-α expression was significantly high in suicide and MDD-non suicide brain. However, among five other miRNAs, miR-19a-3p was significantly induced only in suicide brain. The similar expression upregulation for both TNF-α and miR-19a-3p were noted in PBMC of suicidal patients. Despite its ability to directly target TNF-α in vitro, miR-19a-3p showed a weaker interaction in suicide brain. Interestingly, in suicide brain HuR was found to stabilize TNF transcript by sequestering its 3’UTR from miR-19a-3p inhibition. Furthermore, decreased TRBP expression supported reduced interaction between miR-19a-3p with TNF-α in suicide subjects. Additionally, TNF-α transcriptional upregulation was supported with promoter hypomethylation status in suicide brain. However, genotyping of individual polymorphic loci present at miR-19a-3p seed and UTR of TNF-α was unable to establish as genetic risk factor association. The study provides new mechanistic insights into the regulation of TNF-α gene at both transcriptional and post transcriptional level. The complex epigenetic switch behind the regulation could be critical in the etiopthogenesis of suicide.

8.3 THE STUDY OF OLIGODENDROCYTE PATHOLOGY USING POSTMORTEM TISSUE FROM BRAIN DONORS REVEALS UNIQUE TARGETS FOR THE DEVELOPMENT OF NOVEL ANTIDEPRESSANTS

Gregory Ordway*[1], Attila Szebeni[1], Liza Hernandez[1], Katalin Szebeni[1], Jessica Crawford[1], Michelle Chandley[1], Katherine Burgess[1], Craig Stockmeier[2], Westley Ongtengco[1], Hui Wang-Heaton[1], Jacob Coulthard[1], Russell Brown[1]

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Oligodendrocytes are predominately found in white matter of the brain, but also populate gray matter regions. Although commonly known to provide myelination of neuronal axons, these cells serve numerous other functions in the brain. A unique property of oligodendrocytes is their inherent susceptibility to oxidative stress because of several biochemical characteristics of these cells, including a high concentration of iron, high metabolic rate, and low antioxidant enzyme activity. Oxidative stress conditions are produced by inflammation, and both inflammation and oxidative stress are highly associated with major depressive disorder (MDD). Hence, the study of oligodendrocytes in the brain in MDD readily provides access to molecular mechanisms engaged by oxidative stress conditions that putatively contribute to the etiology of MDD. My laboratory studied oligodendrocytes, and other white matter cells, from postmortem tissue collected from brain donors that died as a result of suicide and other causes, focusing on those donors who had at the time of death either MDD or no psychiatric or neurologic diagnosis (controls). White matter oligodendrocytes or whole white matter in limbic brain from MDD/suicide donors demonstrated indices of elevated oxidative damage, including increased DNA oxidation, shortened telomere DNA, reduced expression of antioxidant enzyme genes, and upregulated DNA base excision repair enzymes. These abnormalities were either not observed or were only modestly evident in astrocytes collected from white matter of the same MDD/suicide donors. To determine whether this oxidative damage was restricted to white matter in the limbic brain, oligodendrocytes were captured from three other brain regions, prefrontal cortical (BA 10) white matter, occipital cortical white matter, and gray matter in the region of the brainstem locus coeruleus. Shortened telomeres and reduced expression of antioxidant enzyme genes were observed in oligodendrocytes from these additional brain regions in MDD/suicide. Since this oligodendrocyte pathology was not anatomically restricted to the limbic brain, it may be difficult to understand how it is relevant to the biological basis of emotional behaviors that are specifically associated with MDD or suicide. However, the oligodendrocyte is highly susceptible to oxidative stress; hence, the oligodendrocyte can be viewed as a "canary in the coal mine" for detecting oxidative damage to the brain. Therefore, elucidation of the molecular pathways activated by oxidative damage in these cells could reveal novel targets for the development of drugs to prevent oxidative damage and its subsequent pathological activation of downstream pathways deleterious to brain cell health. As such, drugs targeting these pathways may have antidepressant properties in humans, and could provide an alternative approach to treating depression and reducing suicide risk. In fact, we found that repeated exposure of rats to psychological stress increased DNA oxidation in prefrontal cortical white matter. Furthermore, preliminary findings using rat models of depression reveal that interruption of pathways downstream to oxidative damage produces a robust antidepressant response, correcting depressive-like behaviors elicited by psychological stress. These findings strongly implicate a role of oxidative damage in the etiology of MDD and possibly suicide, and demonstrate the utility of studying brain pathology as a logical path to identifying novel antidepressant targets.

8.4 THE ROLE OF SST GABA NEURONS IN INFORMATION PROCESSING: IMPLICATIONS FOR DEPRESSION AND SUICIDE

Etienne Sibille*[1]

[1]University of Toronto / CAMH

The functional integration of external and internal signals forms the basis of information processing and is essential for higher cognitive functions. This occurs in finely-tuned cortical microcircuits whose functions are balanced at the cellular level by excitatory glutamatergic pyramidal neurons and inhibitory γ-aminobutyric acid (GABA) interneurons. Balance of excitation and inhibition across biological levels, from cellular processes to network activity, reflects brain homeostasis that is characteristically disrupted in multiple neuropsychiatric disorders, including major depressive disorder (MDD), bipolar disorder, anxiety disorders, and schizophrenia, including in subjects who died by suicide.
Results from human postmortem brains demonstrate molecular changes affecting SST-positive GABA neurons in MDD. In this presentation I will review data from our group showing reduced SST expression in various brain regions in subjects, reduced SST expression per cell, rather than missing cells and the identification of critical upstream contributing factors (stress, BDNF, aging and sex). Using mouse genetics, we also show that low SST and reduced SST-positive GABA neurons have causal roles in generating illness symptoms and are targets for novel antidepressant modalities. Specifically, we show that mice lacking Sst exhibit elevated behavioral emotionality, high basal plasma corticosterone and reduced gene expression that recapitulate behavioral, neuroendocrine and molecular features of human depression. Using laser-capture microdissection, we show that cortical SST-positive interneurons display greater transcriptome deregulations after chronic stress compared to pyramidal neurons, potentially due to altered proteostasis.
Advances in cell type-specific molecular approaches and mouse genetics have now contributed to elucidate several important roles for SST interneurons in cortical processing (regulation of pyramidal cell excitatory input) and behavioral control (mood and cognition). Hence, since the function of SST-positive GABA neurons is mediated by post-synaptic GABA-A receptors containing the alpha5 subunit, we recently tested the therapeutic potential of boosting Alpha5-mediated GABA function (through positive allosteric modulation, PAM). We now show that various novel molecules with alpha5-PAM activity improve cognitive function and/or have predictive antidepressant activity at baseline and after chronic stress. Together the data suggests a role for altered SST cell function and associated processing of information at the cortical microcircuit level in cognitive function, possibly leading to rumination and suicidal ideation. This model may explain the presence of suicidal ideation as a by-product of microcircuit cellular pathology that is common across disorders, supporting its widespread co-morbidity across disorders.

9. OPTIMIZING CAPACITY FOR SUICIDE SURVEILLANCE TO SUPPORT U.S. PREVENTION EFFORTS

Chair: Cynthia Claassen, JPS Healthcare Network

Overall Abstract: A well-coordinated network of surveillance tools designed to generate high-quality, actionable data on suicidal events would substantially increase capacity for effective suicide prevention efforts in the United States. The National Action Alliance for Suicide Prevention's Data and Surveillance Task Force (DSTF) conceptualizes an

"optimized" surveillance network as one capable of supporting multiple functions, including: a) routine, multi-platform surveillance of suicide events and key drivers of suicide-related trends, b) longitudinal, multi-source data production in support of broad-based burden calculations, c) real-time detection of fluctuations in self-harm rates, and d) provision of a sophisticated and innovative data foundation for suicide prevention initiatives. Although aspirational in nature, many aspects of the DSTF vision are well within reach. This symposium will: 1) characterize the existing state of suicide surveillance data and identify key advancements needed to support national suicide prevention goals, 2) showcase innovative ways in which data generated from existing surveillance tools are being adapted to better inform suicide prevention activities, and 3) discuss next steps in optimizing surveillance capacity.

Current national surveillance capacity as it is available to support large-scale suicide prevention efforts will be examined by Jane Pearson and Michael Schoenbaum of the National Institute of Mental Health. They will discuss limitations and opportunities for improvement in the surveillance network in the context of a recently-mounted national prevention initiative, called Goal 2025, which will require substantial, high-quality input data to "bend the curve" on rising suicide rates. The three remaining presentations will illustrate how existing surveillance structures can be optimized to generate high-quality, practical data. Centers for Disease Control and Prevention (CDC) Behavioral Scientist Kristin Holland will discuss the potential contributions of a syndromic surveillance program capable of monitoring self-harm rate fluctuations in real-time, as well as a process for adapting this tool to track ED-treated self-harm events. Next, enhancements made to the Colorado Violent Death Reporting System CoVDRS in order to better inform community-level prevention programs throughout the state will be presented by Colorado State Registries and Vital Statistics Branch Manager, Kirk Bols. Powerful geocoding strategies have been embedded in CoVDRS data in order to enrich context for death in the dataset. Finally, Joseph Logan, CDC Behavioral Scientist and Epidemiologist, will illustrate the ways in which linked surveillance data generated via multiple data generating tools can support mixed-method analyses to suggest prevention targets and inform other intervention decisions.

Ideally, the "optimized" suicide surveillance network would primarily utilize existing data collection tools and coding protocols. Thoughts about how such a network could be fashioned out of these resources to strengthen the knowledge base supporting the nation's suicide prevention activities will be woven throughout each presentation.

9.1 THE UTILITY OF AN ED-BASED SYNDROMIC SURVEILLANCE SYSTEM IN MONITORING NONFATAL SUICIDE ATTEMPTS

Kristin Holland*[1], Michael Coletta[1], Cynthia Claassen[2], Michael Schoenbaum[3], Nimi Idaikkadar[1], Aaron Kite Powell[1], Scott Proescholdbell[4], Alexander Crosby[1]

[1]Centers for Disease Control and Prevention, [2]JPS Healthcare Network, [3]National Institute of Mental Health, [4]North Carolina Department of Health and Human Services

Suicide is the tenth leading cause of death in the U.S., and in 2014, almost half a million people with self-inflicted injuries were treated in U.S. emergency departments (EDs). Not only is self-inflicted injury a major cause of morbidity in the U.S., but it is also one of the best predictors of suicide. Given that approximately 40% of suicide decedents visit an ED in the year prior to their death and that the majority of medically-serious intentional self-harm

patients are treated in EDs, they serve as a critical setting in which to monitor rates and trends of suicidal events.
To date, the majority of data used to describe ED visits related to self-inflicted injuries are generally two to three years old and can only be used to describe historical patterns in suicidal behavior. In an effort to better monitor recent trends in medically treated suicidal behavior, the Action Alliance's Data and Surveillance Task Force (DSTF) has set a goal to facilitate implementation of a real-time surveillance system capable of identifying acute fluctuations or other changes in patterns of ED-treated nonfatal suicidal acts at local, state, regional and national levels.
The CDC's National Syndromic Surveillance Program (NSSP) has been collecting syndromic data from EDs in near real-time since 2003 and has been identified as a resource that can help the DSTF achieve its goal. The system captures close to 65% of all ED visits in the U.S., and national prevalence estimates can be derived for ED visits related to various health outcomes, including nonfatal self-inflicted injuries dating back to 2012 using denominator data from the American Hospital Association survey. Chief complaint narrative and ICD code data flow into the system in some cases on an hourly basis from 47 U.S. state or local health departments. These data paint a picture of ED presentations over the prior 24 to 48 hours, thus allowing the system to produce near real-time information on patterns of visits associated with nonfatal self-inflicted injuries presenting in EDs across the U.S. These data may be used to detect deviations from typical patterns of self-harm and can help drive public health response if atypical activity, such as geospatial or temporal clusters of nonfatal self-inflicted injuries, is observed.
This presentation will: a) describe the process for collaborating with the NSSP Community of Practice to obtain and use meaningful, real-time data on ED visits associated with suicidal acts, b) present recent data on trends in nonfatal self-inflicted injuries observed in a sample of U.S. EDs, and c) demonstrate the utility of NSSP data in improving situational awareness of nonfatal self-inflicted injuries in the areas included in this study.

9.2 GOAL 2025: HOW WILL WE GET THERE?

Jane Pearson*[1], Michael Schoenbaum[1]

[1]National Institute of Mental Health

In January 2017, the National Action Alliance for Suicide Prevention (Action Alliance), the public-private partnership working to advance the National Strategy for Suicide Prevention (NSSP), and the American Foundation for Suicide Prevention (AFSP), the nation's largest suicide prevention organization, united efforts to reduce the annual suicide rate 20 percent by 2025 in response to the rising suicide-related deaths over the last several decades. NIMH, as a partner of the Action Alliance, fully supports this goal, and is engaged in modeling intervention approaches that are potent pathways to suicide reductions. Building off earlier modeling by the Action Alliance's Research Prioritization Task Force to identify needed research most likely to reduce the US burden of suicide, the 2025 goal considers effective suicide prevention efforts in 4 areas estimated to result in the largest suicide reduction benefits: Improved suicide prevention efforts in emergency departments (EDs), large health care systems, criminal justice settings, and in the firearms industry and owner communities. In modeling the first 3 approaches, assumptions about 'caseness' are made—to what degree are at-risk individuals accurately identified; and assumptions about response (e.g.,

acceptability, degree of response, durability of response) to interventions are also made. Research continues to refine risk identification and intervention approaches.
Just as important, however, is the accuracy of the rate of defined suicidal behavior in these settings within specific time periods. In conducting models, it becomes quickly evident that the lack of timely US mortality (e.g. method of death), and lack of healthcare data linkage to vital statistics, severely limits US efforts to know where actual burden and prevention needs are in a timely manner, both at a state and national level. Progress in more rapid vital statistics access has been made. However, because suicide prevention requires addressing the prevention of non-fatal attempts and ideation, surveillance data on ideation and attempts must also be timely, of high quality, and tracked. Having this data available for quality improvement efforts in health care and justice system settings provides the necessary feedback loop for continued progress. The Action Alliance Data and Surveillance Task Force (DSTF) has taken these challenges on. Using the ED setting as an example, DSTF efforts are guiding suicide prevention efforts through accurate injury coding within EMRs, protocol development that enhances the sharing of data within health care systems, as well as linkage to state and national vital statistics. Examples of state efforts with high quality attempt reporting will be presented. These essential foundational elements form the basis for the research refinements in ED risk detection or screening approaches, brief interventions and triage, and transition to appropriate care.

9.3 GEOMAPPING THE NATIONAL VIOLENT DEATH REPORTING SYSTEM FOR COMMUNITY PREVENTION EFFORTS

Kirk Bol*[1], Ethan Jamison[1]

[1]Colorado Department of Public Health and Environment

Since 2004 Colorado has been collecting enhanced data on suicide deaths through participation in the CDC's National Violent Death Reporting System (NVDRS). The Colorado Violent Death Reporting System (CoVDRS) aims to be an ally for violence prevention efforts through the collection, analysis and dissemination of timely, high quality and locally-relevant suicide data and statistics to local, state, and national suicide prevention partners and the communities they serve.
In this system, Colorado's vital statistics system is routinely queried to identify all suicides that occur in the state. For each of these events, coroner, medical examiner and law enforcement reports are requested from the respective investigating agencies. The information found in these supplemental materials complement that from death certificates, providing valuable information about circumstances surrounding these deaths, toxicological results, and detailed geographic information concerning decedent's residence and location of injury. This information is abstracted into a web-based data system hosted by the Centers for Disease Control and Prevention (CDC). Additional value is added to these data through geocoding, and specifically assigning accurate and high resolution geographic identifiers to facilitate the study of suicide deaths at county and sub-county levels, including municipalities, neighborhoods, ZIP code and other census-based geographies.
Utilizing geocoded data, the CoVDRS has developed resources and provided information for use in exploring suicide deaths at the community level. One specific innovation is a data dashboard that was created by CoVDRS and allied staff, designed to be utilized by community level suicide prevention experts. The dashboard uses highly interactive functionality to allow prevention experts to explore the trends in suicide deaths in their

communities. This includes assessing the most prevalent precipitating circumstances and toxicological finding among victims of suicide and how they vary across Colorado's communities. Specific populations of interest include youth, working age and older adults in urban, rural, and mountain communities across the state; veterans; those who are divorced or widowed; those with past or current problems with the law; those who have recently engaged the health care system; and those engaged in Colorado's myriad occupations and industries. In conclusion, success in suicide prevention must include community-level interventions and prevention. However, such efforts must be informed by locally-relevant data about where and among whom suicides occur and their precipitating circumstances. The CoVDRS endeavors to incorporate and maintain accurate and high-resolution informative suicide data, and to provide tools and resources to use these data in support of these suicide prevention activities. The efforts to explore new ways to share data, may open opportunities to incorporate more data from a broader network of suicide surveillance activities. This will prove invaluable in ongoing work towards a coordinated network of data that supports the goal of suicide prevention.

9.4 INNOVATIONS IN BRINGING MULTI-SOURCE SURVEILLANCE DATA TO SUICIDE PREVENTION PRACTICE

Joseph Logan*[1], Adam Walsh[2]

[1]Centers for Disease Control and Prevention, [2]Department of Defense Suicide Prevention Office

The limitations of poor-quality and incomplete data on suicidal events are so familiar to suicide researchers that obvious gaps in understanding these acts often go without discussion. At present, critical knowledge gaps remain within all of the following domains, among others: risk detection and prediction, impact and interaction of multilevel (biological, psychological, social) risk and protective factors, longitudinal, dynamic nature of risk, impact of social group on risk. Limited data availability and poor data quality hamper efforts to mount and evaluate effective prevention initiatives.

To begin to address these challenges, efforts have been made to link existing data sources, such as National Violent Death Reporting System (NVDRS) and Department of Defense Suicide Event Report (DoDSER) data, to combine rich qualitative and quantitative information to help shed light on the etiology, epidemiology, and circumstances related to suicide events. Further, advances in technology have allowed for data elements from these and other sources to be used in novel ways, which improve our suicide prevention knowledge base. For example, NVDRS data have been geocoded to map decedent characteristics and to identify county-level distribution of suicides among military and Veteran suicide decedents. When combined with data from additional sources, military installation and potential intervention sites were also mapped, highlighting the fact that various potential intervention sites were identified in counties shouldering the highest suicide burden.
The coordination of multi-source data can be used to inform and evaluate prevention efforts. For instance, given that the majority of suicides among active duty service members involve firearms, one potential strategy to reduce suicides among this population may be to implement safe firearm storage practices. Data from a sophisticated, multi-source surveillance network could also be used to evaluate such a strategy. For instance, conducting a national multisite (multi-installation) time series or multiple baseline study would be useful

in examining the impact of safe firearm storage policies among military personnel on outcomes such as suicide and suicide attempts (assessed by the DoDSER). NVDRS may also be used to enhance the outcome measures to include other forms of violence, such as homicide. Further, linkage of suicide narratives recorded in DoDSER and NVDRS could allow for qualitative analyses on the events to help place the use of firearms and precipitating biopsychosocial circumstances in context and examine which circumstances are not commonly impacted by safe storage policies. Finally, data culled from other data sources (e.g., the Department of Veterans Affairs) could provide information on the extent to which additional preventive intervention services were available to suicide decedents and suicide attempt survivors.

Without investment to improve the scope and availability of high-quality, linkable, data, advancements in suicide prevention efforts will be less robust and slower to materialize. The multi-layered factors that influence risk necessitate improved research design and analytic approaches to identify and characterize the most influential drivers of these behaviors. Strengthening capacity within the suicide prevention workforce to work with higher quality and more sophisticated analytics will help ensure that new knowledge translates quickly into improved ways to understand risk and prevention of suicidal acts.

10. INNOVATIONS IN IDENTIFYING SUICIDE RISK VIA ACTUARIAL METHODS

Chair: Michael Schoenbaum, National Institute of Mental Health

Overall Abstract: Timely identification of individuals with near-term suicide risk is essential for targeting prevention and treatment efforts. Individual self-report, and clinician assessment, of acute suicide risk are currently the most common methods of case identification. While indispensable, at a population level these methods leave the majority of cases unidentified, and thus outside the reach of focused clinical interventions. Several recent studies have demonstrated the feasibility of using actuarial methods to identify subgroups within a larger population who have substantially elevated average suicide risk – many times the population's base rate – based on prospective statistical analysis of their characteristics and experiences, as observed via electronic health records and other administrative data sources. Moreover, available evidence suggests that most of the individuals identified with high predicted suicide risk via actuarial analyses have not already been so identified via traditional clinical decision rules. Such actuarial risk prediction can complement traditional clinical case-finding methods, identifying individuals who, at minimum, warrant suicide-focused clinical assessment.

We will present findings from suicide risk prediction research conducted in diverse health systems in the US, serving civilian and military/veteran populations. We will discuss data requirements and analytic methods, as well as practical and ethical considerations for using the results of actuarial risk prediction on a production basis to help target suicide prevention and treatment interventions.

10.1 USE OF PREDICTIVE MODELING TO TARGET SUICIDE PREVENTION IN THE US DEPARTMENT OF VETERANS AFFAIRS

Ira Katz*[1]

[1]US Department of Veterans Affairs

It has been over a decade since the Department of Veterans Affairs (VA) began enhancing its mental health and suicide prevention programs. Although suicide rates for patients utilizing VA health care services have decreased relative to other Veterans and other Americans, they remain high. For VA, this has represented a call to action for expansion of activities in suicide prevention. One new strategy, REACH-VET, uses predictive modeling based on information from the electronic medical record to identify patients at risk for suicide and to target enhancements in care. It is being implemented with an initial focus on patients at high risk, the highest 0.1% at each facility. Only 30% of these patients had been identified as being at high risk on clinical grounds. The top 0.1% is at 24 times the risk of the overall VA patient population over 3 months. They are also at 8 times the risk for non-suicide external-cause mortality, 1.5 times for non-suicide all-cause mortality, and 136 times for suicide attempts. There exhibit a 90 fold increase in mental health bed days of inpatient care and a 6 fold increase in other inpatient days. Thus, the patients are at risk for a range of negative outcomes. The REACH-VET program is disseminating information about these patients to facilities and clinicians on a regular basis to cue clinical outreach, (re)evaluation of clinical status, review of treatment plans, guidance about expedited access to mental health services at times of need, and other enhancements. Plans are to expand REACH-VET to address the patients at more moderate risk who account for a substantial component of the burden of suicide and to extend the model to include additional sources of information.

10.2 DEVELOPING CLINICAL DECISION SUPPORT TOOLS FOR SUICIDE PREVENTION

Ron Kessler*[1], Matthew Nock[2], Bossarte Robert[3], Robert Ursano[4], Murray Stein[5]

[1]Harvard Medical School, [2]Harvard University, [3]West Virginia University, [4]Uniformed Services University of the Health Sciences, [5]University of California at San Diego

A number of research groups have demonstrated that data from electronic medical records and patient self-reports can be used to develop prediction models for suicidal behaviors. These models typically find that a substantial minority of patients with subsequent suicidal behaviors are among the 5-10% of those with higher predicted risk. The analyses also typically show that a substantial proportion of high-risk patients have other adverse outcomes (e.g., all-cause mortality, nonfatal suicide attempts, mental hospitalization) even though only a small fraction die by suicide, indirectly justifying the cost-effectiveness of broad-gauged preventive interventions. A number of technical issues exist in these analyses involving optimal prediction algorithms, the value of expanding predictors to include ancillary information, and the optimal time horizon for prediction. Resolution of the latter issue depends on the interventions under consideration, raising the additional issue that the best model to predict suicide risk will not necessarily be the best model to predict optimal intervention response. The current presentation discusses all these issues in the context of ongoing work being carried out by the authors with data from the U.S. Army, the Veterans Health Administration, and a public health care system. We demonstrate that optimal prediction of suicide risk varies meaningfully by type of algorithm used; that ensemble methods meaningfully outperform individual algorithms; that ancillary information (both self-report and administrative) can be of considerable value in improving prediction; that the optimal model varies depending on the time horizon; and that prediction accuracy decays, especially at the upper end of the predicted risk distribution, as the time horizon increases. We close with a discussion of ongoing work designed to predict differential treatment response among patients at high suicide risk.

10.3 DESIGNING AUTOMATED SUICIDE RISK PREDICTION SYSTEMS FOR CLINICAL SETTINGS

Ben Reis*[1]

[1]Harvard Medical School & Boston Children's Hospital

Vast amounts of longitudinal data accumulating in electronic health record systems nationwide present a valuable opportunity for improving suicide risk screening and prediction. We will present our experiences developing suicide risk prediction models in a large diverse healthcare system. Examining de-identified data for 1.7M patients over 15 years, we developed predictive models based on Naive Bayesian Classifiers that achieved sensitive (33%–45% sensitivity), specific (90%-95% specificity), and early (3–4 years in advance on average) prediction of patients' future suicidal behavior. We are currently involved in validating these models across six additional health centers nationwide as part of the SCILHS/PCORnet Research Network. We will discuss methodological and operational issues involved in preparing such systems for clinical use, including validating case definitions, choosing actionable prediction timescales and thresholds, looking within and across populations with elevated risk, explicitly modeling temporal risk, and effectively communicating risk to clinicians as part of the clinical workflow.

10.4 PREDICTING SUICIDAL BEHAVIOR IN LARGE INTEGRATED HEALTH SYSTEMS

Gregory Simon*[1], Susan Shortreed[1], Eric Johnson[1], Arne Beck[2], Brian Ahmedani[3], Jean Lawrence[4], Frances Lynch[5], Rebecca Rossom[6], Beth Waitzfelder[7]

[1]Kaiser Permanente Washington Health Research Institute, [2]Kaiser Permanente Colorado Institute for Health Research, [3]Henry Ford Health System, [4]Kaiser Permanente Southern California Center for Research and Evaluation, [5]Kaiser Permanente Northwest Center for Health Research, [6]HealthPartners Institute, [7]Kaiser Permanente Hawaii Center for Health Research

Effective population-based suicide prevention will require accurate tools for large-scale risk stratification using data available from electronic health records. This presentation will describe ongoing development and implementation of risk stratification models in seven large healthcare systems participating in the NIMH-funded Mental Health Research Network. Data regarding approximately 20 million visits by 3 million patients aged 13 or older are used to predict risk of suicide attempt or suicide death over 90 days following an outpatient mental health visit. In this presentation, methods and findings of this ongoing work will be used to illustrate key issues and questions regarding population-based risk prediction, including:

- Defining specific prediction goals based on health system operational questions
- Defining denominator populations based on specific prediction goals
- Translating original health records data to discrete predictors
- Selecting and defining suicidal behavior outcomes
- Selecting among modeling approaches
- Understanding trade-offs between prediction and interpretability
- Evaluating accuracy of prediction
- Reporting prediction accuracy to non-technical audiences
- Applying model results to operational or quality improvement decisions

11. INTERVENTIONS TO PREVENT CHILD AND ADOLESCENT SUICIDE

Chair: Vladimir Carli, Karolinska Institutet/NASP

Suicide is a serious global public health concern with severe societal implications. Due to the magnitude of the problem, recognising the need for suicide prevention among youths is imperative. The design and evaluation of primary and secondary (universal, selected, and indicated) suicide preventive interventions for young people is particularly challenging, due to methodological difficulties related to the study group, the outcome measures, ethical aspects and confounding factors.

11.1 YOUTH AWARE OF MENTAL HEALTH (YAM): CHALLENGES IN THE DESIGN AND EVALUATION OF UNIVERSAL SUICIDE PREVENTION PROGRAMS FOR ADOLESCENTS

Danuta Wasserman[1], Vladimir Carli*[1], Gergo Hadlaczky[1], Camilla Wasserman[2]

[1]Karolinska Institutet/NASP, [2]Columbia University and New York State Psychiatric Institute Dept of Child and Adolescent Psychiatry

Suicide is one of the leading causes of death among young people globally and primary prevention measures in schools are important. It is known that establishing and maintaining controlled conditions is difficult in population-based suicide preventive studies when conducted in natural field settings, such as schools. Research designs in these studies vary, but randomized controlled trials (RCT) are considered the gold standard in the evaluation context, and are requested as a basis for economic decisions to implement interventions. The role of youth in mental health research and adolescent participation in the implementation will be elucidated by examples from the Youth Aware of Mental Health (YAM) prevention program. YAM was associated with a significant reduction of incident suicide attempts (odds ratios [OR] 0·45, 95% CI 0·24–0·85; p=0·014) and severe suicidal ideation (0·50, 0·27–0·92; p=0·025), compared with the control group. When the two outcomes of suicidal ideation and attempt were combined, one suicidal outcome was prevented for around every 91 students exposed to YAM. An analysis of YAM in ten European Union countries showed the program to be cost-effective. The feedback from YAM coordinators and pupils shows that the local context and choice of pupils influences the content of the role-plays and dilemmas on which the classroom is working on. Every classroom is different, consequently flexibility is central to a successful implementation, in spite a strict framework for the 3-week, 5-hour duration and structure of the YAM around topics: What is mental health? Self-help advice, Stress and crisis, Depression and suicidal thoughts, Helping a friend in need, and Who can I ask for advice?? As the ultimate purpose of suicide preventive interventions is to prevent deaths from suicide, completed suicide is generally considered to be the most relevant outcome measure. Other variables such as attempted suicide, which is regarded as one of the most important risk factors for completed suicide, may act as intermediate outcome measures. The major methodological problems of determining sample sizes that are needed to provide sufficient statistical power to detect significant effect sizes will be presented.

11.2 AS SAFE AS POSSIBLE (ASAP): A BRIEF INPATIENT INTERVENTION SUPPORTED BY A PHONE APP TO PREVENT RECURRENT SUICIDAL BEHAVIOR IN ADOLESCENTS

David Brent*[1], Betsy Kennard[2], Candice Biernesser[1], Alexandra Foxwell[2], Tina Goldstein[1], Alexandra Moore[2], Dana McMakin[3], Kristin Wolfe[2], Jamie Zelazny[1]

[1]UPMC/ Western Psychiatric Institute & Clinic, [2]UTSW, [3]Florida International University

One of the highest risk periods for adolescent suicide and suicidal behavior is immediately following discharge from a psychiatric hospital. Even if outpatient treatment can be initiated soon thereafter, patients continue to be at high risk until the patient gains sufficient skills from outpatient therapy. Therefore, we developed a brief, inpatient based intervention to adolescents who had been psychiatrically hospitalized for either a suicide attempt or suicidal ideation. This intervention was supported by a safety planning app, Brite, that supported participants emotion regulation skills. In this two-site, treatment development study, we randomized 66 suicidal adolescents to either receive usual care, or usual care, enhanced with ASAP. Participants were followed up by phone at 4, 12, and 24 weeks after discharge. Those youth who were received ASAP plus usual care were less likely to experience suicidal ideation or engage in suicidal behavior over the 6 month follow-up (51% vs. 87%, NNT=3, d=-0.58). The hazard of a suicide attempt was also lower in those who received ASAP (incidence rate ratio [IRR]=0.58). Participants reported high satisfaction with the intervention and BRITE, and used BRITE and average of 15 times post-discharge. ASAP and the Brite app show promise in reducing suicidal ideation and behavior in high-risk adolescents post-discharge from psychiatric hospitalization.

11.3 DBT IN SUICIDAL AND SELF-HARMING ADOLESCENTS

Lars Mehlum*[1]

[1]National Centre of Suicide Research and Prevention, Institute of Clinical Medicine, University of Oslo

Background: Repetitive suicidal and self-harming behavior - highly prevalent in adolescents and a strong risk factor for long-lasting psychiatric morbidity and completed suicide – is often experienced as particularly challenging and risky to treat by many clinicians. Many teenagers drop out of treatment prematurely because of their treatment interfering behaviors or lack of support from families or clinical services. Dialectical behavior therapy adapted for adolescents (DBT-A) has been shown to effectively reduce self-harming behavior, suicidal ideation and depressive symptoms in adolescents. In this study we focus on the long-term outcomes after DBT-A and potential mediators and moderators of treatment effects.
Methods: We followed adolescents who had participated in a randomized control trial of 19 weeks of either DBT-A or enhanced usual care (EUC) one and two years after treatment completion. Of the original 77 adolescents included in the RCT, a total of 71 adolescents (92%) participated at both 1-year and 2-year follow-up. Frequency of suicidal and non-suicidal self-harm episodes, severity of suicidal ideation and depression as our primary outcome measures in addition to a range of secondary outcome measures regarding use of health care services, psychiatric symptoms, borderline pathology and overall functioning.
Results: Over both the entire follow-up DBT-A remained superior to EUC in reducing the frequency of self-harm. A reduction in suicidal ideation, hopelessness and borderline symptoms during the trial treatment period significantly mediated a stronger reduction in self-harm episodes during the follow-up period. Adolescents who had received DBT-A used significantly less additional treatment after completion of the treatment trial period. A duration of follow-up treatment of more than 6 months was a significant moderator for the long-term reduction in self-harm episodes. For outcomes such as suicidal ideation, hopelessness and depressive or borderline symptoms and for the global level of functioning inter-group differences apparent at the end of treatment were no longer observed, mainly due to participants in the EUC group having significantly improved on these dimensions over the follow-up.

Discussion: The stronger long-term reduction in self-harm and more rapid recovery in suicidal ideation, depression and borderline symptoms suggest that DBT-A is a favorable treatment alternative for adolescents with repetitive suicidal and self-harming behavior. Our results also suggest that outcomes after this relative brief 19-week treatment could be improved even more by supplementing it with some form of less intensive follow-up treatment.

11.4 IMPLEMENTING ZERO SUICIDE STRATEGIES FOR YOUTH: ARE WE READY?

Joan Asarnow*[1]

[1]David Geffen School of Medicine at UCLA

Statistics for 2015 indicate that suicide was the second leading cause of death globally among youths ages 15-29. In contrast to other leading causes of death, suicide rates have not shown stable and strong declines. While suicide is a global priority and the evidence supporting suicide prevention has advanced, the tragedy of suicide deaths continues to afflict people and nations across the globe.

This presentation focuses on the Step2Health Study, new research funded by the United States National Institute of Mental Health. The Step2Health study aims to test a comprehensive system-wide approach to suicide prevention and is designed to be implemented within a health system that has made a commitment to the aspirational goal of "zero suicide", working to make suicide a "never event."

The presentation will emphasize the scientific evidence supporting the approach adopted in the Step2 Health study. New research on interventions for treating youths screening positive for elevated suicide risk will be presented with an emphasis on: 1) results from a recent trial of the SAFETY intervention, a family centered cognitive-behavioral intervention informed by Dialectical Behavior Therapy (DBT); 2) results from a recent multi-site U.S. trial evaluating DBT for adolescents; and 3) strategies for integrating evidence-based treatment and prevention strategies within health system services. These results will be considered within the context of other work demonstrating weak benefits from treatment as usual after suicidal episodes and strategies for addressing barriers to evidence-based care in routine health services.

12. PSYCHOSOCIAL INTERVENTIONS TO PREVENT SUICIDE

Chair: Gregory Brown, Perelman School of Medicine University of Pennsylvania

Overall Abstract: Psychosocial interventions targeting suicidal thoughts and behaviors are essential for reducing suicide attempts and death by suicide. A number of psychotherapeutic approaches have been found to be effective for reducing suicide risk. This symposium features several, specific psychosocial interventions including the Safety Plan Intervention (SPI), Cognitive Therapy for Suicide Prevention (CT-SP), Collaborative Assessment and Management of Suicidality (CAMS), and the Interpersonal Psychotherapy for Adolescents (IPT-A). Recent adaptations and studies of these interventions that provide empirical support for their use in a variety of health care settings will be described.

12.1 COGNITIVE THERAPY FOR SUICIDE PREVENTION: RECENT ADVANCES

Gregory Brown*[1]

[1]Perelman School of Medicine University of Pennsylvania

Cognitive Therapy for Suicide Prevention (CT-SP), developed by Drs. Gregory Brown and Aaron Beck, is a type of psychotherapy that is based primarily on the assumption that individuals who are suicidal or who attempt suicide lack specific cognitive or behavioral skills for coping effectively with suicidal crises. The primary focus of CT-SP is on targeting suicidal ideation and behavior, directly, rather than focusing on the treatment of other psychiatric disorders that include suicidal behavior as a symptom. Although there are many motivations and distal risk factors for suicide, the principal aim of this treatment is to identify the specific triggers and proximal risk factors that occur during a suicidal crisis and then to identify specific coping and problem-solving skills that could be used to help individuals survive future crises. CT-SP has been recognized as one of the few evidence-based, psychotherapy interventions specifically for suicide prevention. In a landmark randomized controlled trial conducted by Drs. Brown, Beck and colleagues, CT-SP has been found to be efficacious for preventing suicide attempts as well as decreasing other risk factors for suicide such as depression and hopelessness. Recent findings supporting a partial replication of this study in the community by non-expert therapists will be described. CT-SP has also been adapted for suicidal older men, suicidal military service members, and suicidal veterans with substance use disorders. Ongoing clinical trials using this approach are occurring in outpatient, intensive outpatient and inpatient behavioral health settings. These adaptations of CT-SP represent a flexible treatment approach that is tailored to patients' individualized case conceptualizations for maximizing the likelihood of decreasing risk.

12.2 BRIEF INTERVENTIONS TO PREVENT SUICIDE

Barbara Stanley*[1], Gregory Brown[2], Lisa Brenner[3], Marjan Holloway[4]

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Brief interventions are important component of interventions to prevent suicide. They assist suicidal individuals with means of coping during a suicidal crisis. In this presentation, we will focus on the effectiveness of the Safety Planning Intervention (SPI), a six step process designed to identify warning signs of an impending crisis, sources of internal and social support and means reduction. Our data demonstrate that the SPI with phone follow up shows a 45% reduction in suicide behaviors compared to usual care. Furthermore, treatment engagement was higher in the intervention group. Thus, SPI appears to be an effective intervention. We will also report findings on what elements of the intervention are related to positive outcomes

12.3 THE COLLABORATIVE ASSESSMENT AND MANAGEMENT OF SUICIDALITY (CAMS): ADAPTATIONS OF THE APPROACH

David Jobes*[1]

[1]The Catholic University of America

Despite the enormous humanitarian and economic toll of suicide, mental health systems of care are largely under-prepared to work effectively with suicidal individuals. There is an over-reliance on clinical responses that have either mixed or little to no-evidence base, which may in part explain why suicide has been a leading "Sentinel Event" in U.S. health care settings for many years (The Joint Commission, 2016). In response to these concerns a recent

policy initiative called “Zero Suicide” has advocated a systems-level response to the suicidal risk within healthcare and this policy initiative has yielded some encouraging initial results (Hogan, 2016). Along these lines, Jobes (2013) proposed a “Stepped-Care Approach to Suicide Care” that has been adapted and used within the Zero Suicide curriculum. This model supports the use of suicide-specific care that is evidence-based, least-restrictive, and cost-effective across the full spectrum of clinical settings. In response to the above noted concerns, the “Collaborative Assessment and Management of Suicidality” (CAMS) is one example of a suicide-specific evidence-based clinical framework that can be adapted and used across the full range of stepped-care service settings (Jobes, 2016). CAMS is now supported by four randomized controlled trials (RCT's) and eight non-randomized published clinical trials showing replicated evidence of rapid reductions in suicidal ideation, overall symptom distress, hopelessness, depression, anxiety, and promising data about reducing suicide attempts and self-harm in 6-8 sessions. CAMS also increases hope, patient satisfaction, and retention to clinical care. As a therapeutic framework, CAMS is relatively easy to train to adherence and its extensive documentation using a multipurpose assessment, treatment planning, tracking and outcome tool called the "Suicide Status Form" (SSF) should help decrease the risk of malpractice liability. CAMS thus offers a flexible approach that can be used in a range of clinical settings with different suicidal populations. To this end, this presentation will review various adaptations of CAMS in outpatient settings (e.g., counseling centers, private practice, community mental health) as well as more restricted/inpatient settings (e.g., respite care, inpatient psychiatric care, forensic, and emergency departments). As noted, CAMS can be modified and used with different populations (e.g., adults, teens, and children) and also modified to accommodate cultural considerations. CAMS is currently being adapted and studied as a group modality (CAMS-G). We are also studying a relational agent system (CAMS-RAS) which employs an adapted use of CAMS within a technology-based brief intervention using an avatar. These various adaptations and uses of CAMS cut across the previously noted stepped-care model, providing an evidence-based approach for decreasing suicidal risk in the pursuit of clinically saving lives from suicide.

12.4 PRELIMINARY OUTCOMES OF INTERPERSONAL PSYCHOTHERAPY (IPT-A) FOR DEPRESSED YOUTH ENGAGING IN SUICIDAL BEHAVIOR (IPT-A-CSP)

Anat Brunstein Klomek*[1], Moira Rynn[2], Paula Yanes-Lukin[2], Pablo Goldberg[2], Ana Ortin[2], Laura Mufson[2]

[1]IDC Herzliya, [2]Columbia University

Adolescents at risk for suicide suffer from significant interpersonal problems. Very few psychotherapeutic interventions have been developed to specifically prevent or treat suicide among adolescents. These interventions usually include interpersonal aspects but these aspects are not necessarily the focus of the treatment. Interpersonal Psychotherapy for depressed adolescents (IPT-A) is an evidence based intervention which targets interpersonal difficulties in order to reduce depression. Previous studies that have examined the efficacy of IPT-A have generally excluded participants with severe and active suicidal ideation and attempts despite the possibility that IPT-A may be beneficial for this population. The goal of the current pilot project was to adapt IPT-A as an intervention for adolescents who had severe suicidal ideation and/or have attempted suicide. Eight adolescents ages 12-19 who were diagnosed with Major Depressive Disorder (MDD)/dysthymia/Depressive Disorder Not Otherwise Specified (DDNOS) and expressed severe suicidal ideation or reported having a recent non-medically lethal attempt and their parents were enrolled in the protocol. The IPT-

A manual for adolescent depression was expanded to 20 weeks and adapted to focus on suicide prevention including use of an interpersonal safety plan. The first 8 weeks included two sessions a week (in a children's day treatment program) followed by 12 weekly outpatient sessions. Adolescents were assessed at baseline and after 4,8,12,16 and 20 weeks. Measures included: Kiddie Schedule for Affective Disorders and Schizophrenia for school-aged children-Present and Lifetime (K-SADS-PL) to assess clinical diagnoses; depression symptoms via the Beck Depression Inventory (BDI –II) and the Children's Depression Rating Scale (CDRS-R); overall functioning as assessed by the Children's Global Assessment Scale (C-GAS); clinician-assessed improvement and severity as assessed by the Clinical Global Impressions (CGI); interpersonal functioning as assessed by the Social Adjustment Scale (SAS-SR); and suicidal ideation as assessed by the Suicide ideation questionnaire (SIQ-JR). Four adolescents were on medication at baseline and three were medicated during the trail. Results at the end of treatment at 20 weeks indicated that both depression (BDI-II) scores and suicidal ideation (SIQ-JR) improved significantly, which was similarly reflected in the CGI-Improvement scores. To conclude, IPT-A is a feasible treatment for adolescents at risk for suicide but further research with a larger sample in a randomized controlled clinical trial is needed to establish efficacy.

13. NEUROBIOLOGY OF SUICIDE (GENETICS)

Chair: Dan Rujescu, University of Halle

Overall Abstract: Suicidal behavior causes about 1 million deaths worldwide each year. The risk of suicide-related behavior is determined by a complex interplay of sociocultural factors, psychiatric disorders, personality traits, and genetic as well as neurobiological vulnerability. This symposium will focus on neurobiology of suicidal behaviour.
First, Gil Zalsman will highlight own studies from DNA Microarrays to Micro RNAs in Suicide Research. Beside association studies he will present data on genome wide association study (GWAS) on brains of suicide victims. Next, he will give an overview on early stressful life events (SLE) predicting depression and suicidality. Using an animal model for despair and anhedonia, he will demonstrate a Gene X Environment X Timing interaction in behavioral tests. Studies on DTI fiber tracking, epigenetics, and protein synthesis will be addressed too. The aim is to detect biomarkers that predict response to treatment and could allow clinicians to personalize antidepressant treatment to patients more successfully; thereby reducing the morbidity and mortality from suicide associated.
Gustavo Turecki will focus on the current stage of epigenetics. Epigenetic mechanisms, which alter gene expression via alternative mechanisms to the coding DNA sequence, result from environmental effects acting on the genome. Studies in rodents indicate that variation in the early environment will trigger these epigenetic modifications and human data suggest the same may be true in humans. The expression of a number of genes, which are involved in normal brain functions and that have been shown to be under epigenetic control, seem to be dysregulated in suicide. The talk will briefly describe the main epigenetic mechanisms involved in the regulation of gene expression and discusses recent findings of epigenetic alterations in suicidal behavior. Enrique Baca-Garcia will especially highlight the relationship between impulsive traits and suicide attempts. Two dimensions describe this relationship: the impulsivity of the suicide attempt and the impulsivity of the suicide attempter. Several biological markers, particularly serotonergic dysfunction, have been associated with impulsive personality traits, aggression and suicidal behavior. Finally, Dan Rujescu will

continue with that topic and focus on genome wide association studies on impulsivity and anger.

13.1 FROM DNA MICROARRAYS TO MICRO RNAS IS SUICIDE RESEARCH

Gil Zalsman*[1], Yaron Goren[2], John Mann[3]

[1]Geha Mental Health Center, Sackler School of Medicine, Tel Aviv University, [2]Geha MHC, Tel Aviv University, [3]Columbia University & New York State Psychiatric Institute

Suicide runs in families and has a major hereditary factor. For two decade we and others tried a genetic association studies approach to find a genetic marker for suicide (1). Most of these findings were not replicated. We moved than to a genome wide association study (GWAS) done on brains of suicide victims, probing 14 SNPs associated with suicide (2). Later, evidence have shown that early stressful life events (SLE) predict depression and suicidality in carriers of specific polymorphisms and alter brain responses (3). Using an animal model for despair and anhedonia, we have demonstrated a Gene X Environment X Timing interaction in behavioral tests (4) as well as in brain architecture as demonstrated in a DTI fiber tracking analysis (5). The way genes and environment interact might be through epigenetics. This term refers to changes in DNA that change gene expression. These changes can be connected to environment during developmental window and include methylation and non-coding RNAs=microRNAs. Some studies have shown changes in methylation in brains of suicide victims (6). The recently discovered MicroRNAs are short RNA sequences that regulate protein synthesis. A single microRNA can simultaneously regulate the levels of dozens of proteins which work in concert to perform a complicated biological task and serve as a "genetic master switch" that links environmental and genetic factors. Recent data from our large systematic review of evidence for the effectiveness of suicide prevention interventions in the national level published over the last decade, have shown the importance of effective and early treatment of depression (7). Since the effect of SSRIs may be delayed up to 8-10 weeks it is crucial to know in advance which SSRI will be effective in a specific patient. In a new study we aim to identify a set of microRNAs, which serve as unique biomarkers, in patients suffering from major depression disorder in order to predict response to treatment with antidepressants (SSRIs) (8). Biomarkers that predict response to treatment would allow clinicians to match and personalize antidepressant treatment to patients more successfully; thereby reducing the morbidity and mortality from suicide associated with the lag until an effective treatment is applied. We will conclude in some future direction in clinical approaches and research of suicidal behavior in the young.

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13.2 EPIGENETICS OF SUICIDAL BEHAVIOR

Gustavo Turecki*[1]

[1]McGill University

Epigenetic mechanisms, which alter gene expression via alternative mechanisms to the coding DNA sequence, result from environmental effects acting on the genome. Studies in rodents indicate that variation in the early environment will trigger these epigenetic modifications and human data suggest the same may be true in humans. The expression of a number of genes, which are involved in normal brain functions and that have been shown to be under epigenetic control, seem to be dysregulated in suicide. The talk will briefly describe the main epigenetic mechanisms involved in the regulation of gene expression and discusses recent findings of epigenetic alterations in suicidal behavior.

13.3 GENETICS OF IMPULSIVITY, AGGRESSION AND SUICIDE

Enrique Baca-Garcia*[1], Concepcion Vaquero[2], Pablo Fernandez Navarro[3], Maria Luisa Barrigon[4], Jose De Leon[5]

[1]Fundacion Jimenez Diaz, [2]UAM, [3]CSIC, [4]FJD, [5]University of Kentucky

Impulsivity and aggression are important components of suicidal behavior but the relationship between impulsive traits and suicide attempts is far from clear. Two dimensions describe this relationship: the impulsivity of the suicide attempt and the impulsivity of the suicide attempter. Several biological markers, particularly serotonergic dysfunction, have been associated with impulsive personality traits, aggression and suicidal behavior. To date, research studies on this topic are flawed by methodological caveats that limit the interpretation of empirical data. Indeed, confusing, contradictory and paradoxical results can be found in the literature. Ecological momentary assessment, a new research paradigm, may help to solve some methodological problems related with trait and state assessment. Several measures can be used to assess impulsivity in real life, such as answers to selected items, mobile phone use, actimetry, or activity in internet apps. Specific analyses can also be applied to model the behavior of the participant based on a dynamic record of experiences. Impulsive aggression in suicidal patients could then be used as a clinical target to prevent future suicidal acts.

13.4 GENOME WIDE ASSOCIATION STUDIES ON IMPULSIVITY AND AGGRESSION

Dan Rujescu*[1]

[1]University of Halle

Suicidal behavior is based on a complex interaction of different factors such as psychiatric disorders, personality traits (e.g. aggression, impulsiveness, neuroticism), severe childhood traumas, chronic illness, social factors (e.g. unemployment, lack of a social network, traumatic life events), cognitive flexibility, as well as neurobiological and genetic factors. The latter of which act in the sense of predisposing risk factors in interaction with environmental factors. The familial accumulation of suicidal behavior as well as the heritability is estimated of about 40-55%. Dan Rujescu will present candidate gene studies on personality traits, recent genome-wide association studies, as well as gene x environment analyzes.

14. POPULATION AND SYSTEMS BASED APPROACHES TO SUICIDE PREVENTION

Chair: Nav Kapur, University of Manchester

Overall Abstract: Suicide is a leading cause of death internationally and is a complex behaviour with a complex aetiology. Research to date has largely been based on single interventions but approaches to suicide prevention need to be multifaceted. What might be the benefit of providing integrated, coordinated, and multi-disciplinary interventions simultaneously to large populations? This symposium will discuss the potential power of population and system-based approaches to prevention. The presentations will focus on US, UK, and international health perspectives on preventing suicide, a discussion of the Zero Suicide approach, and work on community-based suicide prevention and systems science. The symposium aims to generate new insights into how we prevent suicide in community settings and make health care systems safer.

14.1 POPULATION BASED AND SELECTED INTERVENTIONS FOR PREVENTING SUICIDE ACROSS THE CARE PATHWAY

Nav Kapur*[1]

[1]University of Manchester

Suicide occurs in people both in and out of health care contact. This presentation will consider the potential of suicide prevention across four settings: community; primary care; general hospitals; specialist mental health services. For each setting we will consider an example of a successful intervention and a suggestion for where we might focus our future research efforts. In community settings one obvious intervention is restriction of access to lethal means. This is relatively straightforward when there are common highly lethality methods in use that can easily be restricted but often the targets are less clear. An alternative might be to investigate why the people choose particular methods, in other words the cognitive availability of means of suicide. Many individuals have contact with primary care in the year before suicide but interventions and preventative approaches remain unclear. Better overall management of psychiatric disorder might be one possibility. In the general hospital setting the obvious target for intervention is non-fatal suicidal behaviour particularly in emergency departments. Although there is research evidence to guide us, there remains a significant implementation gap. In specialist mental health services, coordinated service changes appear to have an impact on suicide rates. The organisational context in which these changes are made is also of great importance. Approaches to intervention which are based on exclusively “high risk” approaches may not be effective. Future studies in health care settings need to consider patient safety as well as cost effectiveness.

14.2 RESEARCH SUPPORTING SUICIDE PREVENTION APPROACHES IN HEALTH SYSTEMS

Brian Ahmedani*[1]

[1]Henry Ford Health System

Suicide is a major public health concern. It is the 10th leading cause of death and the top cause of injury-related death in the United States (US). Unfortunately, suicide rates have actually increased by almost 25 percent since 2000. This trend prompted the National Action Alliance for Suicide Prevention (NAASP) and the US Surgeon General to publish a joint report in 2012 outlining a series of Aspirational Goals (AG) aimed at reducing suicide. The

report indicates that one of the most promising environments to implement suicide prevention practices is a healthcare system. Health systems usually target interventions to patients who are known to be at-risk, including those with mental health or substance use conditions or those with a prior suicide attempt. However, recent data from the Mental Health Research Network (MHRN) shows that while over 80% of individuals make a health care visit in the year before suicide, approximately half of all individuals do not have a mental health diagnosis. The vast majority of visits occur in outpatient primary care or general medical specialty settings. Thus, suicide prevention directed only towards individuals with a mental health diagnosis, on whom most interventions are currently focused, can only reach less than half of all healthcare patients before their death. Given that the base rate for suicide is low in general medical settings and that general medical providers, particularly those in primary care, are extremely busy with competing demands, there is an urgent need for more information on the possibility of extending suicide risk detection and prevention beyond behavioral health settings. Recently, several studies have provided evidence to inform the way this type of suicide prevention could be accomplished. This presentation provides an overview of several of these studies. Discussion on suicide risk and detection in health systems will include data from suicide risk factor and screening studies within a large network of health care systems across the United States. Research will also be discussed regarding potential interventions and clinical pathways for individuals identified as being at risk for suicide. These interventions will focus on current evidence aligned with suicide prevention strategies highlighted in the Zero Suicide model. Limitations and need for future research will be discussed. This presentation will integrate with others within the panel to provide multiple sources of current knowledge related to suicide prevention in health care settings.

14.3 SYSTEMATIC SUICIDE CARE: EVIDENCE FOR ZERO SUICIDE

Mike Hogan*[1]

[1]National Action Alliance for Suicide Prevention

This is a policy/practitioner's view of the evidence for "suicide care." Usual care for people at risk of suicide is unacceptably bad. Most people who die by suicide were engaged in healthcare, and seen recently before they died. Most practitioners (including not only general medical personnel, but also mental health professionals) received no training in assessing and more importantly managing suicidality. And, while there is increased evidence for many tasks of suicide care (I.e. screening, safety/crisis response planning, means reduction in the context of care, direct treatment of suicidality and caring contacts) these approaches are infrequently used. Additionally, given the complexity of suicide, the diversity of individual paths from suicidal ideation to completed suicide and the evidence about effective programs, logic and the evidence suggest that only systematic approaches are likely to move the needle of suicide among patients in care.

Zero Suicide, sometimes mischaracterized as a slogan or a mandate, is a collection of evidence-based tools for detecting and managing suicidality in healthcare settings. Based in part on the Henry Ford Health System's Perfect Depression Care Program, Zero Suicide is a systematic clinical approach that incorporates evidence based methods for healthcare settings, analogous to systematic approaches to manage other chronic illnesses (e.g. diabetes, depression) in healthcare settings. The approach was conceived by the Clinical Care Task Force of the National Action Alliance for Suicide Prevention and summarized in its 2011 report. Then, the concept was fleshed out by "innovator sites" in community mental health and advanced (comprehensive) primary care beginning in 2013-2014.

The approach proved feasible to implement in ordinary care settings. Early results show first that the obvious deficits in usual care can be addressed. These include: untrained professionals caring for patients often referred specifically because of suicidality; failure to systematically screen/assess/collaboratively safety plan/clinical means reduction/direct treatment of suicidality/supportive contacts; and the absence of a focus on suicide as a health care outcome.
Attention to suicide safe care has been advanced by The Joint Commission's Sentinel Event Alert on suicide. The National Institute on Mental Health has solicited applications for research on Zero Suicide, and a number of grants have been awarded. About 18 "Zero Suicide Academies" have been conducted to provide implementation/launch support for healthcare and behavioral healthcare organizations. The states of Utah and New York have initiated Medicaid Quality Improvement projects in suicide care. An estimated 600-+ healthcare organizations are implementing Zero Suicide approaches; remarkable penetration for an innovation less than 5 years old.
Suicide rates and deaths in the United States continue to rise. The American Foundation for Suicide Prevention has announced a commitment to a "20 by 25" campaign to reduce the rate of suicide 20 per cent by 2025; arms of the campaign include collaboration with gun shops, an emphasis on suicide prevention in the criminal justice system, and two health care priorities: implementation of Zero Suicide in large health systems, and improved suicide care in Emergency Departments.
Success is uncertain. Suicide prevention has not really been accepted as a core responsibility of health care. Results from improved care must be demonstrated, but this research is very difficult--recent NIMH awards may help. The suicide prevention field remains oriented to "upstream" prevention efforts, and many researchers search for more fundamental answers. Can this effort succeed?

14.4 SYSTEMS THINKING IN COLLABORATIVE, COMMUNITY-BASED SUICIDE PREVENTION: BRIDGING THE GAP BETWEEN COMMUNITIES OF RESEARCH AND PRACTICE

Ann Marie White*[1]

[1]University of Rochester Medical Center

Despite systematic quality improvements in health systems-based interventions, as well as overall mortality declines of the past decades, suicide deaths remain steadily on the rise. In response, communities seek to enact new community-based public health agendas that catalyze comprehensive, integrated approaches to suicide prevention. A host of ways are pursued, for instance, by addressing far ‘upstream’ (distal) common risks or protective factors that contribute to multiple adversities and more proximal factors, by linking suicide prevention to other injury prevention efforts, and by engaging novel community settings to expand suicide prevention beyond clinical care sites where it can be more commonly found.

If the reduction of suicide burdens requires an integrated mosaic of prevention and intervention supported by interactions across many community systems, then systems-oriented perspectives and analysis tools can strengthen this approach. However, it has not yet been possible to implement carefully designed public health programs that are at once, complementary, integrated and informed by methodologically rigorous systems thinking – in order to be efficient and far-reaching. While well-developed systems science methods and

tools exist that can help fill these knowledge and practice gaps, such approaches have yet to be applied widely in these injury prevention areas.

Academic-community partnerships among system scientists, system thinkers, and violence and injury professionals can help bring forth this next generation of suicide prevention. Helping public health professionals anticipate and learn how effects are shaped by interactions within and across prevention systems can improve integration practice. But, how does an academic-community collaborative and systems-science infused public health effort meet such practical needs of plotting strategies and processes to reduce these complex problems of injury while working outward from suicide reduction goals?

This presentation describes how systems thinking and system dynamics modeling approaches, in the context of action-oriented and community-driven public health efforts to reduce suicide, is being used to broaden the focus of preventing suicide –and its antecedent risks - as a highly preventable form of injury. Dynamic hypotheses that integrate the diversity of stakeholders' mental models for enacting comprehensive community-based suicide prevention in a state partnership illustrate the utility of applying this systemic public health approach.

15. MEDIA AND SUICIDE: IMPACTS OF PORTRAYALS OF SUICIDE, MASS SHOOTINGS, AND GAMBLING-SUICIDE

Chair: Thomas Niederkrotenthaler, Medical University of Vienna, Center for Public Health, Institute for Social Medicine, Suicide Research Unit

Overall Abstract: This symposium will put a focus on several emerging and timely issues in the area of media and suicide. First, presentations by Dr. Benedikt Till and Dr. Mark Sinyor will focus on harmful and potentially protective characteristics in media reporting on suicide. Using methodological approaches including content analysis of media reports, randomized controlled trials, as well as epidemiological pre- post analyses, these presentations will shed light on the current evidence about which media reporting characteristics are associated with suicide. A second emphasis will be put on the reporting of mass shootings, which has received increasing attention in 2016 when the first set of media recommendations for reporting on mass shootings were developed by an international team. Prof. Madelyn Gould will focus on a review of the evidence of contagion subsequent to the reporting of mass shootings. Finally, Prof. Steven Stack will focus on gambling suicide, a topic that has been neglected in the recent research literature but is a frequent topic in fictional portrayals of suicide in American cinema of the 1960ies. Prof. Stack argues that the legalization and legitimization of gambling in the United States brought about major changes in the portrayal of the link between gambling and suicide, although gambling remains a major risk factor for suicide.

15.1 REVIEW OF THE EMPIRICAL EVIDENCE FOR CONTAGION OF MASS SHOOTINGS

Madelyn Gould*[1], Michael Olivares[2]

[1]Columbia University & New York State Psychiatric Institute, [2]New York State Psychiatric Institute

Objective: The purpose of the current review was to determine whether media reports on mass shootings can lead to imitative acts of violence, with the goal of informing the development of media recommendations, if necessary, for reporting on these acts.

Methodology. A search was conducted in three major online databases, PsycInfo, PubMed and Scopus, to identify articles of any publication date pertaining to the contagion of mass shootings. The database searches resulted in a total of 615 articles: 106 from PsycInfo, 129 from PubMed, and 380 from Scopus, of which 7, in conjunction with 3 from a hand search, were empirical studies on the contagion of mass shootings. Results. Seven of the 10 mass shooting studies were conducted from the United States, two from Australia, and one from Germany. The studies varied with respect to the exposure stimuli in relation to which they measured contagion, and utilized a diversity of outcome measures, but these methodologic differences did not impact the results. The results indicate that mass shootings are increasing; media coverage of mass shootings is disproportionate to the actual frequency of these acts; and, most importantly, publicized incidents of mass shootings consistently increase the likelihood of further incidents. Conclusions. The current findings highlight the importance of recommendations for the reporting of mass shootings to help the media determine how to report on mass shootings while mitigating the possibility of contagion.
Dr. Gould is a Professor of Epidemiology in Psychiatry at Columbia University Medical Center, and a Research Scientist at the New York State Psychiatric Institute, New York, NY, USA. Mr. Olivares is a Research Assistant at the New York State Psychiatric Institute, New York, NY, USA.

15.2 PROTECTIVE MEDIA IMPACTS: AN UPDATE ON THE PAPAGENO EFFECT

Benedikt Till*[1], Thomas Niederkrotenthaler[1]

[1]Medical University of Vienna, Center for Public Health, Institute of Social Medicine, Suicide Research Unit

Background: Organizations dedicated to suicide prevention frequently use websites to educate the public about suicide. An important question is whether these websites have the potential to impact the risk factors for suicide among online users. However, evaluations of the impact of these educative websites are lacking. The present study aimed to investigate the impact of three educative suicide prevention websites compared to a website not related to suicide and tested the moderating effect of participants' vulnerability on the effects.
Methods: One-hundred and sixty-one adults were randomly assigned to four groups of a randomized controlled trial. Groups 1-3 were exposed to one of three German-speaking websites on suicide prevention (i.e., www.youth-life-line.de, www.u25-freiburg.de, www.frnd.de). Group 4 was exposed to a website not related to suicide. Data on the audience's suicidal ideation, mood, suicide prevention-related knowledge, and attitudes toward suicide and seeking professional help were collected with questionnaires before and immediately after exposure and one week thereafter. The sample was split into two groups by the median of suicidality at baseline.
Results: In contrast to the control group, exposure to any educative website on suicide resulted in a short-term deterioration of mood and a sustained increase in suicide-related knowledge, and there was a sustained reduction of suicidal ideation among participants with baseline suicidality above the median. The suicide prevention websites did not have any impact on attitudes toward suicide and seeking professional help. All effects were similar across intervention groups.
Discussion: Consistent with a Papageno effect, educative components of professional suicide prevention service providers seem to have a sustainable positive impact on suicide risk and increase suicide-related knowledge.

This is consistent with findings from other studies that will be discussed in this presentation demonstrating that stories of coping with suicidality and adverse circumstances in newspapers, fictional films, and social media have the potential to reduce suicide risk in vulnerable audiences. Overall, these findings underline that media can make a very relevant contribution to suicide prevention by minimizing sensationalist reporting, and maximizing reporting on how to cope with suicidality and adverse circumstances. This study was funded by the Austrian Science Fund (grant number P-23659-B11).

15.3 THE IMPACT OF PRINT AND ONLINE REPORTING ON SUICIDE DEATHS IN TORONTO

Mark Sinyor*[1], Jane Pirkis[2], Ayal Schaffer[3], Yas Nishikawa[3], Donald Redelmeier[3], Jitender Sareen[4], Anthony Levitt[3], Thomas Niederkrotenthaler[5]

[1]Sunnybrook, University of Toronto, [2]University of Melbourne, [3]Sunnybrook Health Sciences Centre, University of Toronto, [4]University of Manitoba, [5]Medical University of Vienna, Center for Public Health

Background: In 2009, the Canadian Psychiatric Association published guidelines on responsible reporting of suicide. This led to a backlash from some in the journalism community who argued that many of the putatively harmful and protective factors listed in the guidelines had limited support in the literature. This study is the first to examine the impact of these factors in a Canadian sample.
Method: We identified articles from 13 major print and online publications in the Toronto market (2011-2014) and abstracted basic information on article content as well as putatively harmful and protective elements identified in Canadian media guidelines. Suicide data for Toronto were abstracted from the Office of the Coroner of Ontario. Multivariate regression analyses were performed to determine whether there was a relationship between change in suicide deaths in the week after an article compared to a previous control window and specific article characteristics.

Results: There were 6,367 articles with a major focus on suicide in Toronto over the 4-year period. Item characteristics independently associated with increased suicides were a statement that suicide is inevitable (OR = 1.97; CI = 1.07-3.62, $p < .0.05$), suicide by jumping from a building (OR = 1.70; CI = 1.28 – 2.26, $p < 0.001$), suicide pacts (OR = 1.63; CI = 1.14 – 2.35, $p < 0.01$), suicide method in the headline (OR = 1.41; CI = 1.07 – 1.88, $p < 0.05$), about the elderly (OR = 1.25; CI = 1.03 – 1.52, $p < .05$), firearm suicide (OR = 1.28; CI = 1.08 – 1.51, $p < 0.01$), and that identified the deceased as a celebrity (OR = 1.27; CI = 1.08-1.50, $p < .01$). Item characteristics associated with no change or a decrease in suicides were articles about suicide policy (OR = .80; CI = .70 - .92, $p < .01$), a specific person's suicidality/death (OR = .78; CI = .68 - .90, $p < .01$) and cutting as a method of suicide (OR = .70; CI = .52 - .94, $p < 0.05$). No putatively protective factors were significant in the regression analysis.
Discussion: This study adds to previous research from Europe and Australia showing that media item characteristics such as suicide by jumping and celebrity suicide are associated with subsequent suicide deaths. These and other identified associations should inform future discussion between suicide experts and journalists. The impact of this work on collaborative development of updated Canadian guidelines with input from journalists and journalism professors will be discussed.

15.4 THE DECLINE OF THE GAMBLING-SUICIDE CONNECTION IN AMERICAN CINEMA, 1900-2006

Steven Stack*[1], Barbara Bowman[2]

[1]Wayne State University, [2]Center for Suicide Research

This article assesses the effect of the legalization of gambling on the presentation of suicide in American feature films. It is hypothesized that the enhanced legitimization of gambling in the last century (starting with legalization of state lotteries and then casinos) was associated with a decrease in the frequency of gambling related suicides in the cinema. Methods. Data refer to 1,115 suicides in American feature films dating from 1900-2006. Results. A logistic regression analysis determined that controlling for film genre and demographics of the suicide victim, films made before 1960 were 4.05 times more likely to portray suicide as a result of gambling than films made after 1960. Conclusion. Although gambling remains a significant risk factor for suicidality, modern films are less apt than older ones to portray gambling as a risk factor. Cultural changes and the interests of economic and political elites are associated with this change in cinematic communication.

Co-Chair: Jane Pirkis, University of Melbourne

16. COMMUNITY BASED SUICIDE PREVENTION

Chair: Keith Hawton, Warneford Hospital/Oxford University

Overall Abstract: Most national suicide prevention policies include a major focus on community-based initiatives. This is because generally population-level interventions produce greater benefits than those focused on high risk groups (although both approaches are essential components of a comprehensive programme). Access to means of suicidal behaviour is generally recognised as being a key element in the suicidal process and is therefore an integral part of community-based initiatives. Not only will the lethality of the available means be likely to determine whether the outcome is fatal or non-fatal, but ready access may also contribute to, both thoughts about suicide the nature of the act that is chosen. In this symposium three of the most common methods used for suicide will be discussed. The first of these is firearms, which are commonly used for suicide in several countries, especially the USA. There has been much debate and controversy around the extent to which access to firearms can and should be controlled. Dr Matthew Miller will address the evidence that access to firearms contributes to risk of suicide, the challenges of implementation of changes in availability of firearms in the USA, storage practices, and community beliefs about the role of firearm availability to risk of suicide.

Ingestion of pesticides is a major method of suicide globally, with at least 150,000 such deaths worldwide per year. This method is especially frequent in lower and middle income countries where there are rural areas with large numbers of small farm holdings. In recent years considerable efforts have been made to address this issue. Dr Melissa Pearson will describe several initiatives regarding this problem, including safer storage and attempts to change pesticide vendor behaviour for persons at risk.

Self-poisoning with medication, especially analgesics, is another important method of suicide, especially in women. Dr Keith Hawton will present two initiatives and their results in the UK to address this problem, the first being introduction of smaller packs of paracetamol (acetaminophen), and the second withdrawal of a particularly toxic analgesic, co-proxamol (a combination of dextropropoxyphene and paracetamol).

Entirely different approaches to community-level prevention of suicidal behaviour involve addressing risk upstream, i.e. prevention initiatives for populations well before suicidal behavior or even risk may have become manifest. Dr Peter Wyman will provide an overview of such initiatives, including school and family-based interventions, mixed community programmes to address a range of risk and protective factors, and recommendations for strengthening community youth suicide prevention programmes.

16.1 INTERVENTIONS TO LIMIT SUICIDE BY SELF-POISONING

Keith Hawton*[1]

[1]Warneford Hospital/Oxford University

Self-poisoning is a common method of suicide, although its extent is often under-estimated because deaths are more likely to be designated as accidental than with most other methods. Examples will be presented of approaches to preventing suicidal poisoning involving analgesic medication.

One approach is reduction in the amount of medication available. An example of where this has been tested was the introduction of smaller packs of the analgesic paracetamol (acetaminophen) in the UK. Following increasing numbers of deaths due to hepatotoxicity after ingestion of large amounts of paracetamol and research showing that many such acts were impulsive and involved ingestion of medication stored in households, smaller packs of paracetamol were introduced for over-the-counter sales in September 1998. This has resulted in a reduction in deaths involving this method and fewer people developing hepatotoxicity requiring liver transplantation.

Another approach is removal of a medicine. This was done for suicide prevention purposes when the prescription-only analgesic co-proxamol (paracetamol/dextropropoxyphene combination) was withdrawn in the UK after demonstration of its high relative toxicity. This was followed by not only virtual cessation of deaths from use of this method of poisoning, but lack of substitution by fatal self-poisonings with other analgesics, at least in the first few years. This resulted in withdrawal of dextropropxyphene (the more lethal component) in many countries. Such approaches may also have limitations, which will be discussed.

16.2 FIREARMS AND SUICIDE

Matthew Miller*[1]

[1]Northeastern University

In 2015, the most recent year for which mortality data are available, approximately 44,000 people in the United States died by suicide, making suicide the tenth leading cause of death in the United States. Among young Americans, suicide claimed an even greater share of overall mortality, making suicide the second leading cause of death for people aged 10-34 and the fourth leading cause for those aged 35-54. For Americans as a whole, firearms account for half of all suicides.

In 2010, the National Action Alliance for Suicide Prevention Research Prioritization Task Force identified reducing access to firearms as a critical component of a comprehensive suicide prevention strategy capable of reducing the suicide rate by 20% over a 5-year period. This recommendation, and the subsequent adoption in 2012 of means restriction as the 6th of 13 explicit goals of the National policy (Promote efforts to reduce access to lethal means of suicide among individuals with identified suicide risk), was based on the well-established

association between the firearm availability and increased risk of suicide, from both individual level and ecologic studies, along with data from other countries documenting substantial declines in suicide rates overall when highly lethal methods commonly used in suicide are made less accessible. The 6th goal explicitly encourages providers who interact with individuals at risk for suicide to routinely assess for access to lethal means, especially firearms, as well as for prevention advocates to partner with firearm dealers and gun owners to incorporate suicide awareness as a basic tenet of firearm safety and responsible firearm ownership, and to develop and implement new safety technologies (e.g., smart gun technologies) to reduce access to lethal means. Despite strong empirical evidence linking firearm access and suicide, endorsement of counselling vulnerable populations about reducing access to firearms by the Office of the Surgeon General, the National Action Alliance for Suicide Prevention, and several medical associations, almost nothing is known about the extent to which U.S. adults believe that household firearm availability increases the risk of suicide and little is known about the extent to which clinicians in the US engage in lethal means counseling in general or about firearms in particular.
The presentation for this symposium will review salient empirical evidence that establishes a strong link between access to firearms and the risk of suicide, an overview of the how limited engagement in lethal means counseling remains in the US, and preliminary findings from a national survey conducted in 2015 that describes firearm storage practices in the US and beliefs about the relationship between household firearms and the risk of suicide.

16.3 INTENTIONAL PESTICIDE POISONING

Melissa Pearson*[1], Michael Eddleston[1], Flemming Konradsen[2], David Gunnell[3], Keith Hawton[4], Manjula Weerasinghe[5], Duleeka Knipe[3]

[1]University of Edinburgh, [2]University of Copenhagen, [3]University of Bristol, [4]Warneford Hospital/Oxford University, [5]Rajarata University of Sri Lanka

Individual Abstract Agricultural pesticide self-poisoning is a major public health problem in rural Asia. Intentional pesticide poisoning (IPP) is highly lethal and the most common method of self-harm in many rural areas of Asia. Means restriction efforts have concentrated on removing and/or reducing the easily availability of pesticides in the home environment. Two strategies that have been advocated are regulation of the most toxic chemical and safer' household pesticide storage to prevent deaths.
Regulatory action, replacing highly hazardous pesticides in agricultural practice with integrated pest management and alternative less hazardous pesticides, has major beneficial effects on both pesticide suicides and total suicides. In Sri Lanka regulation of pesticides has resulted in a 75% reduction in total suicides with an estimated 93,000 lives saved over 20 years and little if any effect on agricultural yield.
Pilot studies of improved household storage have been performed in Sri Lanka and China and of community lockers in India, with indications that the approach is appreciated by farming communities. In Sri Lanka we performed a community-based cluster randomised controlled trial in Sri Lanka with 180 rural villages (population 223,861). We examined the effectiveness of the safe storage device and any evidence of method substitution. This large data set has allowed us to examine related issues of IPP access from pesticide vendors, spatial analysis and examination of community level influences including alcohol and crime.

16.4 UPSTREAM YOUTH SUICIDE PREVENTION IN COMMUNITY SETTINGS: EMERGING EVIDENCE

Peter Wyman*[1]

[1]University of Rochester School of Medicine and Dentistry

Most of the research evidence on youth suicide prevention is focused on interventions for adolescents experiencing ideation/recent attempts or on other high risk groups (e.g., elevated depression or hospitalization). However, there is growing recognition among researchers and policy makers that suicide prevention needs to move 'upstream' to yield the population benefits, like the success of cardiovascular population prevention efforts (e.g. diet, exercise) that have resulted in decreased cardiovascular mortality. This presentation will (a) summarize recent evidence from re-analyses of school- and family-based preventive interventions aimed at decreasing aggressive behavior (Good Behavior Game) or negative outcomes from parent death (Family Bereavement Program) that found these interventions also reduced suicide ideation and attempts up to 15 years later; (b) present a framework for how communities may consider a matrix of programs to prevent youth and young adult suicide that address different risk and demographic factors (school disconnection, alcohol use, LGTB discrimination), by different contexts (family, school, peers, community), to build in known protective processes for children and youth; (c) propose recommendations to strengthen youth suicide prevention at a community level, including the need for studies that examine regional prevention efforts and for interventions that focus on social systems as the unit of focus. New findings will be presented on characteristics of youth social networks that account for variation in suicide attempts across 40 high schools, and implications for creating population preventive interventions.

17. PSYCHOLOGICAL MODELS OF SUICIDE

Chair: Alan Apter, Schneiders Childrens Medical Center of Israel

Overall Abstract: Suicidal behavior results from a complex interplay of many factors, and involves psychological processes that evolve over time. Although many risk factors have been identified, the causes of suicidal behavior are not fully understood. A comprehensive model of suicidal processes and behavior is essential for the assessment of risk for suicide and for designing interventions. The symposium will describe recent developments in theoretical, clinical, and empirical psychological science about the emergence of suicidal thoughts and behaviors, and emphasize the central importance of psychological factors. We focus on contemporary models based on empirical research that address the psychological mechanisms underlying the development of suicidal behavior. All have been tested and found to have empirical support, which we will present. These psychological models may have important implications for research and the development of methods of suicide prevention. Prof. O'Connor, will present findings from a selection of empirical present studies derived from the Integrated Motivational–Volitional (IMV) Model of Suicidal Behaviour to illustrate how psychological factors increase suicide risk. Prof. Klonsky will present a new theory of suicide rooted in the 'ideation--to--action' framework: the Three- Step Theory (3ST). He will describe the theory and its rationale, and review current evidence for the theory, including challenges and directions for scientifically testing the theory. Dr. Barzilay will present multinational large-scale prospective examination of Joiner's interpersonal theory of suicide (IPTS) among European adolescent, and will discuss the theoretical and clinical implications of the findings. Finally, Prof. Apter will discuss a series of observations comparing severe non-fatal suicide attempters with low lethal attempters which suggest "the Impossible

Situation" framework when inability to communicate stress leads to severe suicidal behaviors.

17.1 PSYCHOLOGICAL PROCESSES AND SUICIDAL BEHAVIOUR

Rory O'Connor*[1]

[1]University of Glasgow

Suicide and attempted suicide are major public health concerns with complex aetiologies which encompass a multifaceted array of risk and protective factors. There is growing recognition that we need to move beyond psychiatric categories to further our understanding of the pathways to both. As an individual makes a decision to take their own life, an appreciation of the psychology of the suicidal mind is central to suicide prevention. Another key challenge is that our understanding of the factors that determine behavioural enaction (i.e., which individuals with suicidal thoughts will act on these thoughts) is limited. Although a comprehensive understanding of these determinants of suicidality requires an appreciation of biological, psychological and social perspectives, the focus in this presentation is primarily on the psychological determinants of self-harm and suicide. The Integrated Motivational–Volitional (IMV) Model of Suicidal Behaviour (O'Connor, 2011) provides a framework in which to understand suicide and self-harm. This tripartite model maps the relationship between background factors and trigger events, and the development of suicidal ideation/intent through to suicidal behaviour. I will present findings from a selection of empirical studies derived from the IMV model to illustrate how psychological factors increase suicide risk and what can be done to ameliorate such risk. The implications for the prevention of self-harm and suicide will also be discussed.

17.2 THE THREE--STEP THEORY (3ST) OF SUICIDE: EVIDENCE UPDATE, SCIENTIFIC CHALLENGES, AND NEXT STEPS

E. David Klonsky*[1]

[1]University of British Columbia

Individual Abstract Klonsky and May (2014) suggested that an 'ideation--to--action' framework should guide all suicide theory, research, and prevention. From this perspective, 1) the development of suicide ideation and 2) the progression from ideation to suicide attempts should be viewed as distinct processes with distinct explanations. The framework is important because most people with suicidal ideation never attempt, and most oft-cited risk factors for suicide – including depression, hopelessness, most psychiatric disorders, and even impulsivity – predict ideation but do not distinguish attempters from ideators without attempts. This presentation addresses a new theory of suicide rooted in the 'ideation--to--action' framework: the Three-Step Theory (3ST; Klonsky & May, 2015). Specifically, I will a) describe the theory and its rationale, b) review current evidence for the theory, c) discuss challenges for scientifically testing the theory, and d) suggest important future directions for the operationalization and evaluation of the theory's core tenets and constructs.
The 3ST has three primary tenets. First, suicidal desire results from the combination of pain (usually psychological pain) and hopelessness. Second, among those experiencing both pain and hopelessness, connectedness is a key protective factor against escalating ideation. Third, the theory views the progression from ideation to attempts as facilitated by dispositional, acquired, and practical contributors to the capacity to attempt suicide. The theory not only improves understanding of suicide, but provides an organizing framework the broad array of

previously identified suicide biological and psychology risk factors, and suggests mechanisms by which these factors confer risk for suicide.
Initial evidence supporting the theory's tenets was drawn from a study of a large online US-based sample (Klonsky & May, 2015), as well as studies of motivations for suicide (May & Klonsky, 2013; May et al., 2016) and of events, thoughts, and feelings that precede lethal and near-lethal suicide attempts (Wintersteen, 2014). This presentation will review additional and more recent evidence for the 3ST tenets, including a replication of May and Klonsky (2015) conducted in a UK-based sample (Dhingra et al., accepted pending revision), as well as a recent research review finding accumulating evidence that capability for suicide distinguishes attempters from ideators (Klonsky, Qiu, & Saffer, 2017).
Despite accumulating evidence in support of the 3ST, several scientific challenges and next steps must be addressed if the theory is to be more fully validated and applied. These include the need to: (a) distinguish suicidal desire (relevant for Step 1) from the broader construct of suicidal ideation, which can include suicidal plans and perceptions of suicide capability (relevant for Step 3); (b) delineate and measuring the construct of overwhelming pain, including its differentiation from other negative emotions; (c) develop a more comprehensive measurement of disposiational, acquired, and practical contributors to the capacity to attempt suicide; (d) better operationalize and test the model's key conceptual tenets and constructs, including the hypothesized interaction between two highly correlated variables (pain and hopelessness) in the prediction of suicidal desire, and the hypothesis (Step 2) that suicide ideation escalates when pain exceeds connectedness, and (e) conduct prospective tests (both short- and long-term) of the theory's key tenets.
Overall, the 3ST appears to provide a useful and accurate explanation for suicidal thoughts and behaviors that has promise for prevention and clinical applications. But there is more work to be done.

17.3 PREDICTION OF SUICIDAL BEHAVIOR IN ADOLESCENTS: JOINER'S INTERPERSONAL THEORY

Shira Barzilay*[1], Alan Apter[2]

[1]Icahn School of Medicine at Mount Sinai, [2]Schneider Children's Medical Center
Shira Barzilay

Background: The interpersonal theory of suicide (IPTS) proposes that two interpersonal processes thwarted belongingness and burdensomeness combine together to produce suicidal ideation. When suicidal ideation is facilitated or habituated by acts of self harm suicidal acts occur. We aimed to test IPTS predictions in a large multi-national sample of adolescents in a prospective manner.
Methods: Data was collected as part of the Saving and Empowering Young Lives in Europe (SEYLE) study. 7,738 pupils from ten EU countries who completed baseline, 3-month and 12-month follow-ups were included in this study. A self-report questionnaire was used to measure perceived burdensomeness, thwarted belongingness, health risk behaviors (HRB), direct self-injurious behaviors (D-SIB), and suicidal ideation and attempts. We used multilevel mixed effect logistic regression analyses to examine univariate and multivariate associations between baseline predictors and incident suicide attempt at 3- and 12-months.
Results: In line with IPTS predictions, thwarted peer/parental belongingness and burdensomeness predicted suicide attempts during follow up, but not beyond the effect of

suicidal ideation. Acquired capability for self-harm, measured by HRB and D-SIB, predicted incident suicide attempts beyond suicidal ideation. This effect operated independently from suicidal ideation rather than in interaction with it.
Conclusions: Direct and indirect acts of self-harm are important predictors in the pathway of suicide attempts in adolescents, regardless of suicidal ideation. Suicide prevention strategies are encouraged to attend to distinguished risk groups, one associated with suicidal ideation and interpersonal vulnerabilities and the other with self-harm practices.

17.4 DEATH WITHOUT WARNING –THE IMPOSSIBLE SITUATION

Alan Apter*[1]

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This model is based on a series of investigations based on looking at the different presentations of suicidal behavior in different community and clinical situations. The original observations were made on a series of psychological autopsies on young soldiers who had committed suicide while serving in the military. On comparison to a group of soldiers who had attempted suicide several differences were noted –the main one being that the suicide group seemed to be private and introverted and had difficulty in asking for help. Consequently, in a series of observations comparing severe non-fatal suicide attempters with low lethal attempters we found similar findings. There were no differences between the groups on severity of depression or in measures of mental pain but the severe attempters were much more likely to show difficulties in communication. This was shown both on cross section and then on a prospective follow up.
We thus hypothesize that when an individual is faced with a seriously stressful situation or feelings of inner despair but is unable to communicate this either verbally or by self-injurious acts an impossible situation is created and serious suicide attempt is made.
We argue that this model may explain some of the gender differences in suicide (such as the gender paradox in high income countries) and some epidemiological differences (such as the differences in suicide rates between southern and northern Europe

18. WORKING WITH PSYCHIATRICALLY HOSPITALIZED ADOLESCENTS: FROM ASSESSMENT TO INTERVENTION

Chair: Christianne Esposito-Smythers, George Mason University

Overall Abstract: Adolescents who are psychiatrically hospitalized for acute suicidality represent a particularly high risk group for future suicidal behavior. While hospitalization may reduce acute suicide risk for many youth, a substantial number of youth report continued suicidality post-discharge. Thus, it is very important to understand stressors associated with more chronic suicidality as well as how to effectively intervene with this very high-risk adolescent population. The primary purpose of this symposium is to present research on the nature of stressors experienced by more chronically suicidal youth as well as interventions designed to address suicide risk during the hospital stay and after discharge from the hospital. Dr. Liu will present results from a longitudinal study that examines the relation between chronic adolescent suicidal behavior and nature of stressors experienced post-discharge from a psychiatric inpatient unit. Dr. Wolff will present results from a study designed to develop and evaluate a brief cognitive-behavioral inpatient intervention for adolescents who are psychiatrically hospitalized. Dr. O'Brien will present preliminary results from a randomized clinical trial designed to test a motivational enhancement inpatient intervention for

adolescents psychiatrically hospitalized for a suicide attempt who also use alcohol. Finally, Dr. Esposito-Smythers will present results from a large randomized clinical trial that tested an intensive cognitive-behavioral intervention for depressed adolescents hospitalized for suicidality, who also had another major risk factor, either a suicide attempt, non-suicidal self-injury, and/or a substance use disorder. Dr. Spirito will serve as the discussant for this symposium and lead the question and answer period.

18.1 SUICIDAL BEHAVIOR AND STRESS GENERATION IN ADOLESCENT PSYCHIATRIC INPATIENTS: A CONTEXTUAL THREAT APPROACH

Richard Liu*[1], Anthony Spirito[1]

[1]Alpert Medical School, Brown University

One of the most robust predictors of future suicide attempts (SAs) in the empirical literature is a past history of this behavior. Indeed, in one recent meta-analysis, a medium-to-large pooled effect was observed for this relationship across a median follow-up period of two years. A potential mechanism underlying the recurrence of SA is stress generation, the tendency for certain individuals to experience higher rates of dependent stress (i.e., stressors that are at least in part influenced by their own behaviors), but not to differ in rates of independent stress (i.e., stressors that occur outside the influence of their behavior). This higher rate of dependent stress, particularly interpersonal dependent stress, was originally proposed to account for the high rate of recurrence of depression. Its applicability to SA has yet to be evaluated. Given the well documented role of life stress, particularly within interpersonal domains, in precipitating SAs, the possible relevance of stress generation to SA has potential to advance our understanding of the etiology of this behavior and inform treatment.

The current study evaluated the relevance of stress generation in a sample of 99 adolescent psychiatric inpatients followed for 6 months. Participants completed the Columbia-Suicide Severity Rating Scale, Suicidal Ideation Questionnaire Jr., and Children's Depression Rating Scale-Revised at baseline, and the UCLA Life Stress Interview at follow-up. Consistent with the stress generation hypothesis, lifetime number of SAs prospectively predicted higher rates of dependent stress ($b=.27$, $p<.05$, $d=.55$, $BF10=3.93$), but not independent stress ($b=.06$, $p=.33$, $d=.23$, $BF01=1.48$), after sex, age, suicidal ideation and depression were covaried. This association was specific to interpersonal ($b=.25$, $p<.05$, $d=.53$, $BF10=3.46$), but not non-interpersonal ($b=.02$, $p=.43$, $d=.18$, $BF01=1.65$), dependent stress.

These results have implications for treatment. Unlike independent stress, dependent stress is modifiable, and thus it should be possible to reduce it occurrence. Adolescents with a history of suicidality may benefit from behavior modification strategies aimed at stress generation.

18.2 EVALUATION OF THE COPES PROGRAM: AN EMPIRICALLY-INFORMED PSYCHOSOCIAL INTERVENTION ON AN ADOLESCENT PSYCHIATRIC INPATIENT UNIT

Jennifer Wolff*[1], Elisabeth Frazier[2], Alysha Thompson[2], Richard Liu[1], Jeffrey Hunt[2]

[1]Alpert Medical School, Brown University, [2]Bradley Hospital

Although suicidal adolescents are often hospitalized, there is a paucity of research examining the effectiveness of psychosocial approaches in inpatient settings. Studies of youth discharged from inpatient treatment show high rates of re-hospitalization and repeat psychiatric crises. The feasibility and clinical utility of psychosocial treatments for suicidality

in inpatient settings have yet to be empirically determined. Moreover, providing quality care in this setting has become increasingly challenging given reduced lengths of hospitalization, increased rates of readmissions, and increased rates of self-injury and suicidality among youth.
The present study aimed to adapt a manualized treatment for suicidal youth for use with acute adolescent inpatients with a broad range of psychopathology within the time constraints of a brief hospital stay. The study assessed whether implementation is associated with reduction in acute psychiatric service utilization over a 12-month period. The sample included 463 patients (64.58% female) between the ages of 12 and 16 (mean age of 14.45 (SD=1.20) who were admitted to a psychiatric facility between April 2015 and March 2016. The mean number of diagnoses was 2.38 (SD = 1.48). The average length of stay was 9.34 days (SD = 8.79).
Results showed that 98.70% of patients completed at least one of the treatment modules and 42.98% completed all four components. The number of modules completed was not related to factors commonly cited as reducing the ability to provide empirically-informed treatment in inpatient settings (i.e. age, sex, length of stay, and diagnoses including depression, mania, attention deficit/hyperactivity disorder (ADHD), anxiety, psychosis, conduct problems, PTSD/acute stress, and eating disorders). Conduct disorder was the only diagnosis associated with lower completion rate of any module (Enhancing Life) (OR=.62, 95% CI=.42-.90). The greater number of modules completed predicted a longer time to subsequent intensive service contact after age, sex, length of hospital stay, and number of diagnoses were co-varied (OR=.796, 95% CI=.690-.918). Completion of the Enhancing Life (OR=.689, 95% CI=.515-.923) and Safety Plan (OR=.649, 95% CI=.450-.936) modules were also significantly predictive of longer time to intensive services utilization after accounting for the same covariates suggesting a protective function.
Overall, findings suggest the intervention is feasible to implement regardless of common barriers in an inpatient psychiatric setting, such as complex psychopathology and brief duration of hospitalization. Completion of treatment modules significantly reduces risk for subsequent emergency intensive service utilization, suggesting this intervention is an effective method for reducing acute clinical events and potentially improving cost-effectiveness of intensive psychiatric services. Implications and directions for future research will be discussed.

18.3 A BRIEF ALCOHOL INTERVENTION FOR PSYCHIATRICALLY HOSPITALIZED SUICIDAL ADOLESCENTS

Kimberly O'Brien*[1], Laika Aguinaldo[2], Christina Sellers[3], Anthony Spirito[4]

[1]Education Development Center, [2]Boston Children's Hospital/Norfolk State University, [3]Boston College School of Social Work, [4]Alpert Medical School, Brown University

There is significant variability in the delivery of substance use assessment and counseling across psychiatric inpatient units, and it is frequently neglected when the adolescent's suicide risk is the primary focus of treatment. Given the potentially significant role alcohol could play in subsequent suicidal behaviors, greater attention to alcohol use in adolescent inpatient psychiatric units is critical. The purpose of this study was to test the feasibility and acceptability of a brief alcohol intervention with suicidal adolescent inpatients who report past month alcohol use. We also assessed preliminary effects on alcohol use, suicide ideation, and attempts.

In our trial, 39 adolescents (Mage=15.63; 80% female, 65% white) and their families were recruited from an urban inpatient psychiatric hospital and randomly assigned to the experimental intervention (EXP) or treatment as usual (TAU), stratifying by gender and frequency of alcohol use. At baseline and 3-month follow-up, alcohol use was measured by the Timeline Follow-back Interview, suicidal ideation by the Suicidal Ideation Questionnaire, and suicide attempts by the Columbia-Suicide Severity Rating Scale. Adolescents randomized to EXP received an individual session exploring alcohol use as a risk factor for continued suicidal thoughts and behaviors in order to build the adolescent's motivation to reduce or stop their alcohol use and to create a complementary change plan. A subsequent family session, where the adolescent and parent discussed the change plan with the interventionist, was conducted to strengthen the adolescent's self-efficacy and commitment to the change plan as well as the parent's ability to support the adolescent in their plan to reduce or stop drinking. Adolescents in EXP were given an exit interview and session evaluation form to assess feasibility and acceptability of the intervention.
Of the adolescents, 19 were randomized to EXP and 20 to TAU. All 19 in EXP completed the individual intervention (M=75 minutes) and family intervention (M=20 minutes) during their inpatient hospitalization. All 19 adolescents expressed satisfaction with the intervention in their exit interviews and session evaluation forms, and created a change plan. Adolescents in EXP drank significantly less alcohol at 3 month follow-up (M=11.69, SD=28.47) relative to baseline (M=41.56, SD=43.40), $Z = -2.90$, $p < .05$. Adolescents in TAU also drank less at follow-up (M=6.37, SD=14.58) compared to baseline (M=30.90, SD= 53.75), $Z= -3.46$, $p < .05$. For both groups, there was a significant decrease in suicide ideation from baseline (MEXP=87.42, SDEXP=30.47; MTAU=106.64, SDTAU=37.30) to 3 month follow-up (MEXP=55.67, SDEXP=34.86; MTAU=53.57, SDTAU=35.93; $tEXP (11)=3.20$, $p < .05$; $tTAU (13)=5.82$, $p < .05$). In total, there were 18 reported attempts in EXP (73.7%) and 19 in TAU (72.2%) at baseline, and zero attempts at 3 month follow up for EXP and TAU. Overall, results indicated that a brief alcohol intervention is feasible and acceptable to psychiatrically hospitalized suicidal adolescents. Adolescents who received the intervention reduced their amount of alcohol use and level of suicide ideation at 3- month follow-up. A larger fully powered study, and a longer follow-up period, will be needed to determine whether this brief alcohol intervention results in added benefit beyond standard care and/or whether certain patient characteristics moderate outcomes.

18.4 INTEGRATED COGNITIVE-BEHAVIORAL TREATMENT FOR SUICIDAL YOUTH: RESULTS OF A RANDOMIZED CLINICAL TRIAL

Christianne Esposito-Smythers*[1], Jennifer Wolff[2], Elisabeth Frazier[3], Richard Liu[4], Alysha Thompson[3], Jeffrey Hunt[3], Kerri Kim[2], Rebecca Uth[4], Heather MacPherson[3], Shirley Yen[4], Daniel Dickstein[5], Anthony Spirito[4]

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Adolescents who are psychiatrically hospitalized for acute suicide risk are a particularly difficult group to treat. They often have multiple comorbid conditions, a significant trauma history, complicated familial/social networks, and chronic suicidality. As a result, relatively few clinical trials have been conducted with this population and there is no clear best-practice

outpatient treatment option. The purpose of the present study was to test an integrated cognitive-behavioral outpatient treatment protocol (I-CBT) for depressed suicidal adolescents who were psychiatrically hospitalized for acute suicide risk and have a history of a suicide attempt, non-suicidal self-injury (NSSI), and/or a substance use disorder. These conditions were selected for inclusion because they commonly co-occur among psychiatrically hospitalized youth and increase risk for future suicide attempts.

I-CBT builds on our prior successful CBT treatment protocol for suicidal youth with a co-occurring substance use disorders (Esposito- Smythers, Spirito, Hunt, Kahler, & Monti, 2011). This revised version of I-CBT has a greater parent training and family focus and was designed to better address the severe affect dysregulation common to suicidal youth with NSSI. I-CBT is manualized and includes individual adolescent, individual parent, and family modules. For each family, two therapists are assigned, one who works individually with the adolescent and another who works with the parents and leads family sessions. Some individual sessions are "core" sessions that all families receive, and others are "supplemental" and only used as needed. All individual modules can be used with the adolescent or parent to address individual skills deficits (e.g., in affect regulation). Parents also have modules specifically designed to improve parenting skills. Sessions are 1 hour in length and have common components, including a safety check-in, homework review, agenda setting, new skills introduction/skills practice, agenda discussion, homework assignment, and parent–teen check-in.

Participants (n = 147) were randomized to I-CBT or standard outpatient care (SOC). The sample was predominantly female (76%), White (84%), and Non-Hispanic (82%). Approximately 66% of adolescents reported a prior suicide attempt (mean age of first attempt = 13), 29% more than one prior suicide attempt, 90% a history of non-suicidal self-injury (NSSI), and 38% a substance use disorder. The Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2007) was used to assess for suicide attempts. A suicide attempt was defined as a self-injurious act committed with any non-zero intent to die as a result of the act. There did not have to be any injury, just the potential for injury.

Within the I-CBT relative to SOC condition, percentage of participants who made a suicide attempt or were re-hospitalized for a suicide attempt between baseline and 6-months (attempt: 15% vs. 19%; hospitalization: 8% vs. 14%), and 6-12 months (attempt: 9% vs. 6%; hospitalized: 5% vs. 3%) was comparable. However, I-CBT relative to SOC had a small to medium (d = .41), though non-statistically significant, effect on lethality of suicide attempts. Of the 42 total attempts coded for lethality, those in I-CBT relative to SOC reported fewer attempts resulting in "moderate to severe" physical injury (22% vs. 38%).

Despite the use of a comprehensive integrated protocol, there remains a percentage of this very high risk population that do not adequately respond to intensive treatment. Characteristics of these non-responders will be described and suggestions for other approaches that may result in better outcomes for these difficult to treat patients will be discussed.

Co-Chair: Anthony Spirito, Alpert Medical School, Brown University

19. NOVEL APPROACHES TO UNDERSTANDING AND PREVENTING SUICIDE

Chair: Michael Grunebaum, New York State Psychiatric Institute

Overall Abstract: While much is known about distal risk factors for suicidal ideation and behavior, little is understood about mechanisms, prediction, and treatment of these

challenging clinical problems on the individual patient level. In this symposium, speakers will present data from a range of studies involving novel methods for collecting, analyzing, and treating suicidal ideation or behavior. Presentations will include findings from studies involving ecological momentary assessment (EMA) methods of suicide-related data collection, network analysis of suicide attempter phenotypes, use of app and web-based interventions to reduce suicidal risk, and neurocognitive and biomarker analyses from a clinical trial of ketamine for rapid reduction of suicidal thoughts in depressed patients with clinically significant suicidal ideation.

19.1 KETAMINE FOR RAPID RELIEF OF SUICIDAL THOUGHTS IN DEPRESSION: COGNITION AND EXPLORATORY BIOMARKERS

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Background: Suicidal behavior is usually associated with depression, but antidepressants generally take weeks to have an effect, a third or fewer patients' depression remits, and less than half have even 50% symptom relief with initial standard medication. Studies show reduction in suicidal thoughts after treatment with the NMDA receptor antagonist ketamine, but most studies have not recruited suicidal patients. Ketamine's mechanism of action is thought to involve increased Brain Derived Neurotrophic Factor (BDNF) and rapid synaptogenesis in brain areas.
Methods: We conducted a randomized, midazolam-controlled trial of ketamine for relief of clinically significant suicidal ideation in major depressive disorder (MDD). Adults (N = 80) with current MDD and score ≥4 on the Beck Scale for Suicidal Ideation (SSI) were randomized to adjunctive ketamine or midazolam infusion. Primary outcome was SSI score at Day 1. Participants completed neurocognitive and saliva cortisol awakening response (CAR) tests at baseline and Day 1. A subgroup (N=53) provided blood samples pre- and post-infusion to measure ketamine, its metabolites norketamine and dehydro-norketamine), and BDNF.
Results: Neurocognition: Cognitive improvement was greater after ketamine than midazolam (improvement of .32 □ .45 SD across the battery vs. .10 □ .49 SD in midazolam; infusion day by drug interaction, F[1,76]=4.01, p=.049). Improvement was most pronounced on measures of reaction time (F[1,75]=4.21, p=.044), delayed memory recall (F[1,79]=5.91, p=.017), and Stroop interference (F[1,76]=3.67, p=.059). Better baseline memory on a list learning task correlated with decline in HDRS score after ketamine (r= -.39, p=.016) but not midazolam (r = +.12, p=.465). Patients showed greater improvement in response speed, retention of information, and cognitive control after ketamine.
Cortisol Awakening Response: The midazolam group had a non-significant increase in CAR of 13% (p=0.359). The ketamine group had a non-significant decrease in CAR of 12% (p=0.287). These changes did not differ (p=0.165). Interaction terms between group and baseline cortisol were tested for both awakening and 30-minute values, but neither were significant (p=0.298).

Brain Derived Neurotrophic Factor: We compared the difference in Ln(BDNF) level (post-minus pre-infusion) between the randomized ketamine and midazolam infusions. Results were non-significant for both plasma (p=0.418) and serum (p=0.225).
Non-responders to midazolam received an open ketamine infusion with BDNF reassessed immediately after. Paired t-tests compared Ln(BDNF) pre- and post-open ketamine infusion within subject (plasma N=22; serum N=26). There was a non-significant decrease of Ln(BDNF) in serum (p=0.12) and a significant decrease in plasma (p=0.001).
Ketamine, Norketamine, Dehydro-norketamine Levels:
Post-infusion plasma ketamine and metabolites were not correlated with post-infusion SSI, HDRS-17 or HDRS-24 scores nor with change in these clinical ratings from baseline to Day 1. There was a trend-level association of post-infusion dehydro-norketamine with change in HDRS-24 (N=26, r=-0.381, p=0.055).
Conclusions: Baseline memory was positively and selectively associated with ketamine response. Reaction time, delayed memory recall, and cognitive control improved more after ketamine than midazolam. Memory and cognitive control deficits have been implicated in suicide attempt risk. Results of the assessments of cortisol awakening response, plasma and serum BDNF, and plasma ketamine and metabolites were overall non-significant.

19.2 NETWORKANALYSIS: A NOVEL APPROACH TO UNDERSTAND SUICIDAL BEHAVIOUR

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Although suicide is a major public health issue worldwide, we understand little of the onset and development of suicidal behaviour. Suicidal behaviour is argued to be the end result of the complex interaction between psychological, social and biological factors. Epidemiological studies resulted in a range of risk factors for suicidal behaviour, but we do not yet understand how their interaction increases the risk for suicidal behaviour. A new approach called network analysis can help us better understand this process as it allows us to visualize and quantify the complex association between many different symptoms or risk factors. A network analysis of data containing information on suicidal patients can help us understand how risk factors interact and how their interaction is related to suicidal thoughts and behaviour. A network perspective has been successfully applied to the field of depression and psychosis, but not yet to the field of suicidology. In this talk I will present the results of network analysis applied on previously collected data from a sample of 366 patients who were admitted to a Scottish hospital following a suicide attempt. Network analysis showed that the desire for an active attempt was found to be the most central, strongly related suicide symptom. Of the 19 suicide symptoms that were assessed at baseline, 10 symptoms were directly related to repeat suicidal behaviour. Results from new analysis on larger databases will also be presented and discussed. Future studies and challenges will be addressed.

19.3 ECOLOGICAL AND AMBULATORY ASSESSMENT OF SUICIDE RISK: PRELIMINARY EVIDENCE AND FUTURE DIRECTIONS

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The U.S. suicide rate has increased dramatically in the past decade. While studies have identified modestly effective distal predictors (e.g. age, gender, psychiatric diagnosis, etc.) of suicidal ideation (SI) and behavior (SB), relatively little is understood about the proximal phenomenology of affect, behavior, and cognition associated with suicide. This limited understanding of the context in which suicide occurs is one factor that likely limits our ability to develop effective programs of suicide prevention and intervention. However, advancements in technology, namely ecological momentary assessment (EMA) and related methods, have made it feasible to collect these data providing a critical opportunity to better understand suicidal risk.

Here, we report preliminary EMA findings from two large-scale (target N = 400) projects exploring novel genetic, psychophysiological, cognitive, and affective risk factors for suicide aligned with the NIMH Research Domain Criteria in a high-risk psychiatric inpatient population. Participants include patients hospitalized for a suicide attempt (SA), patients experiencing SI sufficiently severe to necessitate hospitalization, and non-suicidal psychiatric controls. Data were collected at index hospitalization, during a three-week post-hospitalization EMA period, and 3-weeks and 6-months post-hospitalization.

Preliminary findings suggest that nearly two thirds (61.4%) of episodes of increased SI and SB identified through EMA are associated with an identifiable stressful life situation, with the majority of those events representing social/relational conflict (63%) or health concerns (13.6%). Importantly, while reported SI was highest during stressful life events, elevated levels of SI were detectable in the hours (>3) following the event, suggesting persistent elevated risk. Consistent with our prior work, these episodes of increased suicide risk were associated with increased negative, $F(1,42) = 10.60$, $p = .002$, and angry, $F(1,42) = 4.84$, $p = .03$, emotions, taking the form of a quadratic curve (i.e. anger increasing prior to the event, peaking at the event, and fading after). Critically, the ratio of positive to negative affect in the EMA sample immediately prior to the episode of increased SI or SB predicted the number of SAs at a 6-month follow up, $r = .43$. These preliminary findings suggest that there are potential behavioral and affective signals that predict episodes of increased suicide risk as well as future suicide attempts. Analyses of these data are ongoing, and we will discuss the clinical implications of our findings as well as the future directions of this work.

19.4 DIGITAL WEBSITES FOR SUICIDE PREVENTION

Helen Christensen*[1], Brejge Van Spijker[1], Andrew Mackinnon[1], Aliza Werner-Seidler[1], Lee Ritterband[2], Frances Thorndike[2], Ad Kerkhof[3], Philip Batterham[4], Bridianne O'Dea[5]

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Background: Digital technologies have rarely been used in suicide prevention to deliver psychological interventions. Yet, these technologies could be cost effective and targeted – through directed applications to those who identify with suicidal thoughts, in the identification of at risk individuals in school environments, or via programs to community members who are seeking help for insomnia. In this study, I briefly report the findings of three studies undertaken at Black Dog Institute: 12 month follow up data of a RCT of a CBT

self-help program (LWDTs) delivered to those with suicidal ideation; an 18 month follow-up of the GoodNight trial, and the development of a new digital service which screens for suicide ideation in high schools in Australia.
Methods/design: The first two trials were self-help RCT which collected data each on 400 (LWDTs) or 1150 (GoodNight) people and compared outcomes to an attention placebo controlled groups. The school based intervention (Smooth Sailing) is based on a single arm intervention trial in 3 schools in rural Australia.
Results: Suicide ideation reduced in the LWDT intervention, but not significantly more than the placebo controlled condition. Suicide ideation was significantly lower in the Insomnia intervention compared to the control condition in the GoodNight trial, although the effects were present only at 6 weeks. However, depression outcomes were consistently lower over 18 months. Smooth Sailing identified kids at risk, most of whom were known to the school, and who were provided with assistance.
Discussion: Apps and websites can be effective in reducing suicide risk. However, we need to consider the settings, context and target groups in which these are used.

20. NOVEL STRESS RELATED BIOMARKERS OF SUICIDAL BEHAVIOR

Chair: Jussi Jokinen, Umeå University

Overall Abstract: In this symposium proposal 'Novel stress related biomarkers of suicidal behavior' we will present four studies reporting new findings on neuroendocrine and epigenetic changes related to suicidal behavior.
In the first presentation, we report for the first time that a group of medication-free suicide attempters had significantly higher plasma levels of free-circulating mitochondrial DNA (mtDNA) compared to healthy controls. This peripheral index is consistent with increased cellular or mitochondrial damage. Among the suicide attempters, there was a direct correlation between mtDNA and cortisol levels after a dexamethasone challenge, suggesting a link between mitochondrial dysfunction and HPA-axis hyperactivity in suicidal individuals. Additional analyses of mtDNA in cerebrospinal fluid (CSF) samples from suicide attempters, in order to better understand how these novel findings are related to corresponding changes in the central nervous system, will also be presented.
In our second presentation, we show data on CSF insulin and glucagon levels in medication free suicide attempters and healthy controls. Patients had higher insulin- and lower glucagon-levels in plasma and CSF compared to controls. These findings extend prior reports that higher insulin and lower glucagon levels are associated with suicidal behavior pointing towards a potential autonomic dysregulation in the control of insulin and glucagon secretion in suicidal patients. Further, both insulin and glucagon levels were associated with interpersonal violence in study participants.
The third presentation focuses on interactions between Brain-derived neurotrophic factor (BDNF) and the HPA-axis, and how these neurobiological systems relate to clinical correlates of suicidal behavior. Among female suicide attempters, we found that low BDNF levels are associated with HPA-axis hyperactivity; a biological trait previously associated with increased risk for completed suicide. Furthermore, BDNF Val66Met gene polymorphism was associated with avoidant coping strategies and lower BDNF plasma concentrations were associated with personality traits reflecting higher levels of impulsiveness.

In the fourth presentation, we report findings of HPA-axis coupled CpG-sites, in which modifications of the epigenetic profile are associated with severity of suicide attempt. Inclusion criteria for the high-risk group included a violent suicide attempt method, a later completed suicide or a high score (>6) on the Freeman scale measuring suicide intent. The methylation state of two Corticotropin releasing hormone (CRH) associated CpG sites (cg19035496 and cg23409074) were significantly hypomethylated in the high-risk group ($p<0.001$). In a validation cohort, cg19035496 was confirmed to be hypomethylated in subjects with a high general psychiatric risk score using DAWBA measurements. Methylation levels of cg23409074 were further positively correlated with gene expression of the CRH gene in an independent cohort of 11 healthy male subjects and the methylation levels at both cg23409074 and cg19035496 were significantly correlated between blood and four different brain regions. Our results show epigenetic and transcriptional changes in the CRH gene related to severity of suicide attempt and a general psychiatric risk score in adolescents.
This symposium will highlight some novel aspects of suicide neurobiology with the goal to better understand suicidal behaviour and ultimately improve preventive and therapeutic measures.

20.1 MITOCHONDRIAL DNA LEVELS ARE INCREASED IN SUICIDE ATTEMPTERS AND ASSOCIATED WITH HPA-AXIS HYPERACTIVITY

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Background: Human cells contain multiple mitochondria and, in turn, each mitochondrion contains multiple copies of its own genome, the mitochondrial DNA (mtDNA), which encodes 37 genes essential to energy production. Accelerated cellular ageing, caused by various environmental stressors may lead to apoptosis, mitochondrial dysfunction and leakage of mtDNA from damaged cells into the bloodstream, potentially causing downstream pathology including systemic inflammation. Animal studies have shown that chronic stress exposure leads to mitochondrial damage and dysfunction in brain regions involved in depression and suicidal behaviour, such as the hippocampus and the hypothalamus. Increased blood levels of leukocyte mtDNA have been associated with stressful life events in humans and with a stress-paradigm and corticosteroid administration in mice. No previous studies have investigated mtDNA levels in suicidal individuals.
Methods: We quantified mtDNA, using qPCR, in cell-free plasma samples from 37 recent suicide attempters, who had undergone a dexamethasone suppression test (DST), and 37 healthy controls. None of the subjects had any major somatic illnesses and the suicide attempters did not receive any antidepressants or antipsychotics during a washout-period (mean ± SD: 12 ± 13 days) prior to blood sampling and the DST. The majority of the suicide attempters had a mood disorder as principal diagnosis and drug overdose was the most commonly used suicide method. We hypothesized that mtDNA would be elevated in the suicide attempters and associated with hypothalamic pituitary adrenal (HPA)-axis hyperactivity.
Results: Suicide attempters had significantly higher plasma levels of mtDNA compared to healthy controls at all time point (pre- and post-DST). These effects were very large with almost non-overlapping groups and Cohen's d ranging from 2.55-4.01 (all p-values <2.98E-

12). Pre-DST plasma levels of mtDNA were significantly and positively correlated with post-DST cortisol levels (rho=0.49, p<0.003). MtDNA levels were not significantly associated with number of wash-out days, sample storage time, depression severity, the use of a violent suicide method or a history of suicide repetition.
Discussion: This is the first study to show that a group of medication-free suicide attempters have significantly higher plasma levels of free-circulating mtDNA compared to a group of healthy controls. This peripheral index is consistent with increased cellular or mitochondrial damage. Among the suicide attempters, there was a direct correlation between mtDNA and cortisol levels after a dexamethasone challenge, suggesting a link between mitochondrial dysfunction and HPA-axis hyperactivity in suicidal individuals. The specific cells and tissues contributing to plasma levels of free-circulating mtDNA are not known, as is the specificity of this finding for suicide attempters. This will be further discussed during the symposium. Also, we are currently planning additional analyses of mtDNA in cerebrospinal fluid samples from suicide attempters, in order to better understand how these novel findings are related to corresponding changes in the central nervous system.

20.2 INSULIN AND GLUCAGON IN PLASMA AND CEREBROSPINAL FLUID IN SUICIDE ATTEMPTERS AND HEALTHY CONTROLS

Marie Bendix*[1], Kerstin Uvnäs-Moberg[2], Maria Petersson[2], Marie Åsberg[2], Jussi Jokinen[1]

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Dysregulation of carbohydrate metabolism has been associated with mental disorders and related behaviors such as suicidality and violence. We hypothesized increased peripheral and central levels of insulin and decreased levels of glucagon in patients after suicide attempt compared to healthy controls. We also expected an association between these hormonal changes and a history of violent behavior.
Twenty-eight medication-free patients (10 women, 18 men), hospitalized after suicide attempt, and 19 healthy controls (7 women, 12 men) were recruited with the aim to study risk factors for suicidal behavior. Psychological/psychiatric assessment was performed with SCID I and II or the SCID interview for healthy volunteers respectively, the Karolinska Interpersonal Violence Scale (KIVS) for assessment of lifetime violence expression behavior, the Montgomery-Åsberg-Depression-Scale (MADRS) and the Comprehensive Psychological Rating Scale (CPRS) for symptomatic assessment of depression. Fasting levels of insulin and glucagon were measured in plasma (P) and cerebrospinal fluid (CSF).

P- and CSF- insulin were significantly higher and P- and CSF- glucagon were significantly lower in patients compared to controls. After adjusting for age and BMI these associations remained significant for P-insulin (p=0.011) and CSF-insulin (p=0.0001). After adjustment for BMI, CSF-glucagon remained significantly lower in patients (p=0.041) but not P-glucagon. Patients reported significantly more expressed interpersonal violence compared to healthy volunteers (Z= -2.83, p = 0.0047). Expressed violence was significantly positively correlated with insulin in P (ρ=0.46, p<0.05) and CSF (ρ=0.50, p<0.05) and showed a negative correlation with glucagon in P (ρ= -0.39, p<0.05) in study participants. Depression severity in patients was significantly negatively correlated with P-glucagon (ρ = -0.44, p= 0.034).
In the present study, patients after suicide attempt had centrally and peripherally increased levels of insulin and decreased levels of glucagon which were associated with a lifetime

history of expressed violence. These findings confirm and extend prior reports that higher insulin and lower glucagon levels in plasma and cerebrospinal fluid are associated with suicidal behavior pointing towards a potential autonomic dysregulation in the control of insulin and glucagon secretion in suicidal patients. Functionally, this endocrine pattern is consistent with a dysregulation of glucose homeostasis with increased tendency for hypoglycemia which may be linked to aggression.

20.3 AVOIDANT COPING STRATEGIES, BDNF AND THE HPA –AXIS IN SUICIDAL BEHAVIOR

Åsa Westrin*[1], Charlotta Sunnqvist[2], Rolf Ekman[3], Lil Träskman-Bendz[4], Daniel Lindqvist[4], Petra Suchankova[3], Agneta Ekman[3], Livia Ambrus[4]

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A person's inability to handle stressful events may result in suicidal behavior. Depending on the situation, this may be caused or worsened by current psychiatric state, personality traits and coping strategies. Of these, avoidant coping strategies seems to be a factor of special interest. Our group have previously reported an increased use of avoidant coping strategies in recent suicide attempters. We have also noticed a significant positive correlation between avoidant coping and current suicidal thoughts in recent suicide attempters, in suicide attempters at twelve year follow up and in patients with ongoing depression and no history of suicide attempts (unpublished data). An increased use of avoidant coping strategies has also repeatedly been linked to suicidal ideation by others in non-psychiatric and psychiatric populations. Interestingly, we recently noted an association between avoidant coping strategies and solidity, a personal trait reflecting impulsiveness (unpublished data). This indicates that a person who are more prone to use avoidant coping strategies may be more impulsive during a stressful situation. This could in turn increase the suicide risk.
It is also of relevance to explore the association between biological vulnerability and avoidant coping strategies. Such studies may lead to increased understanding of suicidal behavior and treatment strategies. Avoidant coping strategies may be trait related and may therefore possibly be inherited. However, avoidant coping strategies may also be enhanced during state of depression and experiences of long lasting or unbearable stress. One biomarker of interest to examine in relation to suicidal behavior, impulsiveness and avoidant coping strategies is brain-derived neurotrophic factor (BDNF). BNDF have a significant role in the differentiation, survival and maintenance of brain neurons. Previous studies of suicide victims have suggested that the gene expression of BDNF is downregulated in brain areas associated with emotion and cognition. It is also known that psychiatric patients with suicide attempts seem to have lower peripheral BDNF levels compared to those without such an attempt or healthy controls. We thus examined the BDNF Val66Met in 95 Swedish suicide attempters from two samples. According to our results the BDNF Val66Met gene polymorphism appears to have an effect on avoidant coping strategies as we found an association between the Met allele and an increased use of avoidant focused coping strategies after controlling for age and severity of depressive symptoms. In another study on 61 recent suicide attempters we noticed a positive and significant correlation between plasma BDNF and solidity but not between plasma BDNF and clinical symptoms, indicating that lower BDNF concentrations are associated with personality traits reflecting higher levels of impulsiveness and changeability. In a third study we reported a significant and inverse correlation between BDNF and post-DST cortisol in female suicide attempters but not in

male suicide attempters. This finding suggest that HPA-axis hyperactivity may be related to lower BDNF function in suicidal patients, and that these interactions may be related to sex. A general conclusion from these three studies is that that there seem to be a connection between vulnerability to stress, related to suicidal behavior and BDNF. We suggest that future studies should examine the influence of BNDF on brain function and the effect of psychotherapy in patients at risk to commit suicide.

20.4 EPIGENETIC AND TRANSCRIPTIONAL CHANGES IN THE CRH GENE ARE RELATED TO SEVERITY OF SUICIDE ATTEMPT AND A GENERAL PSYCHIATRIC RISK SCORE IN ADOLESCENTS

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In this study, comprising 88 suicide attempters, we aimed to identify HPA-axis coupled CpG-sites, in which modifications of the epigenetic profile are associated with severity of suicide attempt. Candidate methylation loci were further investigated and confirmed as risk loci for a general psychiatric risk score in the PSY-cohort.
Methods: The genome-wide methylation pattern was measured in whole blood using the Illumina Infinium Methylation EPIC BeadChip, measuring the methylation state of over 850 K CpG sites. Prior to analysis, the global DNA methylation pattern was pre-processed according to standard protocols and adjusted for white blood cell type heterogeneity. We included CpG sites located within 2000 bp of the transcriptional start site of the following HPA-axis coupled genes: Corticotropin releasing hormone (CRH), corticotropin releasing hormone binding protein (CRHBP), corticotropin releasing hormone receptor 1 (CRHR1), corticotropin releasing hormone receptor 2 (CRHR2), FKBP5 and the glucocorticoid receptor (NR3C1). We performed multiple linear regression models of methylation M-values to a categorical variable of suicide attempt severity, adjusting for gender, past or current alcohol abuse and occurrence of any non-borderline personality disorder. Next, we further investigated candidate CpG loci in a separate (PSY) cohort to see if these were differentially methylated to a general psychiatric risk score. Methylation levels of candidate CpG sites were further correlated with expression levels of the associated gene in an independent cohort of 11 healthy volunteers. Using the recently developed Blood Brain DNA Methylation Comparison Tool (http://epigenetics.iop.kcl.ac.uk/bloodbrain/), we were able to investigate the correlation coefficients between DNA methylation levels in whole blood and four brain regions. The methylation levels between blood and four different brain regions, i.e. prefrontal cortex (PFC), entorhinal cortex (EC), superior temporal gyrus (STG) and cerebellum (CER), were compared applying linear regression models with age and sex as confounders. Pearson's correlations having p-values<.05 were considered statistically significant.
Results: The suicide cohort comprising 88 suicide attempters was stratified into two groups (high or low risk). Inclusion criteria for the high-risk group included a violent suicide attempt, a later completed suicide or a high score (>6) on the Freeman scale. The methylation state of two CRH associated CpG sites were significantly hypomethylated in the high-risk group after corrections were made for multiple testing (cg19035496 and cg23409074)($p<0.001$). The PSY validation cohort consisted of 129 subjects stratified by in silico generated DAWBA measurements of a general psychiatric risk score into high risk (>~15%) or controls. In a cohort validation analysis, cg19035496 ($p<0.05$) was confirmed to

be hypomethylated in subjects with a high general psychiatric risk score by independent samples t-tests while cg23409074 (p=0.064) exhibited a non-significant hypomethylation tendency. Methylation levels of cg23409074 were further positively correlated with gene expression of the CRH gene in an independent cohort of 11 healthy male subjects. The methylation levels at both cg23409074 and cg19035496 were significantly correlated between blood and four different brain regions.
Conclusion: Our results show epigenetic and transcriptional changes in the CRH gene related to severity of suicide attempt and a general psychiatric risk score in adolescents. Significant blood-brain correlations in methylation further suggest these alterations impact on the expressional profile of CRH in brain.

21. MOBILE TECHNOLOGY, STATISTICAL LEARNING TECHNIQUES AND THEORY-BASED PREDICTIONS: RECENT ADVANCES IN IMPROVING OUR UNDERSTANDING OF SUICIDAL IDEATION AND BEHAVIOR

Chair: Thomas Forkmann, University Hospital of RWTH Aachen University

Overall Abstract: Suicidal ideation is one of the major predictors for the development of suicidal behavior. Thus, it is important to deepen our understanding of how suicidal ideation develops and which factors predict its course in order to improve prevention and treatment of both suicidal ideation and behavior. Following this aim, two things will help: (1) research testing major predictions of current theoretical models on the development of suicidal ideation such as the Interpersonal Theory of Suicidal Behavior (ITSV) or the Integrated Motivational-Volitional Model of Suicidal Behavior (IMV); (2) applications of modern methodological approaches for the collection and analysis of longitudinal data, such as ecological momentary assessments (EMA) and multilevel modelling. The presentations in this symposium will try to contribute to both aspects by presenting recent research results. The first talk presents results of a study applying EMA in order to answer the question whether or how suicidal ideation fluctuates across time and whether this fluctuation can be predicted by two of the central constructs of the ITSV, perceived burdensomeness and thwarted belongingness. The second talk focusses on the third central variable of the ITSV, acquired capability of suicide. Although this construct has been conceptualized as developing slowly across time and thus being relatively stable, research is missing that investigates this assumption empirically. Therefore, the talk presents results of a study using EMA in order to investigate whether acquired capability fluctuates within days and how a fluctuation – if it occurs – could be predicted. The third talk reports results of a series of studies that examines central pathways of the IMV-model, focusing on the constructs defeat and entrapment. It will show that (a) the effect of ruminative thinking on suicidal ideation is mediated by entrapment, (b) alterations of perceived burdensomeness and thwarted belongingness do not moderate the prediction of suicide ideation by means of feelings of entrapment, and (c) that ruminative thinking does not moderate the relation between defeat and entrapment. The fourth talk introduces possibilities to use statistical learning techniques to improve our understanding of suicidal behavior. Several different techniques will be presented: It will be shown that the application of item response theory and curtailment techniques may reduce the lengths of self-report instruments dramatically without affecting its psychometric quality. Next, the concept of graph theory and causality will be introduced. These techniques can help us understand causal mechanisms by only using observational data.
Implications of all results for research and clinical practice will be discussed.

21.1 PREDICTING THE OCCURRENCE OF SUICIDAL IDEATION BY MOMENTARY RATINGS OF BURDENSOMENESS AND BELONGINGNESS: AN EXPERIENCE SAMPLING STUDY IN PSYCHIATRIC INPATIENTS WITH UNIPOLAR DEPRESSION

Heide Glaesmer*[1], Thomas Forkmann[2], Dajana Rath[2], Ulrich Hegerl[3], Anette Kersting[3], Lena Spangenberg[1]

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Purpose: To date, empirical evidence on proximal factors predicting suicidality is scarce. One theory that sheds light on this issue is the Interpersonal Theory of Suicide (IPTS, Joiner, 2005). The IPTS hypothesizes two interpersonal cognitive-affective states that are dynamic: perceived burdensomeness (PB) and thwarted belongingness (TB). The simultaneous presence of these constructs is assumed to cause active suicidal desire. This experience sampling study investigates whether PB and TB are positively associated with suicidal ideation (SI) at the same time and whether PB and TB are able to predict the occurrence of SI prospectively (controlling for well-known risk factors for SI as depression and hopelessness).
Methods: 50 inpatients with unipolar depression reported on their momentary PB, TB, depressiveness, hopelessness, and SI ten times per day for six days via experience sampling method. Hierarchical linear modelling (HLM) was used to analyze associations between suicidal ideation and PB, TB, depressiveness, and hopelessness cross-sectionally and longitudinally.
Results: Multilevel analyses revealed that PB (B=0.155, SE B=0.040, p>.001), TB (B=0.082, SE B=0.033, p >.05), depressiveness (B=0.130, SE B=0.032, p>.001) and hopelessness (B=0.695, SE B=0.067, p>.001) are significantly and positively associated with SI cross-sectionally. In longitudinal analyses, only PB at ta (B=0.120, SE B=0.051, p >.05) turned out to be a significant predictor for suicidal ideation at ta+1 (even when controlling for suicidal ideation at ta).
Discussion: This is the first study with a longitudinal real-time assessment of PB and TB to predict SI. According the assumption of the IPTS, SI is associated with PB and TB cross-sectionally. In contrast, only PB is a significant predictor for SI in the longitudinal analysis. The findings are in line with a recent comprehensive review of Ma et al., 2016 which indicates mixed evidence for TB in cross-sectional studies, but it contributes evidence from a longitudinal study.

21.2 STABILITY AND COURSE OF ACQUIRED CAPABILITY OVER TIME: AN EXPERIENCE SAMPLING STUDY IN PSYCHIATRIC INPATIENTS WITH UNIPOLAR DEPRESSION

Lena Spangenberg*[1], Nina Hallensleben[2], Thomas Forkmann[3], Dajana Rath[3], Ulrich Hegerl[4], Anette Kersting[4], Heide Glaesmer[2]

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Purpose: In order to identify persons at risk for suicide and develop prevention strategies, theoretical approaches explaining the development of suicidal behaviors are of great importance. The Interpersonal Theory of Suicide (IPTS) (Joiner, 2005; van Orden et al., 2010) describes three interacting constructs leading to suicidal behaviors. The IPTS assumes

that desire for suicide evolving from the simultaneous presence of thwarted belongingness and perceived burdensomeness is not sufficient to die by suicide. To engage in suicidal behaviors (e.g. attempt suicide) that are painful and frightening, individuals must possess the capability to do so (acquired capability for suicide, AC). AC consists of two components: increased pain tolerance and fearlessness about death and is assumed to be a stable characteristic. So far, the stability of AC has not been studied empirically and the present study aims at filling this gap.

Methods: 50 inpatients with unipolar depression reported on their momentary AC and on their self-rated capability for suicide once a day for six days via experience sampling method (ESM). Intra-class correlations (ICCs) and mean square of successive differences (MSSDs) were calculated. 1-ICC reflects the amount of variability that can be attributed to within-person variability (i.e. assessment time). MSSDs indicate the average variability in a measure over time. Additionally, AC was assessed before and after the ESM part by the German Capability for Suicide Questionnaire (GCSQ, Wachtel et al. 2014) and test-retest reliability was analyzed.

Results: According to mean MSSDs, AC scales fluctuated considerably (mean MSSD = 1.1 for pain tolerance, 2.0 for fearlessness about death, 1.2 for capability for suicide). 1-ICC was .41 for pain tolerance, .54 for fearlessness about death and .34 for self-rated capability for suicide. Test-retest-correlations for the GCSQ-scales were r = .74 (pain tolerance) and r = .81 (fearlessness about death)

Discussion: Our ESM study provides first evidence that AC shows some variability over time. Yet, pain tolerance and self-rated capability for suicide appear to be more stable than fearlessness about death. These findings are not fully in line with the assumptions made by the IPTS, but might also reflect difficulties in operationalizing AC. Future studies should further investigate the stability and operationalization of AC.

21.3 STATISTICAL LEARNING METHODS TO HELP UNDERSTAND SUICIDAL BEHAVIOR

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Authors of a recent meta-analysis of 50 years of epidemiological research stated that classical studies and analysis will not result in better prediction of suicidal behavior, but statistical learning will (Franklin et others. 2016). Statistical learning refers to different techniques used for modelling and understanding complex datasets. Its popularity and applicability has increased with the rise of big data and better software. It contains many methods such as regression, LASSO, classification and graph analysis. These kinds of analysis have not been applied largely in the field of suicidality. In this presentation, different applications of statistical learning techniques will be demonstrated on actual data of suicidal patients. For example, Item Response Theory and curtailment techniques were used to examine response patterns of suicidal patients in order to find the most discriminating items of the Beck Scale for Suicide Ideation. Graph analysis was applied to build a network of 19 different suicidal symptoms, and to estimate the relationship between networkstructure at baseline, and suicidal behavior at follow up. To detect the different latent constructs within highly correlated items, such as items on defeat and entrapment, walktrap algorithms were more helpful when compared to standard factor analysis techniques such as Principal Component analysis. Finally, causal inference techniques can be used to estimate causal effects from observational data only. The benefits and pitfalls of these novel analytic methods will be discussed.

21.4 THE ROLE OF DEFEAT AND ENTRAPMENT IN PREDICTING SUICIDE IDEATION WITHIN THE INTEGRATED MOTIVATIONAL-VOLITIONAL MODEL OF SUICIDE

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Background: Within O'Connor's Integrated Motivational-Volitional Model of Suicide (IMV), feelings of defeat and entrapment are important predictors of the development of suicide ideation (SI). The model posits that defeat may lead to entrapment and entrapment to SI. However, the model proposes a range of moderating and mediating factors influencing these relationships. The impact of defeat on entrapment should be larger if people engage in ruminative thinking and ruminative thinking should exhibit no direct effect on SI but only through its influence on feelings of entrapment. Feelings of entrapment itself should lead to greater SI if people experience feelings of thwarted belongingness and perceived burdensomeness. Although some recent studies suggest the overall validity of the IMV-model and its central assumptions, empirical investigations testing these proposed relationships are missing. Results of three studies will be presented.
Methods: In study 1, N=226 (56.6% female; Mage=36.4, SDage=12.9, Range: 18-73) patients in an outpatient psychotherapeutic clinic and N=142 (75.4% female; Mage=35.2, SDage=14.8, Range: 17-71 years) participants of an online investigation participated. Studies 2 and 3 analyzed data from N=480 (74% female; Mage=28.5, SDage=11.1, Range: 18-80 years) participants of another online investigation. Self-report questionnaires on defeat, entrapment, depression, anxiety and stress, rumination, and suicide ideation were administered. In study 1, ordinary least square regression-based path analyzes were applied to estimate the direct indirect and total effects of rumination (predictor) and entrapment (mediator) on SI (criterion) for the online and the outpatient sample separately. To support causal interpretation of the results, the reversed mediation model with entrapment as independent variable and rumination as mediator was calculated. In studies 2 and 3, hierarchical linear regression analyses were performed with interaction terms of the predictor and the moderator entered in the last steps. Analyzes were conducted using SPSS (IBM, 2011) with the PROCESS macro 2.041 and R 3.3.2.
Results: In study 1, we found that perceptions of entrapment fully mediated the association between ruminative thinking and suicide ideation while the reverse relationship, where the association between entrapment and suicide ideation is mediated by ruminative thinking, was not supported. Study 2 showed that entrapment and perceived burdensomeness, but not thwarted belongingness, predicted suicide ideation. However, neither perceived burdensomeness nor thwarted belongingness moderated the association between entrapment and suicide ideation. Furthermore, as study 3 showed, both defeat and rumination predicted feelings of entrapment but rumination was not a moderator of the relation between defeat and entrapment.
Discussion: The presented results demonstrate that – in accordance with the assumptions of the IMV-model – the central variables included in the motivational phase of the model are significant predictors of suicide ideation. However, our results do not support the assumption that ruminative thinking moderate the relation between defeat and entrapment and that perceived burdensomeness and thwarted belongingness moderate the relation between

entrapment and suicide ideation. Future prospective studies replicating these results are needed before conclusions with respect to the assumptions of the IMV-model can be drawn.

22. IMPACT OF SUICIDE ON OTHERS

Chair: Madelyn Gould, Columbia University & New York State Psychiatric Institute

Overall Abstract: This symposium will explore the varied effects that a suicide can have on others. The first presentation, by Dr. Julie Cerel, will present the Continuum of Survivorship, which describes a theoretical terminology to describe different levels of effects of a suicide on those left behind. This will serve as an overarching model for the symposium. Dr. Cerel will then present data from the 2016 General Social Survey on the prevalence and correlates of lifetime suicide exposure and bereavement among a representative sample of American adults. The second presentation, by Dr. James Bolton, will review population-based administrative data studies examining suicide bereavement. Consequences to be presented include mental disorders, physical disorders, self-harm, mortality and social factors among different survivor relationships. The effects of suicide bereavement will be compared to the impact of other causes of sudden death. The third presentation, by Dr. Madelyn Gould, will examine the extent to which attitudes about coping strategies and help-seeking behavior are associated with high school students' exposure to a peer's suicide, and whether these relationships are modified by degree of friendship with the deceased and recent prior stressful life event. The need to tailor school-based postvention programs to target these attitudes will be discussed. The last presentation, by Katherine Shear, will focus on complicated grief (CG). Validated diagnostic criteria for CG and the results from a suicide-bereaved randomized controlled trial will be presented. Overall, the symposium aims to provide an empirical basis upon which to develop postvention programs tailored to the specific circumstances of the diverse population of exposed individuals in order to better meet their clinical needs.

22.1 EXPOSURE TO SUICIDE IN THE POPULATION

Julie Cerel*[1], William Feigleman[2]

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Background: There has been limited research to characterize those left behind after suicide, often termed "survivors" or "suicide loss survivors." There is now a growing body of research on how many people are left behind and what kind of physical and clinical sequela are associated with suicide loss across the population. The Continuum of Survivorship (2014) described theoretical terminology for designating different levels of impact on those left behind by suicide. This ranges from those exposed to suicide through those who are affected by it and finally to those who are bereaved by suicide, as a function of their loss of a close emotional attachment with deeply felt clinical consequences.
Objective: To examine prevalence and correlates of lifetime suicide exposure and bereavement utilizing a representative sample of American adults from the 2016 General Social Survey.
Methods: Questions on lifetime suicide exposures, bereavement and mental health status were administered to 1,432 respondents. Suicide exposed and bereaved respondents were compared to non-exposed respondents on measures of mental health functioning as well as on demographic characteristics.
Results: 52% of respondents had exposures to one suicide or more during their lifetimes, and 35% were deemed "bereaved by suicide", having experienced moderate to severe emotional

distress from their losses. Findings suggested more exposures and bereavements were associated with greater numbers of bad mental health days and more expectations of poor mental health. Most common relationships to the decedent in this sample included friend (40%), other relative (25%), acquaintance (17%) and first degree relative (8%). Those who reported suicide exposure were more likely than those who did not to be female, divorced, middle-aged, white, native born, live outside the nation's largest cities and have a gun in the home.
Conclusions: These findings suggest suicide exposures and bereavement are far more pervasive than commonly thought, with more than half of the population exposed and a third bereaved. Public Health Implications Health professionals need to more actively assess for suicide exposures and bereavements, helping to reduce the mental health distress presently associated with these experiences.

22.2 SUICIDE BEREAVEMENT: REVIEW OF POPULATION-BASED ADMINISTRATIVE DATA STUDIES

James Bolton*[1]

[1]University of Manitoba

Background: While bereavement is an almost universal experience, bereavement by suicide is often considered a distinct subtype with potentially worse consequences among surviving family members. Bereavement research has frequently been limited by selection bias and loss to follow-up. Administrative data using family linkages have many advantages that address these challenges and also can provide estimates on the impact of suicide bereavement in the general population. The objective of this presentation was to review population-based studies of suicide bereavement, specifically examining consequences among different survivor relationships, and comparing these to bereavement outcomes related to other causes of sudden death.
Methods: Selective review of population-based administrative data studies examining suicide bereavement. Outcomes of interest included mental disorders, physical disorders, self-harm, mortality, and social factors. Type of relationship examined included spouses, parents, children, and siblings.
Results: Studies consistently demonstrate the suicide death of a close relative as an experience associated with negative mental health and social consequences. Common outcomes across studies include increased rates of depression and anxiety disorders among surviving family members in the years following the death. Suicide-bereaved individuals consistently have an increased risk of suicide and self-harm, as well as all-cause mortality. These consequences appear to be consistent across the range of different relationships, with some effects noted in specific survivor groups. Offspring bereaved by parent suicide are at increased risk of hospitalization for drug disorders and psychosis, have a 2-fold increased risk of suicide, and have been shown to be more likely to engage in violent crime. Spousal bereavement is associated with a range of physical health consequences including sleep disorders, liver cirrhosis, and spinal disc herniation. Parents bereaved by offspring suicide are more likely than non-bereaved parents to separate or divorce. Whether bereaved by the death of a sibling or of a parent, the age of the child at time of loss influences mental disorder outcomes. Studies show contrasting results in outcomes when comparing individuals bereaved by suicide and other causes of sudden death. In one study, spouses bereaved by suicide showed up to 2-fold higher rates of mental disorders in the 5 years following the

death of their partner when compared to other bereaved spouses, but in another study this effect dissipated after accounting for higher rates of pre-bereavement psychiatric morbidity. A study comparing parents bereaved by offspring dying by suicide versus motor vehicle collision found no differences in rates of mental and physical disorders. Higher burden of mental disorder and social deprivation prior to the death suggest that bereavement is not a random event, possibly related to shared genetics or environmental effects.
Discussion: People bereaved by suicide are a group with increased burden of mental and physical disorder, self-harm, and mortality risk. Despite these consistent findings, the needs of bereaved family members tend to be poorly recognized and managed. Administrative data, despite its advantages, is limited in its assessment of the full range of possible bereavement effects. As such, additional population-based methodologies are required to examine outcomes such as complicated grief and quality of life.

22.3 EXPOSURE TO SUICIDE IN HIGH SCHOOLS: IMPACT ON ATTITUDES ABOUT COPING STRATEGIES AND HELP-SEEKING BEHAVIOR FOR SUICIDALITY

Madelyn Gould*[1], Marjorie Kleinman[2], Alison Lake[2]

[1]Columbia University & New York State Psychiatric Institute, [2]The New York State Psychiatric Institute at Columbia University Medical Center

Background: Adolescents' exposure to a peer's suicide is not uncommon and has been found to be associated with, as well as predict, suicidality (Insel and Gould, 2008; Swanson and Colman, 2013). There is some evidence that the sequelae of suicide exposure among schoolmates are modified by the degree of friendship with the decedent and prior stressful life events. Closest friends of a suicide victim appear not to be at heightened risk of suicidality compared with acquaintances, and students who have experienced stressful life events appear more affected by suicide exposure than those without such life events (Swanson and Coleman, 2013). Currently unknown is whether adolescents' attitudes about coping and help-seeking strategies are also impacted by their exposure to a schoolmate's suicide. The objective of this study is to determine the extent to which these attitudes are associated with students' exposure to a peer's suicide, and whether they are modified by degree of friendship with the deceased and recent prior stressful life events. The need to tailor school-based postvention programs to target these attitudes will be informed by our findings.
Methods: Students in twelve high schools in Suffolk and Westchester counties in New York State completed a two-stage assessment procedure between 1998 and 2001. At six of the schools ("exposed" schools), a student had died by suicide within the past six months; at the remaining six schools ("non-exposed" schools), no student death had occurred within that time. For the first stage of the assessment, a paper-and-pencil self-report survey including an 18-item suicide attitude assessment was completed by 1,969 and 2,419 students in four exposed and six non-exposed schools, respectively (Gould et al., 2004). An earlier factor analysis of this attitudes assessment identified two main factors -- maladaptive coping strategies (MCS) and help-seeking (HSS) strategies (Gould et al., 2004) -- which are the outcome measures in the present analyses. Within two days of the first survey, a computerized second stage assessment was completed by every student who screened positive for suicide risk on the first survey, and a randomly selected group of students who screened negative (approximately 10% at each school). The second assessment included

questions on the degree of friendship with the decedent (in the "exposed" schools), and a measure of recent stressful life events (in all schools).
Results: The mean score on the MCS scale was significantly lower among students in the exposed schools than in the non-exposed schools (t=4.98, df=4257 p<.0001). For example, the exposed students were significantly less likely to report that "people should be able to handle their own problems without outside help" (OR=0.70, 95%CI = 0.59-0.84, p<.001), "if you are depressed it is a good idea to keep these feeling to yourself" (OR=0.70, 95%CI = 0.55-0.90, p<.01), and in response to the question, 'what should you do if a friend tells you he/she is thinking about killing himself/herself?' be less likely to respond "I wouldn't take it seriously" (OR=0.70, 95%CI = 0.59-0.84, p<.001). The students in the exposed schools scored significantly higher on the HSS scale (t=-3.90, df=4386 p<.0001). For example, they would tell a suicidal friend "to talk to his or her parents" (OR=1.30, 95%CI = 1.15-1.48, p<.001). Potential effect modifications will also be presented.
Conclusions: It appears that the occurrence of a suicide in a high school enhances core beliefs that support the use of adaptive coping strategies in response to depression and suicidal thoughts and behaviors. Whether this effect is modified by degree of friendship with the deceased and recent stressful life events are to be determined.

22.4 COMPLICATED GRIEF TREATMENT

M. Katherine Shear*[1], Sidney Zisook[2], Naomi Simon[3], Charles Reynolds[4]

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Bereavement is one of life's most challenging stressors and suicide bereavement carries additional burdens. As such, it is a risk factor for the development of complicated grief (CG). CG occurs after the loss of any close relationship and with greater frequency after violent (e.g. suicide) death and after the loss of a child or spouse. This condition affects about 7-10% of bereaved adults worldwide with rates about 2-3 times greater after loss by suicide. CG consists of manifestations of persistent acute grief accompanied by complicating thoughts, feelings and behaviors. Typical grief complications include second-guessing, catastrophizing or self-blaming thoughts, behaviors aimed at escaping from the painful reality and/or avoiding reminders of the loss, and difficulty managing highly activated emotions. CG tends to be chronic and associated with a range of other negative health outcomes including very high rates of suicidal thinking and some evidence of elevated suicidal behavior. We devised and validated diagnostic criteria for CG and also developed and tested an adaptive grief therapy targeting complicated grief. This 16-session intervention focuses on facilitating adaptation to loss defined as accepting the finality and consequences of the loss, re-envisioning the future as having possibilities for happiness and re-establishing a meaningful sense of connection to the person who died. The treatment is based on the assumption that people have a natural capacity to adapt to loss if it is not impeded. We use 7 core modules to address the three processes entailed in adaptation and to identify and resolve complicating impediments. We conducted a study of 58 suicide bereaved individuals who participated in a randomized controlled study of complicated grief treatment. Suicide bereaved with complicated grief were very similar to individuals with CG bereaved by homicide/accident or natural causes however there are a few notable differences. This presentation provides an overview of recognition and treatment of CG and summarizes results of our suicide-bereaved randomized controlled trial.

23. SUICIDE GENETICS FROM POPULATIONS TO GENES: MULTI-LEVEL EXPLORATIONS USING THE UTAH POPULATION DATABASE

Chair: Hilary Coon, University of Utah School of Medicine
Co-Chair: David Brent, UPMC/ Western Psychiatric Institute & Clinic

Overall Abstract: The causes of suicide are heterogeneous, including environmental and genetic risk factors. We have an extraordinary opportunity to examine these risks using unique research resources at the University of Utah. We have now collected DNA from >4,500 suicide cases through a long-term partnership with the Utah Office of the Medical Examiner. We have linked records from these cases to the Utah Population Database, a database containing demographic, psychiatric, medical, and environmental data from over 8,000,000 individuals, in addition to unique genealogical records dating back to the founding pioneers of the area. In addition to our DNA cases, we have access to records for >18,000 suicides dating back to 1904.

These data have allowed us to pursue valuable studies in population epidemiology, including contributions of familial risk using the detailed genealogical records. This is the first US-based analysis to examine population-level familial suicide risk. Plans for our population work also include studies of how co-occurring demographics, psychiatric and medical conditions, and environmental exposures interact with familial risk using data available from the UPDB. Additional novel analyses will be described defining co-occurring underlying genetic risk through the computation of polygenic risk scores. These scores have been computed using existing results from very large genome-wide association studies of 35 different diagnoses and traits.

Another facet of our work with the data resource capitalizes on the record linking to the genealogies. This linkage has allowed us to identify over 400 very large pedigrees at high familial risk for suicide, each with at least 3 suicides with DNA. Pedigrees are from 6-9 generations, have from 4-60 suicide cases, and are from 2 to 20 times the expected risk using age/sex adjusted expectations for familial incidence. These families may represent more homogeneous subgroups of familial genetic risk shared from their common ancestors. In addition, because of the familial repetition of risk and genetic separation between cases, statistical power to detect genetic risk variants is greater than power for thousands of cases and controls.

We have developed a new, statistically powerful method, Shared Genomic Segments (SGS), for identifying significant familial variation in Utah high-risk pedigrees. This method accounts for intra-pedigree heterogeneity and multiple testing. SGS identifies genomic segments shared between distantly related cases using a dense genome-wide map of common single nucleotide polymorphisms. If the length of a shared segment is significantly longer than by chance, then inherited sharing is implied; theoretically, chance inherited sharing in distant relatives is extremely improbable. Chance sharing is assessed empirically using simulations accounting for linkage disequilibrium, and we derive pedigree-specific significance thresholds accounting for multiple testing.

We have several ongoing studies using this method in selected high-risk pedigrees that show unusual risk. One of these focuses on a high-risk pedigree with 21 suicide cases, about half of which are women. Because female suicide is approximately an order of magnitude rarer than male suicide, we have hypothesized that this pedigree may harbor more penetrant genetic risk factors. Analyses focus on regions with genome-wide statistical evidence containing genes

associated with both psychiatric and cardiovascular risk. The second study focuses on a high-risk pedigree with significantly increased incidence of personality disorders. In this analysis, genes in shared regions are compared to results of a detailed candidate gene study of PD in Utah suicide cases.

23.1 A POPULATION-WIDE ASSESSMENT OF THE FAMILIAL RISK OF SUICIDE IN UTAH, USA

Amanda Bakian*[1], Yue Zhang[1], Brandon Callor[2], Zhe Yu[1], Ken Smith[1], Heidi Hanson[1], Justin Berger[1], James VanDerslice[1], Anna Docherty[1], Sheila Crowell[1], Brooks Keeshin[1], Megan Puzia[1], Nancy William[1], Todd Darlington[1], Dale Cannon[1], Danli Chen[1], Hilary Coon[1]

[1]University of Utah, [2]Utah Office of the Medical Examiner

Suicide is the tenth leading cause of death in the U.S. and the seventh in Utah. Gene-environment interactions are strongly implicated in suicide. While suicide is expected to aggregate in families, there are few data resources available in the U.S. to assess familial clustering on a population basis. Our study's objectives were to 1) determine how the familial risk of suicide varied across different classes of relatives and, 2) examine differences in the familial risk of suicide based on suicide decedent characteristics in a total population-wide sample of Utah suicide decedents. The Utah Population Database (UPDB), a unique database containing genealogical, demographic and health data on 7.3 million current or previous Utah residents, was used to identify all suicides in Utah from 1904-2015 (N=19,440). Decedents who were younger than ten years of age at time of death as well as persons with no known relatives in UPDB were excluded. Risk set sampling without replacement was used to match each decedent to four living controls by gender and birth cohort. Relatives and spouses of suicide decedents were identified in UPDB including siblings, children, parents, grandparents, grandchildren, nieces/nephews, first and second cousins. Conditional logistic regression models were fit to estimate the relative recurrence risk (RRR) of suicide among suicide decedents versus controls for specific classes of relatives and spouses of decedents. Models were adjusted for sex and birth year of the decedent's relative or spouse. To examine potential effect modification, the logistic regression models were stratified by suicide decedent's gender and age (≤41 years of age versus >41 years of age). A total of 14,099 suicide decedents met our inclusion criteria and were matched to 56,396 controls. A statistically heightened RRR of suicide was measured for all relative classes (1st, 2nd, 3rd, and 5th degree relatives) as well as decedent spouses with the RRR of suicide showing a decreasing dose-response relationship with increasing degree of relatedness. Among first degree relatives, the RRR of suicide was 3.12 (95% confidence interval (CI): 2.68-3.64) among children, 2.94 (95% CI: 2.48 - 3.50) among parents, and 4.01 (95% CI: 3.57 - 4.50) among siblings. Among third and fifth degree relatives, the RRR of suicide was 1.29 (95% CI: 1.21-1.38) among first cousins and 1.09 (95% CI: 1.06 - 1.12) among second cousins. Among spouses, the RRR was 3.02 (95% CI: 2.22-4.10). The RRR of suicide varied by decedent's gender and age with, in general, the highest RRRs measured among relatives of female and younger decedents. For example, the RRR among children of mothers who died by suicide was 4.28 (95% CI: 3.17-5.79) while the RRR among children of fathers who died by suicide was 2.81 (95% CI: 2.35-3.36). The RRR of suicide among mothers of younger decedents was 2.7 times higher than the RRR of suicide among mothers of older decedents (AOR: 6.84; 95% CI: 4.34 - 10.79 vs AOR: 1.85; 95% CI: 1.01 - 3.42). Our study identified an increased familial risk of suicide across first through fifth degree relatives suggesting a role for shared genetic risk factors among Utah suicide decedents. The heightened relative

recurrence risk of suicide observed among decedent spouses indicates a role for shared environmental contributors and/or assortative mating. Within families, decedent sex and age appear to have differential effects on the recurrent risk of suicide with suicide by women and younger persons demonstrating an especially strong effect. As this is the first US-based population-wide assessment of suicide's aggregation in families, our study provides further evidence of the importance of incorporating family history into US-based suicide prevention strategies.

23.2 POLYGENIC PREDICTION OF THE PHENOME IN COMPLETED SUICIDE (N = 4,500)

Anna Docherty*[1], Arden Moscati[2], Amanda Bakian[1], Sheila Crowell[1], Todd Darlington[1], Gemma Wallace[1], Nancy William[1], Megan Puzia[1], Silviu Bacanu[2], Hilary Coon[1]

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Considering robust genetic influences on completed suicide, it is important to examine the molecular genetic overlap of completed suicide with putative medical and psychiatric risk factors. The large Utah Completed Suicide cohort (N = 4,500) and its associated high-risk extended pedigrees (N > 400) provide an opportunity to examine suicide completion in relation to polygenic risk scores (PRS) for all phenotypes in the genome-wide association study (GWAS) literature. Imputed genome-wide data in the Utah samples, available ICD codes, and publicly available summary statistics from 35 GWAS allow us to assess for associations of completed suicide and psychiatric diagnoses with polygenic risk for schizophrenia, major depression, bipolar disorder, cardiovascular disease, obesity, smoking, and 30 other mental and physical health phenotypes. We predict that in the Utah samples, decedents and their close relatives will have increased polygenic risk for 1) major psychopathology, 2) cardiovascular risk, and 3) inflammatory conditions, and that these risks will cluster within high-risk families. In the decedents, it is expected that higher PRS will correspond with both the presence of relevant psychiatric risk factors and to relevant ICD codes at time of death. Conversely, polygenic profile scores for extraversion and well-being are expected to be significantly lower in the suicide cases. The proposed study represents a translational research design to investigate etiology and improve molecular and phenotypic prediction of suicide risk, and to help prioritize unusual high-risk suicide families. An additional product of this study is a better overall understanding of the latent structure of suicide psychopathology. This project is consistent with NIMH efforts toward a refinement of continuous biological, behavioral, and personality traits to enhance prediction and prevention.

23.3 EXPLORING GENETIC RISK FOR SUICIDE IN A HIGH-RISK SUICIDE PEDIGREE WITH A SIGNIFICANT INCREASE OF FEMALE SUICIDES

Nancy William*[1], Todd Darlington[1], Elliott Ferris[1], Amanda Bakian[1], Brooks Keeshin[1], Brandon Callor[2], Leslie Jerominski[1], Megan Puzia[1], Sheila Crowell[1], Douglas Gray[1], Erik Christensen[2], Hilary Coon[1]

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Suicide is a major health issue, accounting for over 800,000 deaths per year globally and it is one of the top ten causes of death. The heritability estimate of completed suicide is 45%, suggesting a strong genetic aspect to suicide. Additionally, there are sex differences in relation to completed suicide; although the ratio of male to female completed suicide is almost 4:1, female suicide, being a rare event, suggest that the genetic liability in women may be higher. In fact, studies have shown that completed female suicides impart 74% greater suicide risk to offspring, and female suicidal behavior shows higher heritability. Therefore, we hypothesized that targeting gene discovery in high-risk pedigrees with significantly more women suicides than expected, we might increase our power to detect more penetrant genetic risk variants. We utilized the Utah Population Database (UPDB), a computerized genealogy database that includes genealogical, medical, and demographic data for over 8 million individuals, to identify and characterize a high-risk extended 7-generation family with a significantly increased rate of female suicide (10/21 cases=48% vs. 19.36% in the larger research cohort of ~4,500 cases, p=0.001). For our genetic analyses, we utilized a software

tool developed at the University of Utah called Shared Genomic Segments (SGS) to identify chromosomal regions significantly shared among eight suicide cases with DNA in this pedigree. Single nucleotide polymorphisms from the Illumina PsychArray genotyping chip were used to discover regions shared among these familial cases; these regions were hypothesized to genes that contribute to suicide risk in this pedigree. We identified 5 genome-wide suggestive regions on chromosomes 2, 4, 6, 7, and 15 and one region on chromosome 1 within the suggestive confidence interval, shared by 5 or more cases (genome-wide suggested p <3.59E-07; p<1.49E-07-2.32E-07 for chromosomes 2,4,6,7,15; p<4.41E-07, CI: 3.43E-07-5.39E-07 for chromosome 1). Gene analysis for these regions was performed using the software tool Genome Mining (GEMINI) to identify possibly interesting risk gene variants shared among cases when compared to internal and external control populations. Furthermore, we compared variants found in these regions to publicly-available GWAS results from very large psychiatric genetics studies, and performed haplotype analysis using PLINK for our regions. Our results indicate an enrichment for cardiovascular and psychiatric genes/pathways. In particular, we followed up variants in genes in our shared regions in the nitric oxide pathway, which overlaps both of these disease categories.

23.4 GENETIC ANALYSES OF UTAH SUICIDES WITH CO-OCCURRING PERSONALITY DISORDERS

Megan Puzia*[1], Sheila Crowell[1], Nancy William[1], Danli Chen[1], Leslie Jerominski[1], Brandon Callor[2], Todd Darlington[1], Douglas Gray[1], Hilary Coon[1]

[1]University of Utah, [2]Utah Office of the Medical Examiner

Suicide is a serious public health problem. There is compelling evidence that genes account for some of the observed variability in suicidal behavior; despite this, molecular analyses have yielded highly inconsistent findings. One reason for this is likely the heterogeneity of suicide phenotypes. The present study attempts to replicate previous genetic associations in the context of a more narrowly defined sample of suicide decedents with personality disorder (PD) diagnoses. Samples from Utah suicide decedents with a documented history of a personality disorder (PD) diagnosis were included in analyses. Subjects were genotyped using the Illumina HumanExome BeadChip platform (n=24) or the Infinium PsychArray-24 Beadchip microarray (n=90). The locations sequenced on both microarrays were cross-referenced with a list of 84 candidate genes that had previously been shown to be associated with suicidality and/or PDs. Chi-square analyses indicated that, compared to other Utah suicides the sample of PD decedents was younger, more likely to be female, and had higher rates of medical and psychiatric disorders. Genetic analyses revealed that variants on COL25A1, ESR1, DDC, ABCB1, GABBR2, ANO5, and COMT occurred more frequently than expected in the PD decedents. Of those, variants on ANO5 and DDC survived Bonferroni corrections for multiple tests. Previous research has linked variation on ANO5 with suicide. Previously, variation in DDC it has been found to be associated with antisocial and borderline PDs, but it has not been previously linked to suicide risk. DDC is known to catalyze the biosynthesis of neurotransmitters dopamine and serotonin, and in tryptamine, which acts as a non-selective serotonin receptor agonist. Additionally, COMT—which also contained significant variation in our sample— is also implicated in the dopaminergic synaptic pathway. More specifically, DDC and COMT, along with 34 other genes, contribute to the metabolism of tyrosine. We plan additional studies to assess variation in other genes affecting the tyrosine metabolic pathway in other suicide and/or PD samples. In a second parallel approach to find variants associated with a PD subset of suicide risk, we have also analyzed a Utah high-risk 8-generation family with 35 suicides. This pedigree has significant

familial risk for both suicide and PD. Using a novel analysis tool, Shared Genomic Segments, we identified genomic regions on chromosomes 1, 4, 6, 7, 10, 18, and 19 that are likely to have variants leading to risk of suicide and PD. We are using gene enrichment analyses to determine the intersection of gene pathways identified by these regions with our candidate gene analyses.

24. ZERO SUICIDE PRACTICE TO SCIENCE: BUILDING AN EVIDENCE BASE

Chair: Jane Pearson, National Institute of Mental Health

Overall Abstract: The Zero Suicide (ZS) initiative, led by the U.S. National Action Alliance for Suicide Prevention, is a commitment to preventing suicide attempts and deaths among individuals receiving treatment within health care systems. It seeks to improve health care systems' ability to identify who is at risk, and to implement effective treatments and services for at-risk individuals. To support ZS efforts, NIMH issued a request for applications (RFA) in November 2015, Applied Research Toward Zero Suicide Healthcare Systems. This symposium will describe the 'practice to science efforts' taking place in the US and internationally, and research progress to date (since September 2016 funding) in testing aspects of the ZS approach.

The first presentation will provide an overview of the "practice to science" progress that has been made in ZS internationally, providing examples from care systems that have adopted the principles and practices of ZS, and their successful outcomes. Drs. Mike Hogan and Richard McKeon (SAMHSA) will describe the feasibility and empirical questions policy leaders raise, including implementation challenges faced across settings. These challenges, in turn, will be discussed with regard to how additional research could address the challenges (e.g. adequate and efficient training of providers on a large scale, evaluating the impact of comprehensive approaches).

The second panelist, Dr. Barbara Stanley, will describe progress in her evaluation of New York State's effort to implement ZS in behavioral health care. In partnership with the New York State Office of Mental Health, the Columbia University researchers will compare risk assessment and safety planning quality improvements in suicide prevention practice across 145 outpatient state licensed clinics, which represent 85 New York state agencies, and include 1,490 clinical providers that reach over 80,000 adult clients. Findings from approximately 1,000 provider surveys will be presented at the meeting.

The third panelist, Dr. Joan Asarnow, will describe progress on the Step to Health (S2H) study, a randomized controlled trial evaluating a stepped care intervention, compared to ZS quality improvement initiated by a health system. Co-led by Dr. Greg Clarke, 300 youth (ages 12-24) will be enrolled at Kaiser Permanente Northwest (KPNW) and randomized to: KPNW's Zero Suicide practices; or these practices plus a stepped care treatment approach that matches treatment intensity, using treatments derived from recent research on treatments for youths with elevated risk for suicide/self-harm. The presentation will describe early implementation results.

The fourth panelist, Dr. Edwin Boudreaux, will describe the System of Safety (SOS) study taking place in the UMass Memorial Health Care system. Essential ZS performance elements--standardized suicide risk screening, safety planning with means reduction counseling, and facilitated care transitions--will be implemented using continuous quality improvement (CQI) strategies systemwide. The effort will span EDs, inpatient settings, and primary care settings and will improve care across all age ranges. Effectiveness will be

measured in terms of improved suicide-risk detection and decreased suicide-related acute healthcare events. The researchers will analyze the cost effectiveness of SOS. Early lessons learned facing the challenges of training busy clinicians within a CQI framework that entails iterative adjustment of protocols will be shared.
Audience questions and comments will be encouraged to clarify research gaps and practice efforts that need to be addressed, as ZS efforts continue to evolve.

24.1 ZERO SUICIDE PRACTICE: LESSONS FROM THE FIELD

Richard McKeon*[1], Michael Hogan[2]

[1]SAMHSA, [2]Hogan Health Solutions LLC

The Zero Suicide (ZS) initiative, led by the U.S. National Action Alliance for Suicide Prevention, is a commitment to preventing suicide attempts and deaths among individuals receiving treatment within health care systems. It seeks to improve health care systems' ability to identify who is at risk, and to implement effective treatments and services for at risk individuals, and most importantly, to reduce deaths by suicide among people receiving care. This presentation will provide an overview of the "practice to science" progress that has been made in ZS internationally, providing examples from care systems that have adopted the principles and practices of ZS, and their successful outcomes. The utilization of process and outcome measures, including the implications of tracking suicide mortality within a health care system, will be reviewed. The use of the term "Zero Suicide" has evoked both positive and negative responses from health care systems and suicide prevention advocates in the U.S. and internationally. Approaches and tools that can be used to address questions about unrealistic expectations, feasibility and other implementation challenges will be described. These challenges, in turn, will be discussed with regard to how additional research could address the challenges (e.g. adequate and efficient training of providers on a large scale, evaluating the impact of comprehensive approaches, identifying suicide risk in those not presenting with suicidal ideation or attempts.)

24.2 THE AIM MODEL FOR SUICIDE PREVENTION-ASSESS, INTERVENE AND MONITOR-(AIM-SP): IMPLEMENTATION FINDINGS IN OUTPATIENT CLINICS

Barbara Stanley*[1], Christa Labouliere[2], Gregory Brown[3], Molly Finnerty[4], Kelly Green[3], Anni Kramer[4], Prabu Vasan[4], Jay Carruthers[4], Milton Wainberg[2]

[1]College of Physicians & Surgeons, Columbia University, [2]Columbia University, [3]Perelman School of Medicine University of Pennsylvania, [4]NYS OMH

Despite development of evidenced-based practices, the number of suicide deaths has risen by nearly 50% over the past fifteen years.1 Behavioral health outpatients have a suicide rate nearly 100x higher than the general population,2 and ~45% of those who die by suicide in New York State receive care in outpatient behavioral health settings in the thirty days prior to their death.3 Clearly, evidenced-based practices have not sufficiently disseminated into outpatient care; however, where gaps in training and clinical practice lie has never been thoroughly examined outside of integrated care systems that are not truly representative of typical outpatient care. As such, the New York State Office of Mental Health and Columbia University have partnered together to conduct the largest implementation and evaluation of the Zero Suicide (ZS) model ever conducted, representing 145 outpatient state licensed clinics, which represent 85 New York state agencies, and include 1,490 clinical providers that

reach over 80,000 adult clients. Preliminary findings from approximately 1,000 provider surveys will be presented at the meeting.
Prior to statewide training and implementation of the Assess, Intervene, and Monitor for Suicide Prevention (AIM-SP) model of suicide-safer care, a Workforce Survey was administered to all clinical providers in participating clinics (N=1500+). This survey assessed baseline levels of suicide prevention knowledge and clinical practices, as well as important facilitators and barriers of suicide prevention best practices, including prior training, confidence/self-efficacy, attitudes toward suicide prevention, leadership support, infrastructure, and organizational climate. These data provide a well-defined snapshot of "treatment as usual" prior to implementation of suicide-safer care procedures, and suggest that the majority of clinicians do not typically receive the training or support needed to successfully or consistently apply suicide prevention best practices. Implications for improving suicide care and reducing suicide deaths in outpatient behavioral health will be discussed.

24.3 STEP TO HEALTH: A RANDOMIZED CONTROLLED TRIAL OF STEPPED CARE FOR SUICIDE PREVENTION IN ADOLESCENTS AND YOUNG ADULTS

Joan Asarnow*[1], Greg Clarke[2], Jeanne Miranda[3], Shelley Reetz[2], Kalina Babeva[3], Allison Firemark[2], Zhuochen Wang[3]

[1]David Geffen School of Medicine at UCLA, [2]Kaiser Permanente, [3]UCLA

This presentation describes the design, development, and early progress and results from the Step to Health (S2H) study. Consistent with the Zero Suicide (ZS) initiative's emphasis on improving care for suicide prevention within health care systems, S2H is a randomized controlled trial designed to evaluate an innovative stepped care suicide prevention intervention that matches intensity of treatment to severity of risk, compared to ZS quality improvement initiated by a health system. The study targets adolescents and young adults, an age group for whom an effective ZS strategy is critically needed because: 1) suicide is the second leading cause of death, accounting for more deaths than any medical illness; 2) suicidal tendencies and behaviors often first occur in this age span; 3) rates of suicide and suicide attempts (SAs) increase dramatically; and 4) effective intervention can reduce risk, suffering, and costs over lifetimes.
S2H combines a partnership with a health system, Kaiser-Permanente Northwest, that has strong infrastructure and commitment to quality improvement for ZS with a research team that has successfully implemented collaborative stepped care interventions in health systems and has expertise in clinical, health services, economics, and policy research and dissemination. A multi-stage screening process is used to identify and enroll 300 youths ages 12-24 with elevated suicide/suicide attempt risk. Beginning with identification of potential participants using a case finding algorithm within the Electronic Health Record (EHR), and after obtaining appropriate consents, a Stage 2 telephone screen followed by a final in person evaluation is used to determine study eligibility.
After completing baseline assessments, youths are randomized to either: 1) ZS quality improvement (ZSQI); or 2) ZSQI+ stepped care for suicide prevention, which integrates evidence-based suicide prevention with primary care and emergency services. Prior research demonstrates the value of similar integrated medical-behavioral health interventions for improving patient outcomes, rates of care, and continuity of care- a critical issue, as many youths discontinue care prematurely despite continuing risk. The ZSQI+ approach uses: 1)

risk assessments to triage youths to appropriate care levels; 2) Clinicians to deliver CBT and DBT skills training and support primary care and emergency clinicians with patient evaluation and treatment; 3) internet eCBT and therapeutic DBT skills video plus coaching support for lower risk youths, with in-person group and/or individual treatment added for higher risk youths; and 4) regular patient monitoring to facilitate clinical decision-making and the stepped care approach. The intervention period is 12 months, with outcomes assessed at 3, 6 and 12 month follow-ups. Compared ZSQI youths, youths randomized to ZSQI+ are predicted to have significantly lower rates of fatal and nonfatal SAs over time (primary outcome) and show improvements on secondary outcomes. Cost effectiveness analyses are planned. Results will provide critical information for health systems and science regarding the potential to achieve ZS goals by integrating state of the art science with practice quality improvement. The presentation will emphasize study design, early results of our multi-stage case-finding process, intervention design, and results from our Stakeholder Advisory Board meeting.

24.4 THE SYSTEM OF SAFETY (SOS)

Edwin Boudreaux*[1], Daniel Ambrus[1], Catarina Kiefe[1]

[1]University of Massachusetts Medical School

The System of Safety (SOS) study is taking place in the UMass Memorial Health Care system. Essential ZS performance elements--standardized suicide risk screening, safety planning with means reduction counseling, and facilitated care transitions--will be implemented using continuous quality improvement (CQI) strategies systemwide. The effort will span EDs, inpatient settings, and primary care settings and will improve care across all age ranges. Effectiveness will be measured in terms of improved suicide-risk detection and decreased suicide-related acute healthcare events. The researchers will analyze the cost effectiveness of SOS. Early lessons learned facing the challenges of training busy clinicians within a CQI framework that entails iterative adjustment of protocols will be shared.

25. SCREENING AND MANAGEMENT OF SUICIDE RISK IN PEDIATRIC MEDICAL SETTINGS: VALIDATING AND IMPLEMENTING THE ASK SUICIDE-SCREENING QUESTIONS (ASQ) WITH YOUNG MEDICAL PATIENTS

Chair: Lisa Horowitz, National Institute of Mental Health

Overall Abstract: How can we best leverage the medical setting to reduce the ever-climbing youth suicide rate? Recent studies show that the majority of youth who die by suicide have had contact with a healthcare provider within months prior to their death. Whereas medical visits afford an opportunity to identify, intervene upon and refer patients at risk for suicide, tragically, young people struggling with suicidal thoughts often present with somatic complaints and infrequently discuss their thoughts/plans unless asked directly.
As the youth suicide rate continues to rise, the American Academy of Pediatrics and the Joint Commission have recommended that all medical patients be screened for suicide risk in the emergency department (ED), medical inpatient units, and primary care offices- critical venues for identifying young patients at risk for suicide. The ED in particular may be the most important venue to capture youth at risk, given that ED clinicians are often the sole connection with the healthcare system for millions of individuals and are uniquely positioned to provide screening, brief intervention, and referral to treatment. Primary care clinicians have the advantage of a long-term relationship with many of their patients, enabling youth to

reveal hidden thoughts of suicide. The inpatient medical unit can identify and become a bridge to much needed psychiatric services for hospitalized medical patients.
Despite this national imperative for detecting suicide risk, evidence-based guidelines for screening and intervention programs are only beginning to be studied. Non-mental health clinicians on the frontlines require valid, population-specific and setting-specific instruments to accurately identify patients at risk for suicide. Implementing suicide risk screening is a general medical setting, often lacking in mental health resources, is a challenging endeavor. It effects multidisciplinary hospital staff at every level from senior hospital administrators to frontline clinicians. It is a change in practice for nursing, ED physicians who may not have familiarity or adequate training in managing mental health concerns in a medical setting. An even greater challenge is how to manage those patients that screen positive.
The goal of this session is to discuss research on suicide risk screening implementation and positive screen management programs across all medical settings, including the ED, the inpatient medical setting and the primary care setting. We will present two validation studies: 1) validation of the Ask Suicide-Screening Questions (ASQ) on the inpatient medical unit; and 2)validation of the ASQ in the outpatient primary care/specialty clinic settings; and 3) Implementation strategies, data and important learnings from three exemplary medical settings: 1)Parkland Hospital in Dallas, Texas, that has screened over 1 million patients for suicide risk, will present youth screening with the ASQ, and management of positive screens in the ED, inpatient and outpatient settings; 2)a large pediatric outpatient practice in Richmond, Virginia ;and 3)suicide risk screening implementation in the Boston Children's Hospital ED. Topics discussed will include: suicide risk screening, suicide risk clinical pathways, feasibility, nursing, and parent/patient opinions about screening across all settings, and future directions for implementation.

25.1 SCREENING FOR SUICIDE RISK WITH THE ASQ ON THE PEDIATRIC MEDICAL INPATIENT UNIT

Jeffrey Bridge*[1], Elizabeth Wharff[2], Daniel Powell[3], Martine Solages[4], Abigail Ross[5], Erina White[2], Sally Nelson[2], Elizabeth Lanzillo[3], Jarrod Smith[3], Maryland Pao[3], Lisa Horowitz[3]

[1]The Research Institute at Nationwide Children's Hospital, [2]Boston Children's Hospital, [3]National Institute of Mental Health, [4]Children's National Health System, [5]Fordham University

In February 2016, the U.S. national hospital accreditation board, the Joint Commission, issued a Sentinel Event Alert recommending suicide risk screening for all patients in the hospital setting. Previously in 2010, they had recommended screening for medical patients qualified with "at elevated risk;" however, given that a quarter of in-hospital suicides were occurring on non-behavioral health units, this recommendation was broadened to include universal suicide risk screening including the ED, the medical/surgical inpatient units and the outpatient primary care setting. Data reveal that medical patients are known to be at higher risk for suicidal ideation and behavior, positioning the pediatric medical/surgical inpatient unit as a valuable place to identify pediatric medical/surgical patients at-risk for suicide.
A major barrier to screening is the lack of brief, validated instruments available for non-psychiatric clinicians, who are on the frontlines of this severe public health threat. While the feasibility of screening youth for suicide risk has been studied in medical settings such as the ED and primary care clinics, it is unclear whether or not suicide screening tools used in these settings can be adapted to the medical inpatient unit. In September of 2013, an IRB-approved

multisite study was launched to test the use of the Ask Suicide-Screening Questions (ASQ), a brief, 4-item screening tool, on the pediatric medical inpatient unit.
The purpose of this presentation is to follow up on our previous IASR 2015 discussion of feasibility and now discuss the results of the ASQ validation study that occurred at three pediatric teaching hospitals in Boston, Massachusetts, Washington, DC and Columbus, Ohio. Data from 600 pediatric medical inpatients collected at these three urban teaching hospitals will be presented.
Results will highlight that routine screening on the inpatient medical/surgical unit can help identify at-risk patients and allow a bridge to much needed mental health resources. These validation psychometrics provide an evidence-based backdrop to the implementation data that will also be presented in this symposium. In addition, medically ill pediatric patients offered revealing comments describing, in their own words, the importance of prevention through proactive inquiry. These data lend further evidence to the importance of screening hospitalized youth for suicide risk in the medical setting.

25.2 VALIDATION OF THE ASK SUICIDE-SCREENING QUESTIONS IN PEDIATRIC PRIMARY CARE

Elizabeth Wharff*[1], Laika Aguinaldo[2], Abigail Ross[3], Shirley Li[1], Elizabeth Lanzillo[4], Lisa Horowitz[4]

[1]Boston Children's Hospital, [2]Boston Children's Hospital/Norfolk State University, [3]Fordham University, [4]National Institute of Mental Health

Background: Pediatric primary care patients are at increased risk for suicide. Ninety percent of youth with suicidal ideation, plan or intent were seen by a primary care provider within the previous year (McCarty et al., 2011). Early detection of suicide risk is a critical prevention strategy. Given the potential for screening to improve outcomes, primary care providers have enormous potential to prevent suicides and connect young patients with much needed mental health care. Screening can be effective, but is an under-utilized prevention strategy. Primary care providers often lack the training and capacity to implement suicide risk screening in their practices, due to discomfort, stigma, and lack of brief screening tools that have been validated in primary care. Validation of suicide risk screening tools and guidelines for implementation can be effective ways to identify patients at risk and to link them to specialty care. This study builds on previous research conducted with the Ask Suicide-Screening Questions (ASQ), a 4-item rapid suicide risk screening instrument that has been validated in emergency department settings, with adolescent and young adults. Given the 2016 Joint Commission Sentinel Event Alert, hospitals have been implanting the ASQ in inpatient and outpatient medical settings; however, validation data from the outpatient setting has not yet been presented. This presentation will describe the study designed to validate a suicide risk screening instrument in primary care.
Methods: This is a cross-sectional instrument validation study that took place at an urban, primary care clinic associated with a tertiary care teaching hospital. A convenience sample of 153 patients aged 10 to 21 years who presented to a primary care clinic attached to an urban academic hospital during data collection weeks were administered the ASQ and the criterion standard, Suicidal Ideation Questionnaire [SIQ] or Suicidal Ideation Questionnaire- Junior [SIQ-Jr.], a brief depression scale (the Patient Health Questionnaire- Modified for Adolescents [PHQ-A]), and a clinical and demographic questionnaire.

Results: A total of 151 patients were screened. 22 of the patients (14.5%) were at elevated suicide risk on the ASQ and 6 of the patients (3.9%) were at elevated suicide risk on the SIQ/SIQ- Jr. Fifty-three percent (N=80) of the sample was female, the average age was 16.85 (SD: 2.3) and the sample was diverse: 40.4% Latino, 32.4% Black, 14.6% White, 10% mixed, 2% Asian/Pacific Islander, and .6% Other. Data collection is projected to be completed in the next two months, and primary outcome measures will be reported; sensitivity, specificity, predictive values. Preliminary results show the ASQ with 100% sensitivity.
Conclusions: A 4-question screening instrument, the Ask Suicide-Screening Questions (ASQ), with high sensitivity and negative predictive value in medical patients, can identify the risk for suicide in youth presenting to primary care.

25.3 IMPLEMENTING SUICIDE RISK SCREENING IN PEDIATRIC MEDICAL SETTINGS: TURNING RESEARCH TOOLS INTO PRACTICE

Lisa Horowitz*[1], Elizabeth Wharff[2], Elizabeth Lanzillo[1], Sally Nelson[2], Fran Damian[2], Daniel Powell[1], Laika Aguinaldo[3], Ted Abernathy[4], Maryland Pao[1], Jeffrey Bridge[5]

[1]National Institute of Mental Health, [2]Boston Children's Hospital, [3]Boston Children's Hospital/Norfolk State University, [4]Pediatric and Adolescent Health Partners, [5]The Research Institute at Nationwide Children's Hospital

Since the U.S. accreditation board, The Joint Commission, issued a Sentinel Event Alert in February of 2016, U.S. hospitals have been challenged to implement suicide risk screening in medical patients. Many questions arise about best methods to implement screening such as what tools to use, who should be responsible for screening, how to train nurses and physicians on screening procedure, and most importantly, how to manage patients who screen positive for suicide risk without overburdening already strapped mental health resources and disrupting workflow.
Many hospitals begin with implementation in the emergency department, the natural point of entry for hospital inpatient stays, and then try to adapt these clinical pathways to include screening in outpatient clinics and inpatient units. However, utilizing the same clinical pathway in these different settings has pitfalls, especially when pediatric patients are involved. For example, it is not uncommon for healthcare providers to utilize adult instruments and adult clinical pathways for pediatric patients. This “one size fits all” approach presents challenges and generally is not effective when it pertains to suicide risk screening. Additional considerations are critical to address when screening pediatric patients for suicide risk in the hospital setting, such as training nurses to ask youth questions related to death. Nursing staff may be uncomfortable asking such questions, largely due to lack of experience discussing the topic or potential concerns about parent views and negative parental reactions. Engaging parents in this patient safety/public health initiative is not always easy, but it is crucial that these challenges are appropriately addressed to ensure consistent and effective screening of patients.
The goal of this presentation is to discuss real world adaptations of suicide risk screening and management of suicidal patients in two very different medical settings: the Boston Children’s Hospital ED and Pediatric and Adolescent Health Partners, a large pediatric outpatient practice in Richmond, Virginia. Turning research into practice, researchers assisted both sites as part of a quality improvement project and employed a Plan Do Study Act approach. Both sites implemented suicide risk screening with the Ask Suicide-Screening Questions (ASQ),

developed for pediatric ED medical patients and validated on the inpatient medical unit and in the outpatient primary care setting. Data collection is still ongoing and will be completed over the next two months. Positive screen rates to date are 7% in the ED and 12% in the pediatric outpatient practice. Using the data that has been collected, clinical pathways were derived, including a three-tier screening approach that includes 1) screening with the ASQ, 2) a brief suicide safety assessment for patients who screen positive to determine if a full psychiatric evaluation is needed, and 3) a full psychiatric evaluation or referral, if deemed necessary based on the brief suicide safety assessment.
Lessons learned from both these QI projects will be presented, including appropriate management of the patients that screen positive for suicide risk in both the ED and outpatient settings. The ASQ toolkit, which contains the ASQ suicide risk screener, guidelines for conducting the brief suicide safety assessment, scripts for nursing staff to introduce screening to patients, flyers for parents, and information designed to guide hospitals in the implementation of suicide risk will also be presented.

25.4 IMPLEMENTATION OF SUICIDE RISK SCREENING ON A GRAND SCALE: STRATEGIES FOR SUCCESS AND LESSONS LEARNED

Kimberly Roaten*[1]

[1]University of Texas Southwestern Medical Center

In late 2014 Parkland Health & Hospital System (PHHS) in Dallas, Texas committed to the development and implementation of a system-wide suicide risk screening program, an endeavor that exceeds The Joint Commission (TJC) requirements for assessing suicide risk as described in TJC Sentinel Event Alert #56, "Detecting and treating suicide ideation in all settings," published in February 2016. PHHS includes an 862 bed Level 1 trauma center inpatient hospital and 20 outpatient primary care clinics with more than 1 million outpatient visits and 250,000 emergency department visits annually.
The first step in the process of creating the screening program was engaging hospital stakeholders in dialogue about the importance of standardized screening and the potential benefits to the patients and the system. The primary concerns addressed included potential challenges with changes to work flow in a busy emergency department and managing high risk individuals in the outpatient setting. These discussions were the impetus for the creation of a standardized screening process using the electronic health record (EHR) in order to enhance patient-centered care and simultaneously maximize efficiency.
The design process began with selection of an instrument for screening pediatric patients across all settings in the system. The ASQ was chosen for screening patients between the ages of 12 to 17 based on the available validity data and the established feasibility of administration in hospital settings. The next challenge was constructing the ASQ in the EHR. A clinical decision support model was used to create a system in which nursing staff administers the screening items and records the responses which are then followed by the automatic generation of the appropriate clinical and safety interventions. Multiple safety processes were created to alert nursing and physician staff about identified risk and to assure that the appropriate actions are taken. Patients are stratified into one of three risk categories: no risk identified, moderate risk identified, and high risk identified. Each category is associated with the appropriate clinical interventions and documentation. Additional social workers were hired to manage the identified clinical needs. Education about the screening program was disseminated throughout the system and is ongoing. Program outcomes and

quality indicators are closely monitored through a series of ongoing reporting systems and EHR review.
The suicide risk screening program began in February 2015 and initiated suicide risk screening for all patients over the age of 12 during ED encounters, inpatient admissions, and outpatient primary care provider appointments. On average, 2,800 patients between the ages of 12 and 17 are screened per month in the outpatient primary care clinics for a total of over 34,000 completed screenings since the program was implemented. Additionally, more than 6,000 total pediatric patients have been screened in the ED, urgent care center, and inpatient units.
To date, more than 40,000 pediatric suicide risk screenings have been completed. At least one ASQ screening item was positively endorsed in approximately 2.5% of outpatient screenings and approximately 7% of hospital-based screenings. Additional data from the first two years of the PHHS program will be presented. This implementation program provides important information about the frequency of suicide risk identified through standardized in pediatric outpatient, emergency department, and urgent care settings. Additionally, the volume of the data produced by the program will allow researchers to begin exploring important clinical outcomes such as mortality and healthcare utilization.

26. SUICIDE IN OLDER ADULTS - FROM PREVENTION TO POSTVENTION

Chair: Yeates Conwell, University of Rochester School of Medicine

Overall Abstract: Worldwide, rates of completed suicide tend to be higher in later life than in younger age groups. Older adults are also the fastest growing segment of the population in most developing and industrialized countries. There is a pressing “demographic imperative”, therefore, to understand the factors that place older adults at risk for suicide, develop and implement preventive interventions, and mitigate the impact of suicide in this age group. This symposium is composed of four presentations that span the spectrum of prevention science from risk factor definition through treatment development to postvention.

Professor Liang Zhou will first present results of a case-control psychological autopsy study of older adults in rural China that compared older adults who took their own lives with an age, gender, and location matched sample of living village residents. Results highlight the importance of medical (impaired performance of activities of daily living), psychological (mental illness, depressive symptoms), and social factors (unstable marital status, separation from family, and low social support.)

The second and third presentations describe programs of interventions research designed to address these factors. Dr. Kimberly Van Orden and colleagues are testing a series of behavioral interventions that aim to modify suicide risk in later life by increasing social connectedness. Engage is a psychotherapy that encourages older adults to increase social engagement with the objective then of reducing suicide risk. Sixty-two older adult subjects were randomized to Engage or care as usual (CAU). The Senior Connection (TSC) study is a randomized controlled trial (RCT) in which 369 older adults who endorsed feeling lonely or like a burden on others were randomized to receive peer companion support or not. And the Getting Active Project (GAP), another recently implemented RCT, will establish the impact of volunteering as a peer companion on loneliness and suicide risk, rather than receiving support. Dr. Van Orden will report results of analyses of the Engage and TSC, and the design of GAP, and their implications for a focus specifically on social connectedness as a target for late life suicide prevention. Dr. Yeates Conwell and colleagues will describe two

interventions with a focus on late life depression that are being tested in RCTs in rural and urban Chinese primary care clinics. Both are based on chronic disease management precepts and integrated depression care management models shown effective in reducing suicidal ideation and depressive symptoms in Western countries. The Depression Care Management (DCM) study randomized 326 older adult, urban primary care clinic patients with clinically significant depression to receive collaborative depression care or care as usual, while the Chinese Older Adults Collaborations in Health (COACH) study has randomized 2365 depressed older adults with comorbid hypertension to the experimental intervention or CAU. COACH differs in that it is conducted in rural primary care clinics and includes a psychosocial treatment component. Results of both studies will be reviewed.

The final presentation, by Dr. Annette Erlangsen, recognizes that the impact of suicide in later life extends to surviving family members as well. Using Danish registry data, she reports on analyses to assess whether spousal bereavement by suicide among older adults was linked to excess risk of mental, physical, and social health outcomes when compared to older adults not exposed to spousal suicide.

26.1 INTEGRATED CARE MANAGEMENT OF LATE LIFE DEPRESSION IN CHINESE PRIMARY CARE CLINICS

Yeates Conwell*[1], Shulin Chen[2], Lydia Li[3], Hillary Bogner[4], Hengjin Dong[2], Wan Tang[5]

[1]University of Rochester School of Medicine, [2]Zhejiang University, [3]University of Michigan, [4]University of Pennsylvania, [5]Tulane University

Suicide rates in Chinese older adults are among the highest in the world. Late life depression is a potent risk factor for completed suicide in older adults, and efforts to optimize its detection and effective management are important components of any comprehensive suicide prevention strategy. However, mental health care is difficult to access in China. Primary care clinics are charged with chronic disease management in China, but primary care providers typically have little or no mental health training. We present here two stages in a program of research designed to increase capacity for primary care clinics in urban and rural China to manage depression in their older adult patients.

First, we report results of the Depression Care Management (DCM) study, a cluster randomized trial completed in urban Hangzhou primary care clinics that compared an integrated depression care management protocol with care as usual. DCM consisted of training primary care doctors in algorithm driven depression treatment with psychiatric consultation support. Over 12 months of participation 164 patients in eight DCM clinics had significantly greater reduction in depression symptom severity (Cohen's d = 0.8 [0.7-0.9]; p<.0001), response (OR = 4.3 [3.1-5.9]; p<.0001) and remission rates (OR = 12.7 [9.5-17]; p<.0001) than did 162 patients from eight matched clinics. As well, DCM subjects had significantly greater improvements in quality of life and reduced ratings of perceived stigma for depression care.

DCM was limited, however, by its sole focus on urban clinics and lack of a psychosocial intervention component to the model. Second, therefore, we describe the Chinese Older Adult Collaborations in Health (COACH) study – the subsequent phase in this program of research, which is ongoing with support from NIMH. Extending the findings of the DCM study, COACH tests integrated depression care management in rural Zhejiang Province primary care clinics among depressed older adults with comorbid hypertension (HTN) using a model similar to DCM. It is adapted, however, by the inclusion of an "Aging Worker" who helps the

team to address social dimensions of depression care. Older adult subjects were recruited from 103 village clinics assigned to the COACH intervention (n = 1232) and 116 villages assigned to deliver care as usual (n = 1133). They will be followed for one year. Additional survey and qualitative data have been collected from primary care doctors, aging workers, and village leaders as well to examine the acceptability of, and barriers to, implementation of the COACH model. We will report preliminary findings and future directions for anticipated dissemination of the model more broadly across Zhejiang Province.

26.2 OLDER ADULTS BEREAVED BY SPOUSAL SUICIDE: A NATIONWIDE STUDY

Annette Erlangsen*[1]

[1]Danish Research Institute for Suicide Prevention

Background: Bereavement by spousal suicide has been linked to mental disorders. Yet, it is unknown bereavement by suicide might affect people at older ages, which is the age segment with the highest suicide rate of all age groups. The objective of this study was to assess whether spousal bereavement by suicide among older adults was linked to excess risk of mental, physical, and social health outcomes when compared to older adults not exposed to spousal suicide.
Methods: All persons aged 65 years and older living in Denmark during 1980-2014 were followed in a nationwide cohort study design using register data. Older adults bereaved by spousal suicide were compared to peers who had not been bereaved by spousal suicide. Examined outcomes included: mental and physical disorders, social adverse events, and health care utilization, Incidence rate ratios were calculated using Poisson regressions while adjusting for socio-demographics and presence of mental and physical disorders.
Results: A total of 2,708,506 persons 65+ (1,271,427 men and 1,437,079 women) were observed. Among these, 3,137 older adults were bereaved by spousal suicide (915 men and 2,222 women). An elevate risk of being diagnosed with a mental disorder was noted among older adult men who had been bereaved by spousal suicide when compared to peers not bereaved by suicide (men: IRR [CI-95%]: 1.2 [1.1-1.4]; women: 1.0 [0.9-1.1]). Older adults bereaved by spousal suicide had higher risks of deliberate self-harm (men: 1.6 [1.1-2.3]; women: 1.5 [1.1-2.0]) and death by suicide (men: 3.7, [2.9-4. 7]; women: 3.9 [2.9-5.2]). However, those bereaved by suicide were not found to have a higher risk of dying by any cause (men: 1.0 [0.9-1.1]; women: 1.0 [<1.0-1.1]) when compared to peers. Women bereaved by suicide were more inclined to receive psychotherapy (men: 1.5 [<1.0-2.3]; women: 1.4 [1.1-1.8]) than peers not bereaved by spousal suicide.
Discussion: This is the first study to examine health-related and social outcomes of exposure to spousal suicide among older adults. The findings demonstrate that being bereaved by suicide in later life is a highly distressing event that affects mental health of the surviving spouse. Despite a higher usage of psychotherapy among older adult women who were bereaved, adverse effects remained; indicating that more support is needed for older adults who lost a loved one to suicide.

26.3 PREVENTING SUICIDE IN LATER LIFE BY PROMOTING SOCIAL CONNECTEDNESS

Kim Van Orden*[1], Yeates Conwell[1]

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Older adults who are socially isolated—defined as those with restricted social networks and/or loneliness—are at risk for numerous suicide risk factors, including reduced quality of life, physical illness, functional impairment, cognitive impairment, and depression. Social isolation is also associated with suicide ideation, attempts, and deaths in later life. Social isolation is both a risk factor for late-life suicide and a potential intervention target. Despite the negative consequences for health and well-being, little is known about how to reduce social isolation and increase social engagement. This presentation will describe three randomized trials of behavioral interventions, all designed to modify suicide risk in older adults by increasing social connectedness: the ENGAGE intervention, The Senior Connection (TSC), and the Getting Active Project (GAP). Engage is a psychotherapy that encourages older adults to increase social engagement. TSC tests an aging services program that provides peer companionship. GAP tests the effect of providing (rather than receiving) peer companionship as a means of reducing loneliness. Final results of TSC (n=369) indicated that peer companionship was associated with reduced depression, anxiety, and feeling like a burden on others after 12 months of the intervention. For ENGAGE, n=62 adults were randomized to ENGAGE or care-as-usual, with n=57 completing 10 week follow-up. Only two subjects did not complete a full course of ENGAGE, indicating high acceptability and feasibility of the intervention; outcomes analyses are underway. The rationale and design of GAP will be presented, as the study recently began data collection. These studies will be discussed in terms of what they tell us about what works to reduce social isolation and suicide risk in later life, and what is needed in terms of future research to address the public health problem of social isolation and suicide risk in later life.

26.4 RISK FACTORS OF COMPLETED SUICIDE AMONG CHINESE RURAL ELDERLY: A PAIRED CASE-CONTROL PSYCHOLOGICAL AUTOPSY STUDY

Liang Zhou*[1], Cunxian Jia[2], Zhenyu Ma[3], Guojun Wang[4]

[1]The affiliated brain hospital, Guangzhou Medical University, [2]Shandong University, [3]Guangxi Medical University, [4]Central South University

Objective: To describe the characteristics of suicides among rural residents older than 60 in China and to explore the risk factors using paired case-control study design and psychological autopsy method.
Method: Research sites included 12 counties in Shandong, Hunan and Guangxi provinces. All suicides older than 60 between June 2014 to Sep 2015 were recorded, and living comparisons matched in age, gender, and living locations were randomly selected. Two informants for each suicide case and living comparison were selected for face-to-face interview. Structured Clinical Interview for DSM-IV was used to generate diagnosis of mental illness; other measurements include Duke social support index, quality of life, activities of daily life, geriatric depression scale, stressful life events.
Result: 242 pairs of suicide cases and living comparisons aged 60-95 years old were recruited. 136 (56.2%) of them were male. Compared to living comparisons, suicides were more likely to have unstable marital status, to live alone, and to be left behind.
Most commonly used suicide method was pesticides (51.7%), followed by hanging (39.3%). 50.4% of suicides and 5% of living comparisons had at least one diagnosis of DSM-IV axis I mental illness. The most common diagnosis in suicides was mood disorders (42.1%), followed by schizophrenia and other psychotic disorders (6.2%) and alcohol dependence (5.8%). Conditioned multiple logistic regression showed that risk factors of suicide among

rural elderly in China included unstable marital status, mental illness, depressive symptoms, impaired daily activity function, low quality of life, and low social support.
Further data analysis is still going on, and new results may be presented in the conference.
Conclusion: Risk factors of suicide among rural elderly in China included unstable marital status, mental illness, depressive symptoms, impaired daily activity function, low quality of life, and low social support.

27. USING LARGE AND COMPLEX DATA IN SUICIDE RESEARCH

Chair: Vincent Silenzio, University of Rochester

Overall Abstract: As the 21st Century unfolds, it is clear that technology increasingly pervades every moment of human existence. A byproduct of this fact is that the ubiquity of technology has led to the creation of very large, highly complex data about people, both individually and collectively. The availability of these data, combined with corollary scientific advances and with the increases in computing power, has opened up previously undreamed of opportunities to conduct groundbreaking research. It also provides exciting opportunities to fundamentally expand our understanding of complex health phenomena, such as suicide, self harm, and mental health. In this symposium, we will address a range of examples of this Brave New World of research, and introduce the outlines of some of the innovative research directions that are appearing on the horizon. Examples will include research using data derived from sources as diverse as electronic health records, to online social media, to remote sensor technologies, to mobile devices such as smartphones. In addition, some of the novel intervention and resource delivery mechanisms created by these new technologies will be addressed. Finally, some of the urgent ethical challenges raised by data science research in this context will be discussed.

27.1 THE ALGORITHM WILL SEE YOU NOW: DATA SCIENCE IN SUICIDE AND MENTAL HEALTH RESEARCH

Vincent Silenzio*[1], Henry Kautz[1], Anis Zaman[1], Adam Sadilek[2], Christopher Homan[3], Eric Caine[1]

[1]University of Rochester, [2]Google, [3]Rochester Institute of Technology

Data about us is everywhere. It’s on our phones. It’s in our refrigerators. It’s in our cars. It’s in our medical records, our credit cards, our electric and other utility bills, our social media accounts, and on and on, seemingly ad infinitum. Many people think, naively, that this data can only be accessed or analyzed with great difficulty, and that it can only ‘discover’ things that are explicitly included in the data itself. And, since people rarely, if ever, openly discuss health topics online (or with their refrigerators), many assume that these cannot be useful for health research, especially in areas as potentially sensitive as mental health. However, our work over nearly a decade of collaboration, has shown that myriad sources of data can be used to not only explore complex health phenomena, such as mental health and suicide, but that highly 'unrelated' sources of data can be used to generate powerful predictive models. In this session, we will review the general approaches in machine learning and related methods as these have been applied in our work with data derived from sources such as social media and other forms of online expression. We also discuss our efforts to develop frameworks for data science research ethics applied to mental health research, both within the US and abroad, and how these frameworks have been directly informed by, and have directly informed, our group's research efforts. Finally, we present some of the current and future directions of data science in the service of suicide research, and some of the evolving challenges ahead.

27.2 LINKING PREDICTION AND PREVENTION IN LARGE HEALTHCARE SYSTEMS

Gregory Simon*[1]

[1]Kaiser Permanente Washington Health Research Institute

This presentation will review opportunities for suicide risk prediction and suicide prevention in large healthcare systems. Specific topics to be discussed will include:
- Data available from health system records
- Regulatory and ethical concerns regarding use of health system data
- Linking risk prediction to specific prevention activities
- Distinguishing risk prediction from estimation and hypothesis testing
- Distinguishing between-person variation and within-person variation in risk
- Embedding risk prediction and population-based prevention in electronic health records
- New data types available in health system records
- Linking health system records with other "real-life" data

27.3 DELIBERATE SELF-HARM AND FOLLOW-UP INTERVENTION: INSIGHTS FROM ROUTINE PRACTICE

Ping Qin*[1]

[1]National Centre for Suicide Research and Prevention, University of Oslo,

Deliberate self-harm is a frequent cause of presentation to emergency clinics and denotes a strong predictor for self-harm repetition, suicide and premature mortality. Appropriate follow-up care and intervention of the patients after self-harm treatment is of great importance in clinical management and could have a profound influence on the patient's life in both short- and long-term. Although clinical guidelines for treatment of patients with self-harm have been available in a number of countries, the evidence-base to guide this management is sparse. Search for effective follow-up care for deliberate self-harm in routine practice is in general hampered by the difficulties in determining the effectiveness in real world settings. Recent reviews have suggested that psychosocial consultation following self-harm treatment is of benefit in preventing repeat self-harm. There are also studies indicating a positive effect of referrals to specialist treatment and low-cost follow-up interventions to generate the feeling of connectedness in patients. To date, most studies on this topic are based on clinical samples and the findings may not be generalizable because of the limited amounts of participants and the variations of recruitment procedures. Large-scale population studies are clearly needed to gain firm and meaningful insight on how follow-up care and intervention influences the patients' health as well as social performance prospectively. This presentation will provide an update of findings from recent studies that used data collected in routine practice about the provision of follow-up care and intervention and their effectiveness for patients with deliberate self-harm.

27.4 MODELING SHORT-TERM CHANGES IN SUICIDAL IDEATION AND BEHAVIOR: THE CHALLENGES AND THE PROMISE IN THE ANALYSIS OF HIGH-FREQUENCY DATA

Hanga Galfalvy*[1]

[1]Columbia University

Advances in technology are rapidly transforming the way we communicate, learn and interact with our surrounding, and the tools and gadgets that are now mass-produced, and mass-consumed, are able to collect enormous amounts of data. Taken together with converging progress in statistics, artificial intelligence and data science, this expanding array of tools are already leading to unprecedented transformations in the way mental health is investigated, and the way care is delivered and evaluated. Ecological Momentary Assessment (EMA) is a method for collecting real-time, frequent data on people's thoughts, feelings and actions as they occur in their "natural" ecological setting: at work, at home, while running errands, etc. using the tool they are probably most familiar and comfortable with: their mobile phone. From the point of view of investigating the short-term risk of suicidal behavior, it holds enormous potential, since it can be used for collecting data on minor and major stressors as they occur, how they influence affect, suicidal ideation and behavior, what coping mechanisms were used and whether they were successful. It can be used to establish temporal precedence between changes is stress, affect, suicidal ideation and behavior, it reduces or eliminates recall bias, and can be used to quantify both between- and within-subject variability on a range of characteristics at the same time. However, the analysis of EMA data also presents some unique statistical challenges that investigators should consider, which complicate the analysis. These include accounting for within-subject correlation of measurements over time, unequally spaced observations and response bias in choosing when prompts are answered, striking the balance between accurately modeling multivariate relationships of changing longitudinal measures and the risk of over-fitting the data from the (usually moderate sized) sample, and, on a more basic level, the difficulties in establishing psychometric properties of psychiatric scales reduced to a handful of items measured at much higher frequency than they were probably designed for. In this presentation we will illustrate some of these challenges, and the promises, on a data set of N=83 patients with Borderline Personality Disorder at high risk of suicide attempt, assessed on 76 items up to 6 times a day over a one-week period. The aims of the study were: 1. to identify patterns of variability in suicidal ideation and affect, and their association with baseline factors; and 2. to test short-term predictors (life stress, coping strategies applied) of changes in suicidal ideation and self-harm behavior. We will show that the effects of life stress and coping behaviors are significant and selective, as they depend both on the type of stress, and the subjects' baseline characteristics. Furthermore, subjects display a wide range of variability in their suicidal ideation patterns. Together, these findings raise the question of whether these patients could or should be treated with the same interventions, despite their common primary diagnosis-and if not, how the EMA data collection could be paired with personalized, and scalable, intervention that exploits these individual differences.

References:

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28. NEW MODELS AND METHODS FOR PREDICTING SUICIDE RISK

Chair: Helen Christensen, Black Dog Institute

Overall Abstract: Predicting suicide risk with accuracy continues to be a major challenge, despite extensive research on risk factors. Computational and mathematical modelling,

natural language processing, and machine learning, alongside increasingly sophisticated human algorithms, have greatly expanded the capacity to identify and predict suicide risk. These novel techniques are able to obtain additional insight from various information sources that individuals produce. These information sources include social media, medical records, clinical notes, voice recordings, and mobile phone usage data. By "borrowing" the methodologies of other disciplines and using these new sources of information, the accuracy of prediction has been found to outperform some of the traditional suicide risk-scoring tools. This symposium includes presentations of four projects that have created new models of suicide prediction by applying different methodologies or using different types of data (or both). Computer Scientist, Founder and CEO of Qntfy, Dr Glen Coppersmith, will outline how natural language processing of social media data can be used to profile suicide risk. Dr Craig Bryan, Assistant Professor and Clinical Psychologist at the University of Utah, will outline new models for assessing suicide risk among US military personnel. Research Fellow Dr Bridianne O'Dea from the Black Dog Institute will outline her research which uses automated linguistic analysis to identify social media markers of suicide risk. Also from the Black Dog Institute, Dr Mark Larsen will present on a group of studies that investigate the feasibility and validity of using mobile phone data to monitor social connectivity and its viability as a suicide marker. This session will be Chaired by Professor Helen Christensen, Director of the Black Dog Institute, and Scientia Professor in Mental Health from the University of New South Wales, who will discuss the potentials for such modelling and applications to be implemented at scale and in real-time.

28.1 QUANTIFYING THE WHITESPACE

Glen Coppersmith*[1], Ryan Leary[1], Kate Loveys[1], Anthony Wood[1]

[1]Qntfy

Behavioral assessment and measurement today are typically human intensive (for both patient and clinician) processes. Moreover, by their nature, they focus on retrospective analysis by the patient (or the patient's loved ones) about emotionally charged situations – a process rife with biases. We examine all the data in the "white space" between interactions with the healthcare system (social media data, wearables, activities, nutrition, mood, etc.), and have shown quantified signals relevant to mental health that can be extracted from them. These methods to gather and analyze disparate data unobtrusively and in real time enable a range of new scientific questions, diagnostic capabilities, assessment of novel treatments, and quantified key performance measures for behavioral health. These techniques hold special promise for suicide risk, given the dearth of unbiased accounts of a person's behavior leading up to a suicide attempt. Here we will focus primarily on the computational analysis of social media data, and some of the signals of suicide risk that emerge from straightforward machine learning analysis.

28.2 PREDICTORS OF EMERGING SUICIDE DEATH AMONG MILITARY PERSONNEL ON SOCIAL MEDIA NETWORKS

Craig Bryan*[1], AnnaBelle Bryan[2], Jon Butner[3], Sungchoon Sinclair[3]

[1]National Center for Veterans Studies, [2]National Center for Veterans Studies & The University of Utah, [3]The University of Utah

Suicide is a leading cause of death in the United States and is the second leading cause of death in the U.S. military. Previous research suggests that data obtained from social media networks may provide important clues for identifying at-risk individuals. To test this

possibility, the social media profiles from 315 military personnel who died by suicide (n=157) or other causes (n=158) were coded for the presence of stressful life situations (i.e., triggers), somatic complaints or health issues (i.e., physical), maladaptive or avoidant coping strategies (i.e., behaviors), negative mood states (i.e., emotion), and/or negative cognitive appraisals (cognition). Content codes were subsequently analyzed using multilevel models from a dynamical systems perspective in order to identify temporal change processes characteristic of suicide death. Results identified temporal sequences unique to suicide, notably social media posts about triggers followed by more posts about cognitions, posts about cognitions followed by more posts about triggers, and posts about behaviors followed by fewer posts about cognitions. Results suggest that certain sequences in social media content may predict cause of death and provide an estimate of when a social media user is likely to die by suicide.

28.3 USING SOCIAL MEDIA DATA TO DETERMINE INDIVIDUALS' RISK OF SUICIDE

Bridianne O'Dea*[1], Mark Larsen[1], Thin Nguyen[2], Dinh Phung[2], Svetha Venkatesh[2], Helen Christensen[3]

[1]Black Dog Institute, University of New South Wales, [2]Centre for Pattern Recognition and Data Analytics, Deakin University, [3]Black Dog Institute

Suicide is a leading cause of death worldwide. Identifying those at risk and delivering timely interventions is challenging. Social media sites are used by individuals to share thoughts, feelings, and behaviour. It has been hypothesised that individuals' linguistic expression on social media may indicate the mental states that characterise suicidality. Automated linguistic analysis of social media content may help to differentiate those who require support or intervention from those who do not. This project aimed to determine the individual markers of linguistic expression (i.e. features, topics, and emotional sentiments) on social media that accurately represent an individual's risk of suicide. Individuals who blog were recruited into a 32 week study in which their mental health was assessed fortnightly online using validated clinical scales. Participants also consented to the extraction of their blog data. To determine individual markers, linguistic features from individuals' blogging data were extracted and correlated these with their mental health scores using Bayesian non-parametric methods. To date, 153 participants have been recruited (age range=18-67 years; 87% female). A total of 82% posted during the study period, with an average of one post per week. At the group level, mental health status had small correlations with linguistic features ($r = 0.1–0.2$); however, very strong correlations were found at the individual level. Unique linguistic features (e.g. negative emotion, mentions of money, use of numbers) were found to highly correlate with individuals' mental health, including suicidal risk ($r = 0.67$-0.96). This study indicates that we may able to identify when individuals are in a suicidal state based on intra-individual modelling of their blog data. Innovations include the novel method for detection; the application of Bayesian nonparametric methods for context-sensitive modelling; and the ability to identify using personalised predictive algorithms. By analysing the social media data that individuals generate naturally and effortlessly in the daily course of their lives, we can monitor individuals' mood to determine when support is required.

28.4 SMARTPHONE APP TO INVESTIGATE THE RELATIONSHIP BETWEEN SOCIAL CONNECTIVITY, DEPRESSION, AND SUICIDAL IDEATION

Mark Larsen*[1], Tjeerd Boonstra[1], Aliza Werner-Seidler[1], Bridianne O'Dea[1], Helen Christensen[1]

[1]Black Dog Institute, University of New South Wales

Interpersonal relationships are necessary for successful daily functioning and wellbeing. Numerous studies have demonstrated the importance of social connectivity for mental health, both through direct peer-to-peer influence and by the location of individuals within their social network. Social withdrawal is key risk factor for depression and suicide. Passive monitoring using smartphones provides an advanced tool to map social network, connectivity and withdrawal, based on the proximity between individuals. This presentation outlines an investigation into the feasibility of using a smartphone app to measure and assess the relationship between social network metrics and mental health for the purposes of reducing suicidality. The app was administered and collected Bluetooth and mental health data (including suicidal ideation) from 63 participants. Social networks of proximity were estimated from Bluetooth data and 95% of the edges were scanned every 30 minutes. Although the distribution of depression scores was skewed towards zero, thus making it difficult to interpret meaningful patterns, there was some degree of clustering of participants with moderate or severe depression scores. The majority of participants found this method of data collection acceptable and reported that they would be likely to participate in future studies using this app. These findings demonstrate the feasibility of using a smartphone app that participants can install on their own phone to investigate the relationship between social connectivity and mental health. This kind of objective information has the capacity to improve the detection of mental illness using objective social network indices, provide risk factors for suicidality by detecting social withdrawal, as well as potentially suggest novel avenues for intervention. If this method of passive data collection reported here can be replicated and scaled, it has the potential to represent a methodological paradigm shift in the field of mental health and social connectivity given the historical reliance on self-report methods that are subject to bias.

Oral Session Abstracts

Monday, November 6, 2017

NEUROCOGNITIVE PROCESSES & SUICIDALITY

Chair: Katalin Szanto, University of Pittsburgh

1. DOES NEUROCOGNITIVE FUNCTIONING DISTINGUISH SUICIDE ATTEMPTERS FROM SUICIDE IDEATORS? A SYSTEMATIC REVIEW

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[1]University of British Columbia

Background: Findings from a growing number of studies indicate that suicide attempters exhibit altered neurocognitive functioning on a range of neuropsychological measures. However, it remains unclear whether differences in neurocognitive functioning are associated with suicidal thoughts or suicidal acts, an important distinction given that most people who think about suicide do not act on their thoughts
Methods: A systematic review was conducted to examine differences in neurocognitive functioning in individuals with a history of suicide attempts (attempters) and individuals with a history of suicidal thoughts but no history of suicide attempts (ideators).
Results: A total of 12 studies were identified that compared attempters to ideators on at least one neurocognitive measure. Across the 12 studies, negligible median effect sizes (Hedges' $g<0.2$) were observed between attempters and ideators on measures of global cognitive functioning, intelligence, memory, attention and shifting; an executive functions subdomain. In contrast, small to medium effect size differences were observed on measures assessing overall executive functioning ($g=-0.29$) and executive functioning subdomains including inhibition ($g=-0.50$), updating ($g=0.40$), verbal fluency ($g=-0.21$), and processing speed ($g=0.24$).
Discussion: These results tentatively suggest that certain subdomains of executive functions might differentiate suicide attempters from suicide ideators and therefore may be important to consider in suicide risk assessments. However, the findings of this review are limited by several factors including the small number of studies examining neurocognitive differences between suicide attempters and suicide ideators, the use of different neurocognitive measures, as well as the demographic and clinical heterogeneity of the participant samples.

2. NEUROCOGNITIVE DEFICITS AS FAMILIAL RISK FACTORS FOR SUICIDAL BEHAVIOR

John Keilp*[1], Sue Beers[2], Marianne Gorlyn[1], Nadine Melhem[3], Ainsley Burke[1], Maria Oquendo[4], David Brent[2], John Mann[1]

[1]Columbia University & New York State Psychiatric Institute, [2]University of Pittsburgh/Western Psychiatric Institute, [3]University of Pittsburgh School of Medicine, [4]University of Pennsylvania

Background: The association of various neurocognitive deficits with suicidal behavior in depression is by now reasonably well established (Richard-Devantoy, et al., 2014 & 2015). These deficits are distinct from mood symptoms (Keilp et al., 2001; Keilp et al., 2013), and

are evident both within and outside of depressive episodes (Keilp, et al., 2014). Given that suicidal behavior runs in families (Brent et al., 2015), and that certain traits associated with risk for suicidal behavior run in families as well (Melhem et al., 2007), it is reasonable to ask if those trait-like neurocognitive deficits that are associated with suicidal behavior also run in families, and constitute an enduring, possibly genetically-based, risk factor for self-harm.
Methods: The present study assessed neurocognitive performance in 192 offspring of a parent with both a history of major depression and a past suicide attempt (mean age 19.4 7.6) and in 215 offspring of a parent with a history of major depression but no past suicidal behavior (mean age 19.0 6.4). The majority of these offspring had not experienced an episode of major depression at the time of their assessment, and only a very small number (19 offspring in each group) had exhibited any suicidal behavior. Analyses focused on three measures previously associated with suicidal behavior both within and outside of depressive episodes, measures of cognitive control (standard, computerized Stroop task), memory (Buschke Selective Reminding Test; SRT), and decision making (Iowa Gambling Task; IGT).
Results: Controlling for family membership in a mixed-model design, the offspring of suicide attempter parents performed significantly worse than the offspring of non-attempters on the Stroop task (p=.049) and the IGT (p=.047), with performance on the SRT non-significant (p=.110). If the small number of suicide attempters in each group were removed from the analyses, effect became more significant for the Stroop (p=.030) but marginal for the IGT (p=.080). In exploratory analyses examining interactions with age, IGT differences were significant in offspring under the age of 18 but not over 18; Stroop differences were significant across all ages assessed.
Discussion: Results indicate that mild neurocognitive weaknesses may predate the onset of depressive disorders in these at-risk individuals and contribute to vulnerability for suicidal behavior that interacts with other risk factors, but also runs in families. Poorer performance on the Stroop task now fulfills three of the four criteria of an endophenotypic marker, in that it is (1) evident in attempters, (2) evident outside episodes of depressive illness, and (3) aggregates in families. It remains to be determined if it fulfills the fourth, as a marker for prospective risk in individual offspring who exhibit the most deficient performance. Poor decision making on the IGT appears most prominent in adolescence.

3. NEUROCOGNITIVE FUNCTIONING AND AGGRESSION IN MOTHERS OF ADOLESCENT SUICIDE ATTEMPTERS

Arielle Sheftall*[1], David Brent[2], John Keilp[3], David Axelson[4], Brady Reynolds[5], Kendra Heck[1], Jeffrey Bridge[1]

[1]The Research Institute at Nationwide Children's Hospital, [2]UPMC/ Western Psychiatric Institute & Clinic, [3]Columbia University/NYS Psychiatric Institute, [4]The Ohio State University College of Medicine, [5]University of Kentucky College of Medicine

Background: Neurocognitive deficits have been associated with suicidal behavior, higher lethality suicide attempts, and current suicidal ideation. Interestingly, studies also indicate that neurocognitive deficits exist in non-suicidal first-degree relatives of individuals who have died by suicide. These studies suggest that neurocognitive functioning is one endophenotype associated with suicidal behavior, however, the nature of these impairments and potential role in adolescent suicidal behavior remains unclear. The purpose of this study was to examine the associations of maternal neurocognitive functioning and aggression with adolescent offspring suicidal behavior. It was hypothesized that mothers of adolescent suicide

attempters would exhibit more neurocognitive deficits and higher aggression compared to mothers of non-attempters.
Methods: These data come from a larger study about adolescent suicidal behavior. For this study we focused on biological mothers (n=105) and their adolescents. All families were recruited from community behavioral health services at a children's hospital. Fifty-two adolescent attempted suicide and 53 did not. Mothers completed interview questions, questionnaires, and computer tasks. These tasks included: The Cambridge Neuropsychological Tests Automated Battery(CANTAB), The Iowa Gambling Task(IGT), and The Point Subtraction Paradigm(PSAP).
Statistical analyses conducted independent t-tests, Chi-square ($\chi 2$) tests, and Mann-Whitney U tests where appropriate. Pearson's product-moment correlations were also conducted.
Results: Mothers of adolescent attempters did not differ on demographic/clinical characteristics from mothers of non-attempters.
Differences in neurocognitive functioning were found for the SST task on CANTAB. Mothers of attempters had better inhibitory control during the last half of the SST task compared to mothers of non-attempters (M=217.6, M=191.7; U=1071.0, p=0.05). Levels of aggression also differed. Mothers of suicide attempters reported higher levels of reactive, proactive, and total aggression compared to mothers of non-attempters (reactive:M=8.8 vs. M=6.4,p =0.001; proactive:M=1.9 vs. M=0.9,p =0.01; total:M=2.6 vs. M=3.2, p <0.01). Positive correlations were present between maternal proactive aggression and adolescent proactive aggression(r=0.26,p=0.008), adolescent reactive aggression(r=0.22,p=0.02), and adolescent total aggression (r=0.26, p=0.008).
Discussion: This is the first study to examine maternal neurocognitive functioning and aggression as factors related to adolescent suicidal behavior. Mothers of adolescent attempters were able to better inhibit their response during a stop signal task, but reported higher levels of aggression relative to mothers of non-attempters. Maternal proactive aggression was also positively associated with adolescent reactive, proactive, and total aggressive behavior.
Certain limitations should be considered. The sample was small, included mothers only, and was predominantly White, Non-Hispanic. Therefore, certain effects may not have been detected and results may have limited generalizability.
This study adds to a limited body of literature suggesting that aggression may be one of the behavioral endophenotypes related to the familial transmission of suicidal behavior. Understanding the mechanisms and pathways associated with the familial transmission of suicidal behavior is highly important. Future research should investigate if neurocognitive deficits and aggressive behavior occur early on in childhood for those at high risk due to a parental history of suicidal behavior. These studies may help to determine what age to intervene and what prevention programs are needed.

4. IMPULSIVITY, DECISION-MAKING AND SUICIDAL BEHAVIOUR

Marco Antonio Rios Salinas*[1], Rory O'Connor[1], Jonathan Evans[1]

[1]University of Glasgow

Background: Although there have been significant advances in the psychology of suicidal behaviour in recent decades, there are extensive gaps in our understanding of the transition from suicidal ideation to suicide attempt. Contemporary models of suicide have proposed a number of factors, which facilitate this intention-to-action transition. In this study, we focused on one such factor: decision-making (DM). Despite growing evidence linking aspects

of DM and suicidal behaviour, the nature of this relationship is still unclear. Recent research suggests that impaired DM, risky DM, non-planning, cognitive impulsiveness, and disadvantageous DM, as deteriorations of the fundamental DM process increase the likelihood of suicidal behaviour. This study aims to examine variations in DM processes such as thoroughness, control, hesitancy, social resistance, optimising, principled and instinctiveness and impulsivity across three groups of participants: those with a history of suicidal ideation (SI), those who have attempted suicide (SA), and those with no history of either suicidal ideation or behaviour.
Methods: We recruited 493 adults from the general population aged between 18 and 74 years old (M = 28.7 years; SD = 10.5). Participants completed a standardized measure of DM (Decision-Making Questionnaire – DMQ) that assesses seven dimensions of DM (thoroughness, control, hesitancy, social resistance, optimising, principled, instinctiveness) as well as measures of Impulsivity (UPPS and BARRATT). Suicidal history status was determined from questionnaire responses. The final sample included 143 participants who had a history of suicide ideation, 64 who had attempted suicide, and 286 with had no suicidal history (control). Welch-ANOVAs were conducted to compare the different components of DM and other established suicide risk factors across the three groups.
Results: Analyses of the seven dimensions of the DMQ yielded a number of important differences between the groups. For example, thoroughness (i.e., capacity to take due care and attention to details during the decision-making process) differed significantly across the groups: those in the SA group exhibited higher levels of thoroughness than controls. The control dimension also differentiated between the groups. Specifically, those in the SA group showed higher levels of control (i.e., the management of all external circumstances and factors) than those with no suicidal history. Measures of the attentional construct in the BARRATT scale showed differences between SA and controls. In a similar manner, the SA group showed a greater tendency to fail to think and reflect on the consequences of an act before engaging in the act (UPPS premeditation). Impulsivity measured using the BARRATT scale showed differences among the three groups in constructs such as motor (Involving making quick cognitive decisions), and non-planning (Present Orientation or lack of forethought). Meanwhile the constructs of UPPS scale such as negative urgency, lack of perseverance and positive urgency also reflect important differences among the three groups.
Discussion: The results provide evidence that suicide attempters differed in specific constructs of decision making and impulsivity such as thoroughness, control, attention and lack of premeditation, suggesting that differences in decision making and impulsivity may play a key role in the transition from suicidal intention to action.
A better understanding of this relationship may improve prevention and treatment interventions for suicidal behaviour.

5. DECISION PROCESSES, COGNITIVE DEFICITS, SOCIAL REASONING AND LATE-LIFE SUICIDE: POSSIBLE LINK TO PRODROMAL DEMENTIA

Katalin Szanto*[1], Alexandre Dombrovski[2], Hanga Galfalvy[3]

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Background: Among suicide attempters, cognitive impairments are most consistently associated with medically-serious attempts that most closely approximate death by suicide, and are more prevalent in older age. Cognitive deficits impair decision-making in complex or changing environments. Impairment in social cognition may distort social cues, leading to impaired empathy and loss of insight as in patients with behavioral variant fronto-temporal

dementia (bvFTD), marked by change in cognition, social functioning and personality. We will provide data from two complementary lines of investigation on the possible link between cognitive deficits, social reasoning and late-life suicidal behavior.
Methods: Study 1 sought to examine how cognitive, decision making, dispositional, and environmental factors may potentiate or mitigate each other's effect on suicide risk status in late-life depression. We performed a cluster analysis and validated these clusters using past and prospective suicidal ideation and behavior in a sample of 194 depressed older (50+) adults and 57 non-psychiatric subjects as a reference group. Participants with diagnosed dementia were excluded. Study 2 sought to expand our earlier findings of deficits in recognizing complex social emotions and social context integration. We have reported that during an economic exchange game, medically serious suicide attempters did not modulate their responses based on reward magnitude, leading to self-defeating behavior. As empathy towards significant others is a powerful deterrent to suicide, we examined the role of empathy in older suicide attempters using an adaptation of a behavioral exchange game (Ultimatum Game), where social context is provided for monetary offers to evoke either prosocial or punishing behaviors. Previous research has shown that bvFTD patients were impaired in modulating their decisions in response to social contextual information. We will be presenting data on this task, where in addition to fairness levels, stake size and social context were also manipulated.
Results: Study 1: Of the five clusters identified three were associated with high suicide risk, two of which (clusters 1 and 3) were related to cognitive deficits: Cluster 1 participants had a profile that resembles prodromal dementia with an age of onset of depression 18 years later than in Cluster 4 (predominantly personality-based risk factors, no cognitive deficits). Cluster 1 participants had a mix of cognitive, personality and environmental risk factors, poor social problem-solving skills, and deficits in decision competence. Cluster 3 participants had moderately severe cognitive deficits and were characterized by short-sighted decision making. There were significant between-cluster differences in number ($p<0.001$) and lethality ($p=0.002$) of past suicide attempts, as well as likelihood of future suicide attempts ($p=0.010$, 30 attempts by 22 participants, two fatal) and emergency hospitalizations to prevent suicide ($p=0.005$, 31 participants). The two cognitively impaired clusters had the highest number of future suicide attempts. Study 2: To date 102 participants, including 37 attempters completed the game. We will present data whether older suicide attempters have deficits in more "basic" reward processing (i.e. offer magnitude effect) versus deficits in more complex social rewarding processes.
Discussion: There are multiple pathways leading to suicidal behavior in older age. Three pathways were identified in study one, marked by (1) very high levels of cognitive and dispositional risk factors suggesting a dementia prodrome, (2) dysfunctional personality traits, (3) impulsive decision-making and cognitive deficits.

6. THOUGHT-ACTION FUSION: A NOVEL BIAS IN SUICIDAL DEPRESSION?

Bergljot Gjelsvik*[1], Nils Kappelmann[1], Tilmann von Soest[2], Verena Hinze[1], Keith Hawton[1], Catherine Crane[1]

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Background: Suicidal cognitions are common among people seeking health care and to some degree in the general population. However, whilst for some they are more fleeting and temporary, for others they tend to persist and cause considerable distress. What makes suicidal thoughts distressing and aversive for a subset of suicidal people, but not for others, is poorly understood. Given that suicidal cognitions precede suicidal acts, understanding the

conditions predicting persistence and exacerbation of suicidal cognitions is critical in understanding the transition from ideation to acts. Our key theoretical premise is that vulnerable individuals' biased way of relating to suicidal intrusions is critical in determining whether suicidal cognitions persist and potentially escalate. This reactivity hypothesis echoes models of Obsessive-Compulsive Disorder (OCD), in which distressing and intrusive thoughts are a core symptom. One maladaptive thought bias in OCD with potential relevance for suicidally depressed patients is thought-action fusion (TAF), i.e., the belief that having intrusive thoughts has real life consequences. The biased misinterpretations of the significance of suicidal thoughts might promote strategies (e.g., suppression, worry, rumination) to control them, however such control strategies can backfire. Despite wide use clinically, the psychometric properties of the original TAF scale and clinical applications of TAF outside OCD is limited. The objectives of the present study were to 1) develop and validate a TAF scale adapted to include suicidal thoughts and 2) to assess levels of general TAF and subdomain TAFs in individuals with a history of suicidal depression compared to clinical and non-clinical controls.
Methods: Using a cross-sectional design, we obtained data on 361 participants through an online survey. Participants (18-70 years, fluent in English, and providing informed consent) were split into groups of depressed suicidal (D-S, n= 97), depressed non-suicidal (D-NS, n= 134) and healthy controls (HC, n=130). Inclusion in the D-S and D-NS groups required a minimum of ≥ 3 episodes of depressive episodes, being currently well, and a reported history of recurrent suicidal ideation and/or behaviour (D-S). Exclusion criteria were lifetime symptoms of a) OCD, b) substance abuse, c) bipolar disorder, and d) a diagnosis of schizophrenia. The original TAF-Suicidal Revision (TAF-SR) consisted of 30 items including the subdomains self vs. other, positive vs. negative, suicidal vs. non-suicidal and events that are under one's control vs. out of one's control, validated using exploratory (EFA) and confirmatory factor analysis (CFA).
Results: EFA revealed a 3-factor solution: Uncontrollable, Self-Suicidal and Positive Controllable. Following item reduction, CFA was conducted on the 20-item version of the TAF-SR, replicating the same structure. TAF-SR shows good to excellent internal validity (RMSEA = 0.044, [90% CI = 0.035, 0.052]) for all hypothesised and factor-based subscales with the exception of positive controllable items. Compared to HCs, TAF was significantly higher in the D-NS sample for the total score, the uncontrollable subscale, and the self-suicidal subscale while it was lower for the positive controllable subscale (all $P<0.05$). Contrary to this, the D-S sample was only different from HC on the self-suicidal subscale ($P<0.05$).
Discussion: Our newly developed scale TAF-SR captures clinically important distinctions between healthy controls and individuals with a history of depression and/ or suicidality. This suggests potential differentiation between different clinical and non-clinical groups and points to TAF as a promising clinical target in this population.

LARGE SCALE STUDIES ON MILITARY SUICIDALITY

Chair: Amy Byers, University of California, San Francisco / SFVA

1. THE MILITARY SUICIDE RESEARCH CONSORTIUM COMMON DATA ELEMENTS: PSYCHOMETRIC SUPPORT, CLINICAL, AND RESEARCH UTILITY

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[1]Rocky Mountain Mental Illness Research, Education and Clinical Center, [2]Florida State University

Background: The U.S. Department of Defense funded Military Suicide Research Consortium's (MSRC) created a set of common data elements (CDE) in 2010 which are required to be used by all funded PIs. The goal was to balance broad coverage with the least burdensome set of items deemed practical. Domains covered by the CDEs will be presented, rationale for item selection, data in support of the psychometric properties, and alignment with other large scale efforts to gather similar types of common data. The MSRC CDE allow data to be aggregated across large numbers of studies with differing methodologies for the purposes of testing mediation and moderation or exploring other research questions not included in the parent study hypotheses.
Methods: All MSRC funded studies are required to include the CDE in their assessment protocols as a self-report measure. The domains covered include depressive symptoms, suicide-related thoughts and behaviors, suicide intent, hopelessness, thwarted belonging, anxiety sensitivity, PTSD symptoms, sleep problems, TBI sequelae, and alcohol use. To date, CDE data have been gathered from 21 studies and 3140 participants. Participants are primarily male (75.6%) and active duty or reserve (53.2%). Of the active duty participants, approximately 25% are Army, 24% Army Reserves, 14% Navy, 7% Marines, and the remainder from other reserve and National Guard components. Veterans comprise 33.4% of the sample, with the remainder (11.6%) civilians. Participants' mean age is 34.89 (SD = 14.80, range = 17-88). Internal consistency reliability analyses were run along with cross-scale correlations, and an exploratory factor analysis. For items for which there is corresponding full scale data from a sufficient number of studies to conduct analyses, correlations between the extracted items and full scales were conducted.
Results: Overall internal consistency reliability estimates were acceptable at or above .70. Correlations between item sets tapping each domain ranged from low to moderate, and generally supported convergent validity. Results of the exploratory factor analysis indicated a 9-factor solution generally conforming to the domains determined when the CDEs were assembled. Suicide-related thoughts and behaviors separated into a current suicidality factor and a past suicidality/intent factor. Support was found for the short versions (compared to the full scales) of the Modified Scale for Suicide Ideation, Beck Hopelessness Scale, Interpersonal Needs Questionnaire Thwarted Belongingness, PTSD Checklist, and Alcohol Use Disorders Test.
Discussion: Psychometric support was found for the CDEs and determined they are assessing the domains for which items were selected. Many of the shortened versions of measures from which items were selected demonstrate good psychometric properties. Advantages for both research and clinical use of the CDEs in military populations include a psychometrically valid, brief measure to assess suicide risk and related factors. Administration and scoring of the CDEs are quick and straightforward. The MSRC CDEs are a promising tool to aid clinicians working with service members at risk of suicide and to increase the value of suicide-specific research.

2. COMBAT EXPERIENCES AND SUICIDE ATTEMPTS IN A LARGE US MILITARY COHORT

Cynthia LeardMann[1], Rayna Matsuno[1], Edward Boyko[2], Dennis Faix[3], Teresa Powell*[1], Charles Hoge[4]

[1]Henry Jackson Foundation, [2]Department of Veterans Affairs Puget Sound & Seattle ERIC, [3]Naval Health Research Center, [4]Walter Reed Army Institute of Research

Background: Debate still remains about the potential role that military deployment may play in association with suicidal behaviors. However, while the evidence is limited, it has been suggested that specific deployment-related factors, especially individual combat experiences, rather than deployment itself, may increase the risk for suicidal behaviors.
Methods: The aim was to examine combat experiences and identify other potential risk factors in relation to suicide attempts among a sample of active duty US Service members who had deployed. The study population included active-duty service members from the first four panels of the Millennium Cohort Study who deployed in support of the operations in Iraq and Afghanistan (n=86,420). Suicide attempts among survey respondents were determined by linking to military electronic medical encounter data using codes from the International Classification of Diseases (ICD), Ninth revision. Combat experience was assessed using 13 items from the 2007-2008 and 2011-2013 Millennium Cohort questionnaires (e.g., being attacked or ambushed, being wounded or injured, and knowing someone seriously injured or killed). Combat experiences were examined as individual factors and as the total number of combat experiences (e.g., none, 1-3 types of experiences, 4-6 types of experiences, 7+ types of experiences). Descriptive analyses and Cox proportional hazards time-to-event modeling were performed to compare demographic, military-specific, behavioral, and combat experience factors by suicide attempts among participants.
Results: Of the 61,031 study participants, 246 were identified as having a suicide attempt in the medical records during the study time frame. All the demographic, military-related, mental health, and physical health characteristics were significantly associated with attempting suicide, except race/ethnicity. Those who reported seven or more combat experiences had significantly increased risk compared with those who reported no combat. However, once adjusting for mental disorders (i.e., PTSD/depression, panic/anxiety), while still elevated, the association between combat severity and attempting suicide was no longer statistically significant. In separate unadjusted models, only one combat item (e.g., being attacked or ambushed) remained significantly associated with suicide attempts after adjustment.
Discussion: While combat severity was found to be associated with incident suicide attempts, these findings suggest a more complex relationship may exist. While experiencing numerous types of combat experiences during a deployment elevates the risk of a suicide attempt, this association seems to be mediated by mental disorders, specifically depression. It has been well-established that experiencing combat increases the risk of post-deployment mental disorders. These current findings suggest that the direct association is between depression and suicide attempts, not combat and suicide attempt. Many of the risk factors related to an increased risk of suicide attempts are similar to those found in civilian populations, such as mental disorders, sexual assault, lower education level.

3. PREDICTORS OF SUICIDE ATTEMPTS IN LATE LIFE: A STUDY OF U.S. VETERANS

Amy Byers*[1], Yixia Li[2], W. John Boscardin[1], Kristine Yaffe[1]

[1]University of California, San Francisco / SFVA, [2]SFVA

Background: While much attention is rightfully being placed on the mental health needs of younger Veterans with suicidality returning from combat, recent surveillance data from the Department of Veterans Affairs Suicide Prevention Program suggests that older Veterans are most at risk of dying by suicide and in need of care. Since 2008, the VA has mandated medical centers track serious suicidality (e.g., serious suicide ideation, plans, and attempts) and enter information in a national database, the Suicide Prevention and Application Network

(SPAN). The primary objective of our study is to examine the predictors of suicide attempts in older Veterans using SPAN.
Methods: We studied over 4 million older Veterans from the Department of Veterans Affairs (VA) National Patient Care Database starting in fiscal year (FY) 2012 (baseline) and assessed 3 years of follow up (FY 2013-2015). Analyses included all patients 50 years and older (mean age (SD)=68.1 (10.6) years and 5.6% women) who were regular users of VA medical centers in the United States. Baseline suicidal behavior, including ideation only, plan with or without ideation, and attempt with or without a plan, were identified; suicide attempts at follow up were also identified through the SPAN database. Comorbid conditions were determined using International Classification of Diseases 9th edition (ICD-9) codes. We used Cox proportional hazards models to identify important predictors of suicide attempts in late life, which included examination of demographics, prior suicidal behavior, and medical and psychiatric disorders.
Results: Of the 4 million Veterans, nearly 7,000 had baseline suicidal behavior and over 9,000 had a suicide attempt at follow up. The mean age (SD) of Veterans who attempted suicide during follow up was 59.1 (7.4) years. Of the 9,237 Veterans who attempted suicide, 92% had no prior suicidal behavior at baseline; however, almost 90% had a baseline psychiatric disorder (compared with 40% for those with no suicide attempt), with nearly 50% having 3 or more comorbid psychiatric disorders and over 30% having 3 or more medical disorders. In an overall model of covariates, hazard ratios (HRs) for risk of suicide attempt were substantially and significantly ($P < .05$) elevated for the following variables: baseline suicidal behavior (HRs, ideation=6.36, plan=9.40, and prior attempt=10.32), medical disorders (HRs, traumatic brain injury=1.34, dementia=1.18, cerebrovascular disease=1.14, chronic pulmonary disease=1.14, and renal disease=1.10), and psychiatric disorders (HRs, bipolar disorder=2.61, depression=2.55, drug abuse=2.15, alcohol abuse=1.79, and posttraumatic stress disorder=1.39). When considering multiple morbidity, there was an over 50% increased risk of suicide attempt for Veterans with 3 or more significant medical disorders compared with those without these disorders and a 13-fold increased risk for those with 3 or more psychiatric disorders.
Discussion: Findings suggest that Veterans who attempt suicide later in life have substantially more comorbidities, particularly multiple psychiatric morbidity, than those who do not attempt suicide. Moreover, these results highlight the importance of medical conditions, independent of psychiatric disorders, when assessing risk of suicide, with neurocognitive disorders of particular concern.

4. THE HOME PROGRAM: ENGAGING VETERANS IN CARE FOLLOWING PSYCHIATRIC HOSPITALIZATION

Bridget Matarazzo*[1], Jeri Forster[2], Trisha Hostetter[1], Geri Adler[3], Linda Ganzini[4], David Oslin[5], Lisa Brenner[1]

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Background: The weeks following psychiatric hospitalization is an extremely high risk period of time for death by suicide in the Veteran, military and civilian populations. Lack of treatment engagement following hospitalization further exacerbates risk. The Home-Based Mental Health Evaluation (HOME) program was developed to provide support during this transition in care. The HOME program is a suicide prevention intervention for Veterans specifically aimed at increasing treatment engagement and decreasing suicide risk following

psychiatric hospitalization. Veterans in the HOME program receive a phone call the first day post-discharge, a home visit during the first week and weekly phone calls thereafter until they are engaged in outpatient mental health care. Each contact typically includes: thorough suicide risk assessment, review and modification of Veteran's safety plan and discharge plan/upcoming appointments, and problem-solving around barriers to engaging in care.
Methods: The HOME program was evaluated using a two-arm interventional trial design in which the effectiveness of the HOME program at two Department of Veterans Affairs Medical Centers (VAMCs; n=166) was compared to enhanced care as usual (E-CARE) at two additional VAMCs (n=136). The primary outcome of interest was treatment engagement. Treatment engagement data were collected 90 days post-discharge via the VA's Corporate Data Warehouse, which contains clinical and administrative data.
Results: The odds of engaging in care post-hospitalization for those in the HOME program are 3.15 (95% CI: 1.05, 9.48) times the odds for those in E-CARE (p=0.045). Participants in the HOME program are estimated to have attended 37% more individual MH appointments (95% CI: 0.2%, 88%; p=0.049) than those in the E-CARE group, controlling for inpatient length of stay. Participants in the HOME program are estimated to have attended 18% more group MH appointments (95%CI: -59%, 340%; p=0.65) than those in the E-CARE group, controlling for inpatient LOS and employment status, although this finding was not statistically significant.
Discussion: The HOME Program is an innovative suicide prevention intervention that aims to engage Veterans in care in order to mitigate suicide risk. Data suggest that Veterans who participate in the HOME Program are more likely to engage in care post-hospitalization and attend more individual mental health appointments as compared to the E-CARE group. The presenter will discuss future research and implementation efforts of the HOME program.

5. WINGMAN-CONNECT: UNIVERSAL SUICIDE PREVENTION FOR AIR FORCE TRAINEES

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Background: Social disconnection and relationship disruptions are major precipitants for military suicides (DoD, 2012). However, most of military suicide prevention focuses on a narrow range of selective and indicated strategies (e.g., treatment for high risk groups). Further, few suicide prevention programs have been adapted for military populations. Universal prevention approaches are needed that proactively strengthen social connectedness and skills to grow and sustain relationships in the context of service demands. This study reports results from a DoD-funded project to systematically adapt a universal suicide prevention program based on a social connectedness framework (Sources of Strength; Wyman et al., 2010) for Air Force personnel.
Methods: We used an iterative, dynamic process to adapt the content and implementation of Sources of Strength for Airman-in-Training in technical training. We enrolled 10 cohorts over 18 months. In each cohort, 25-35 AiTs were enrolled and received 5 hrs. of training in modules adapted from Sources of Strength aimed at strengthening connectedness and interpersonal coping resources. Each cohort was evaluated on multiple indicators including training completion. Participants completed assessments of class cohesion prior to training and at 1-month follow-up, and measures of knowledge retention and preparation to apply

skills. Data were used to revise and improve training modules and evaluate progress of the adaptation in improving engagement of the AiT population and potential for modifying class cohesion, a key proximal target.
Results: Across 10 cohorts, 296 Airman-in-Training were enrolled from 29 Technical training classes. After cohort 4, a curriculum revision introduced modules to promote class cohesion through group activities during and outside training. Following introduction of new modules, rates of participant completion of training increased from 78% (cohorts 1-4) to 95% (cohorts 5-10). Retention of core concepts (active recall) increased by 20% as did self-reported preparation to apply concepts after training. Class cohesion change scores (pre-training to 1-month) doubled in size after cohort 4 (0.5 SD to 1.0 SD). The resulting intervention (Wingman-Connect) focuses Airman-in-Training on building protective factors in: Kinship (healthy bonds); Guidance (support from mentors and mental health); Purpose (goals, sense of being valued and valuable); Balance (self-care and support). Half of the training is focused on the class as a group to build belonging and shared purpose.
Discussion: Through a data-driven, iterative process, Sources of Strength training was adapted for young enlisted AF personnel that focuses substantially on enhancing unit belonging and shared purpose as building blocks for social connectedness. The focus on the unit is congruent with military culture training. The association between increased unit focus and greater AiT retention and self-reported benefit from training suggest that belonging and purpose may be strengthened optimally through 'in-vivo' interactive exercises with natural organizational units, rather than as individual skills. The data suggest the adaptation process improved the potential for this 'upstream' suicide prevention program to enhance social protective factors in the US Air Force. Results showing improvements in the intervention over time contributed to enthusiasm of AF leaders in the project and approval to transition to an RCT phase to test the adapted program including on reducing risk for suicidal behavior. Our findings point to the value of engaging military partners in a careful adaptation process of prevention programs for military settings.

6. THE MILITARY SUICIDE RESEARCH CONSORTIUM COMMON DATA ELEMENTS: AN EXAMINATION OF MEASUREMENT INVARIANCE ACROSS ENLISTED SERVICE MEMBERS, YOUNGER VETERANS, AND OLDER VETERANS

Thomas Joiner[1], Peter Gutierrez*[2]

[1]Florida State University, [2]Rocky Mountain Mental Illness Research, Education and Clinical Center

Background: Suicide rates within the U.S. military are elevated, necessitating greater efforts to identify those at increased risk. The Military Suicide Research Consortium (MSRC) recently developed a standardized battery of self-report measures of suicide-related behaviors and conditions, referred to as the Common Data Elements (CDEs). This study examined measurement invariance of the CDEs across enlisted service members, younger Veterans, and older Veterans.
Methods: Merged data from 773 enlisted service members, 248 younger Veterans (<35 years), and 634 older Veterans (>35 years) were utilized. Risk factors assessed included suicidal ideation, suicidal intent, insomnia, PTSD symptoms, alcohol misuse, traumatic brain injury symptoms, anxiety sensitivity, and thwarted belongingness. A five-step multiple-group confirmatory factor analysis tested for measurement invariance of the MSRC CDEs across these groups.

Results: Partial measurement invariance was supported with good model fit observed for enlisted service members (RMSEA = 0.047, CFI = 0.935, TLI = 0.928, SRMR = 0.044), younger Veterans (RMSEA = 0.054, CFI = 0.925, TLI = 0.917, SRMR = 0.061), older Veterans (RMSEA = 0.051, CFI = 0.936, TLI = 0.928, SRMR = 0.039), and the combined Veteran group (RMSEA = 0.049, CFI = 0.940, TLI = 0.933, SRMR = 0.036). The structures of all models were generally comparable; however, suicide plans and impulses evinced stronger factor loadings for enlisted service members compared to younger and older Veterans.
Discussion: Findings indicate that the MSRC CDEs demonstrate comparable and good model fit for enlisted military service members and Veterans, regardless of age. Thus, the CDEs can be used validly across military and Veteran populations. Given similar latent structures, research findings in one group may inform clinical and policy decision-making for the other.

CORRELATES & CHARACTERISTICS OF SELF-HARMING & SUICIDAL BEHAVIOR

Chair: Olivia Kirtley, Ghent University

1. INITIAL VALIDATION OF THE SELF-DIRECTED VIOLENCE PICTURE SYSTEM (SDVPS)

Sarra Nazem*[1], Jeri Forster[1], Lisa Brenner[1]

[1]Rocky Mountain MIRECC, Denver VAMC

Background: In order to improve our understanding of who is at greatest risk for death by suicide, it is imperative that new innovative assessment tools are created to facilitate behavioral measurement of key constructs associated with increased risk for self-directed violence (SDV). Capability to engage in SDV is conceptualized as a key risk factor for SDV across three current theories of suicide (Klonsky & May, 2015; Joiner, 2005; O'Connor, 2011; O'Connor & Nock, 2014; Van Orden et al., 2010). Despite this consensus, the broad construct of capability has received little vigorous empirical support to demonstrate proof of concept, in part due to methodological limitations on how to best assess the construct, especially beyond self-report. Continued heavy reliance on self-report methodology of capability may hinder our ability to ascertain important neurobehavioral differences that may be an important component of the construct. Furthermore, there is a growing need to develop tools that can be used in tandem with behavioral indicators of suicide risk to improve the prediction of acute risk for suicide (Glenn & Nock, 2014). Previous researchers (e.g., Franklin et al., 2014; Smith et al., 2010) have attempted to use non-suicidal self-injury or suicide images in behavioral tasks (e.g., implicit association test, startle reflex tasks, facial electromyography), but conclusions from these studies have been limited as the images used within these tasks were not validated.
Methods: The aim of the current study was to develop and validate a set of suicide-specific images that could ultimately be used in future behavioral assessments of suicide risk. The Self-Directed Violence Picture System (SDVPS) consists of 11 images that portray possible methods of death by suicide including drowning, burning, hanging, jumping, poison gas, and asphyxiation. Participants were 119 United States military veterans (84% male, mean(SD) age = 46.5(13.5), 72% deployed, 49% exposed to combat). Participants provided valence, arousal, and dominance ratings on the SDVPS using the Self-Assessment Manikin (Bradley & Lang, 1994; Lang, 1980), a non-verbal pictorial assessment technique commonly utilized to measure the valence, arousal, and dominance associated with a person's affective reaction

to images. These ratings were compared to International Affective Picture System (IAPS) negative, neutral, and positive images.
Results: SDVPS images were rated with significantly greater negative valence and elicited decreased feelings of being in control than IAPS positive (valence: $p < .001$, $d = 2.57$; control: $p < .001$, $d = .55$), IAPS negative (valence: $p = .03$, $d = .19$; control: $p = .001$, $d = .30$), and IAPS neutral images (valence: $p < .001$, $d = 2.07$; control: $p < .001$, $d = .60$). SDVPS images were also rated with significantly greater arousal than IAPS neutral images ($p < .001$, $d = .57$). SDVPS ratings did not differ by key demographic and psychiatric characteristics including race, current mood or anxiety disorder, and deployment and combat experience. Participants did not experience an increase in urge to harm ($t(118) = -0.22$. $p = .83$) or intent for suicide ($t(118) = 0.33$, $p = .74$) from pre- to post-assessment.
Discussion: Initial validation data supports that the SDVPS images functioned as intended and can be used safely in Veteran samples with current and past psychiatric diagnoses and risk for SDV. Although continued validation of the SDVPS in other populations is necessary, the SDVPS may become a new tool by which researchers can begin to systematically and reliably examine reactions to suicide-related content using behavioral and/or experimental paradigms.

2. SUICIDAL BEHAVIOUR AND DELIBERATE SELF-HARM IN HELP-SEEKING YOUNG PEOPLE: A CROSS-SECTIONAL EXPLORATION OF DEMOGRAPHIC AND CLINICAL ASSOCIATIONS

Cate McHugh*[1], Nicholas Glozier[1], Ian Hickie[1]

[1]Brain and Mind Centre, University of Sydney

Background: Suicide is the second leading cause of mortality in young people. Deliberate self-harm is common in young people, and there is evidence that prevalence is increasing in this population. A move to early intervention in psychosis and mood disorders in Australia, has led to the development of primary mental health care centres, headspace, for young people aged 12-30 years old. It remains unclear how current knowledge of suicidal and self-harm behaviours from population studies should be applied in this new clinical setting. Criticism of this new early intervention model has suggested it diverts limited resources to populations of young people without serious psychopathology.
Methods: The current study used cross sectional data from a longitudinal cohort study. Between January 2011 and August 2012, young people presenting to one of the four primary mental health centres in Sydney or Melbourne were invited to participate. Participants were young adults (N=802) aged between 15 and 25 years (M=18.3 years, 66% female). Deliberate self-harm was defined as intentional self-harm without suicidal intent, a suicide attempt as self-harm with suicidal intent.
Results: Of the 802 participants 38% had engaged in a suicidal or self-harm behaviour in the previous 12 months, which represented 36% engaging in DSH and 14% having made a suicide attempt. There was high comorbidity between self-harm behaviours with and without suicidal intent. Methods of harm differed by gender. While cutting or burning (64% vs 64%) and overdosing or poisoning (21% vs 20%) were equally common in males and females, battery (27% vs 8%) and high risk behaviours (32% vs 13%) were more common in males than females.
Moderate to high suicidal ideation was common at the time of presentation to services, and was associated with a significantly increased likelihood of having made a suicide attempt (OR 10.7, CI 6.2-18.4), or self-harmed (OR 5.9, CI 3.8-9.3) in the last 12 months. Depression (OR 2.6, CI 1.7-4) and anxiety (OR 1.8, CI 1.2-2.8) were similarly associated with increased

likelihood of suicidal behaviour in the last 12 months. Using a transdiagnostic clinical staging approach, more progressed stage of illness was associated with significantly increased likelihood of having made a suicide attempt (OR 3.8, CI 2.0-7.4), but not deliberate self-harm.
Discussion: Sociodemographic and clinical associations of suicidal and self-harm behavior in young people were largely the same in this cohort of young people seeking primary mental health care, as in large population studies. 12-month prevalence of suicidal and self-harm behaviours in this primary care cohort of young people was more in keeping with prevalence that would be expected in a sample of adults in psychiatric inpatient care. The transdiagnostic clinical staging approach may be used to target more intense suicide prevention interventions to young people with more progressed mental health syndromes, regardless of current suicidal intent. Early intervention in mental illness and prevention of progression of clinical stage may be a promising approach to preventing young people engaging in suicidal behaviour.

3. STRESS REACTIVITY IN SUICIDE ATTEMPTERS WITH CHILDHOOD HISTORY OF CONDUCT PROBLEMS

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Background: While suicidal individuals share some risk factors, they are a heterogeneous population. Identifying individual differences among suicide attempters is of paramount importance, as it can facilitate more accurate evaluation of risk factors and consequent prevention. One of the central neurobiological mechanisms found to be related to suicide is the dysregulation of the stress response system. However, studies have yielded contradictory results regarding the pattern of this dysregulation, possibly pointing to the existence of subtypes of suicidal individuals that differ in their HPA activity. The primary aim of the present study was to identify whether different patterns of physiological stress response exist among adult suicide attempters with a history of childhood conduct problems. Our second aim was to evaluate the link between HPA activity and the nature of past attempts, and whether this relationship differs among attempters with and without a history of conduct problems.
Methods: Participants were 84 individuals who had at least one suicide attempt in their lifetime or NSSI. Participants' diagnoses were evaluated using the SCID-I and their cortisol reactivity was assessed using the Trier Social Stress Test. Cortisol measures were basal cortisol, peak change and area under the curve (AUC). Participants also completed self-report questionnaires assessing history and characteristics of suicide attempt, history of aggression, and history of childhood abuse.
Results: There were three groups: suicide attempters with a history of conduct problems (n=33), suicide attempters without such history (n=27) and non-attempters (n=24). There were no significant differences among the groups in demographics, history of abuse nor prevalence of PTSD and major depression. With respect to cortisol level, suicide attempters with a history of childhood/adolescence conduct problems had significantly lower response to stress than both suicide attempters without such history as well as non-attempters, when measured by peak response and AUC. The groups did not differ in their basal cortisol. Furthermore, attempters' AUC cortisol was significantly related to lethality of past attempts in general, and peak cortisol was related to lethality of past attempts only among attempters with a history of conduct problems.

Discussion: These results support the hypothesis that a unique subtype of suicide attempters that are characterized with specific physiological stress response exist. This result, at least partially, sheds light on the inconsistencies in findings regarding the relation between dysregulation of the stress response system and suicidal behavior, and emphasizes the importance of considering factors that are known to affect the stress regulation physiological system when assessing the relation between HPA axis activity and suicide.

4. EXPOSURE TO SELF-HARM: DIFFERING RELATIONSHIPS WITH SELF-HARM IDEATION, ENACTMENT, AND INTENT

Olivia Kirtley*[1], Lisa Marzano[2], Ronan O'Carroll[3], Rory O'Connor[4]

[1]Ghent University, [2]Middlesex University, [3]University of Stirling, [4]University of Glasgow

Background: Identifying variables that differentiate between individuals who think (ideate) about suicide without acting upon their thoughts, and those who engage in (enact) suicidal behaviors, is critical for suicide research and prevention. The Integrated Motivational-Volitional model of suicidal behavior (O'Connor, 2011) highlights exposure to others' self-harm as a potential volitional phase variable, differentiating between ideation and enactment. Study 1 investigated whether exposure to others' self-harm differentiates between ideation and enactment groups. Much previous work has focused on presence vs. absence of exposure to self-harm, but few studies have investigated the nuances of whether particular types of exposure are more or less deleterious, and whether there are differences in the types of self-harm behaviors individuals engage in, according to exposure type. Study 2 investigated whether particular types of exposure were differentially associated with non-suicidal self-injury (NSSI) only or self-harm of mixed (suicidal and non-suicidal) intent.
Methods: Study 1: 386 adults (university students and individuals from the general population) completed a battery of online questionnaires in a cross-sectional study, assessing self-harm thoughts and behaviors, defeat, entrapment, humiliation, hopelessness, depressive symptoms, impulsivity and whether participants had friends or family who had self-harmed (exposure).
Study 2: 499 adults (university students and individuals from the general population) took part in an online cross-sectional study of public attitudes towards self-harmful behaviors. Participants completed an adapted version of the Level of Contact Report (Corrigan et al., 2001) to assess exposure to self-harm via various mediums, including the internet, friends and family. Lifetime history of NSSI and suicidal thoughts and behaviors were also assessed.
Results: Study 1: Univariate multinomial logistic regression analyses showed that all variables differed significantly between ideation and enactment groups. In multivariate analyses, however, only exposure remained significant and differentiated between ideation and enactment groups; exposed individuals were 1.7 times more likely to have engaged in self-harm behaviors themselves, vs. ideation alone.

Study 2: Multivariate analyses revealed those with internet self-harm exposure were more likely to be in the control vs. mixed intent group. When individuals engaged in self–harm, it was more likely to be NSSI rather than mixed intent. Individuals reporting frequent self-harm observation were more likely to be in the control group than to have self-harmed with mixed intent. When exposed to friends' self-harm, individuals were more likely to be in the control group than NSSI or mixed intent groups. For exposure to family self-harm, individuals were more likely to be in the control group than to have engaged in NSSI. If individuals had engaged in self-harm, it was more likely to be NSSI rather than with mixed intent.

Discussion: The findings from Study 1 demonstrate that exposure to others' self-harm is able to differentiate between individuals who ideate about, and those who enact self-harm behaviors. Furthermore, it is a stronger correlate than other variables associated with self-harm, including impulsivity. This highlights the need for effective postvention, as individuals who know others who have engaged in self-harm behaviors are at elevated risk of self-harm. Study 2 suggests that the picture is nuanced regarding differential effects of particular types of exposure upon self-harm. Specific mediums of exposure may be more associated with genesis as opposed to maintenance or escalation of self-harm behavior.

5. PERCEPTIONS OF SOCIAL RANK AND SUICIDAL IDEATION: INVESTIGATING HOW A CHANGE IN RANK AND DESIRE FOR HIGHER RANK IS RELATED TO DEFEAT, ENTRAPMENT AND SUICIDAL IDEATION

Karen Wetherall*[1], Rory O'Connor[1], Kathryn Robb[1]

[1]University of Glasgow

Background: Perceptions of being a lower social rank than others may be associated with feelings of defeat, entrapment, and suicidality. Indeed, defeat and entrapment have been linked to suicidal thoughts and behaviours, and have been highlighted within contemporary models of suicidal behaviour, including the Integrated Motivational-Volitional Model (IMV). Thus far, limited research has investigated how an individual perceives their current social rank, compared with past rank and future rank, and how these are related to suicidal ideation. Therefore, in the present study, we investigated whether a perceived reduction in social rank and a desire for higher social rank would be associated with suicidal ideation. Additionally, we predicted that the relationship between these social rank variables and suicidal ideation would be mediated by feelings of defeat and entrapment.
Methods: Utilising a cross-sectional design, participants (n = 428) completed an online survey with suicidal ideation as the main outcome variable. They also completed a modified version of the Social Comparison Scale, asking an individual to rank how they 'currently feel', 'used to feel in the past' and 'would like to feel in the future' compared to others on the dimensions of attractiveness (e.g., undesirable – desirable), social rank (e.g., inferior – superior) and group fit (e.g., left out – accepted). From these ratings we calculated a Relative Rank (RR; current perceived rank minus previous perceived rank) and a Desired Rank (DR; future desired rank minus current rank) score. Linear regression was employed to investigate the relationships between RR and DR with suicidal ideation. Two multiple mediation models were tested using Hayes PROCESS macro, controlling for depressive symptoms. In model 1 RR was entered as the predictor and in model 2 DR was entered as the predictor, with defeat and entrapment as mediators and suicidal ideation as the outcome in both.
Results: Initial linear regression analyses indicated that a lower RR (i.e., feeling that your rank had decreased) was associated with an increase in suicidal ideation. Additionally, being higher on DR (i.e., feeling that you want to be of higher rank) was also associated with higher suicidal ideation. In model 1, lower RR was independently associated with higher defeat and entrapment, controlling for depressive symptoms. A further regression analysis indicated that entrapment, but not defeat, mediated RR's relationship with suicidal ideation. As the direct effect of RR on suicidal ideation remained significant this indicates partial mediation only. Similarly, Model 2 indicated that higher DR was independently associated with higher defeat and entrapment, controlling for depressive symptoms. The model also indicated that entrapment, but not defeat, mediated the relationship between DR and suicidal ideation. As the direct effect was no longer significant, this suggests full mediation.

Discussion: Support was found for both the models tested. These findings are novel, as there is limited research investigating the impact of a perceived reduction in social rank and the desire for higher rank upon suicidal ideation. The models explored also lend support to facets of the IMV model, in particular indicating that entrapment is most strongly associated with suicidal ideation. Indeed, from a clinical perspective, an individual feeling trapped by their circumstances is a clear target for assessment of risk of suicidal ideation and subsequent behaviour. Additionally, clinicians and others in contact with suicidal individuals should develop an awareness of how an individual's perception of their social position may impact upon feelings of entrapment and subsequent suicide risk.

6. AN INVESTIGATION INTO THE RELATIONSHIP BETWEEN SELF-COMPASSION, SUICIDAL IDEATION AND SELF-HARM

Seonaid Cleare*[1], Andrew Gumley[1], Rory O'Connor[1]

[1]University of Glasgow

Background: Despite major advances in understanding the psychology of suicidal behaviour there are many gaps in our knowledge. In particular, the evidence for factors that may protect against suicide risk is limited. One such factor, self-compassion, has been shown to be protective against emotional distress more broadly, therefore it is a good candidate to investigate in relation to suicide risk.
Autobiographical memory biases (AM) have repeatedly been implicated in the aetiology of psychological distress, with studies consistently finding biases in overgeneral AM recall across a variety of clinical populations including those with depression and suicidality. Such biases are implicated in suicide risk because they are associated with deficits in social problem-solving. Encouragingly, some recent studies have found that psychological therapies (e.g. Mindfulness-Based Cognitive Therapy (MBCT) may reduce overgeneral AM recall. Indeed, the research literature suggests that self-compassion may act as a mechanism for change in MBCT and that it can be cultivated through meditation. As yet, little research has examined the relationship between self-compassion, correlates of suicidality and suicide risk. In this presentation, we report on two studies from of a programme of research set out to investigate these relationships.
Methods: This presentation describes findings from two related studies. In Study 1 514 participants completed the self-compassion scale alongside well-established measures of suicide risk (e.g. defeat, entrapment), protective factors (mindfulness, resilience), wellbeing and suicide history online at 2 time points (baseline and 2.5 months later). In Study 2 60 participants took part in an experimental study investigating the effect of a single session self-compassion meditation (vs a relaxation exercise) on autobiographical memory recall following a negative mood induction.
Results: In Study 1 71 (13.8%) respondents reported suicide ideation, 24 (4.7%) reported a single episode of self-harm (self-injurious behaviour irrespective of motive) and 84 (16.3%) reported repeated self-harm. Univariate and multivariate regression analyses were conducted to investigate the relationship between dimensions of self-compassion (e.g. self-kindness, isolation, self-judgement) and self-harm history. Controls (i.e., those with no history of suicidal ideation or self-harm) differed significantly from suicide ideators and those in the self-harm group on a number of the subscales. Time 1 self-compassion total scores were predictive of suicidal ideation at time 2 but not of self-harm. Relationships between risk factors for suicidality were also investigated; in the multivariate model entrapment and self-criticism emerged as significant predictors of both suicidal ideation and self-harm history.

Out of the protective factors resilience was predictive of self-harm history. A series of mediation and moderation analyses, consistent with the integrated motivational-volitional model of suicidal behaviour (O'Connor, 2011), were also conducted. In Study 2, findings indicate significant increases in levels of self-compassion pre/post meditation and suggest that a single session of compassion meditation may be useful to investigate the relationship between self-compassion and autobiographical memory.
Discussion: This research provides evidence that self-compassion is associated with self-harm and suicidal ideation and that self-compassion may act as a protective factor. However, more research is required to better understand the nature of the relationship between self-compassion and suicide risk.

UNDERSTANDING SUICIDE: CULTURE SPECIFIC STUDIES

Chair: Mary Cwik, Johns Hopkins

1. UNDERSTANDING THE FACE OF SUICIDE ON THE AFRICAN CONTINENT

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Background: For most the countries on the continent of Africa, religion is a substantial influence and heavily embedded in legal and cultural systems. The main religions across the continent are Christianity, Islam, and African Traditional Religion. Suicide, which is condemned as a sin by these major religions, is often considered taboo and dishonorable to the family. This societal response may lead to suicides going unreported or misrepresented. Further, suicide and self-harm are both considered illegal in many African countries with evidence of these behaviors carrying a punishment of jail time and a substantial monetary fine for failed attempters as well as surviving family members. Subsequently, death by suicide is often reported as "other violent death" or "accidental death," or remains unreported for fear of legal or social persecution. Thus, it is argued that the low rate of suicide presented as occurring across the continent may be a result of underreporting due to cultural factors, rather than a true indication of prevalence. Therefore it is critically important to examine reports of suicide and suicidal behavior along with the associated risk and protective factors that are present across cultures on the continent in order to enhance the understanding of suicide in Africa.
Methods: Relevant peer-reviewed articles from journal databases including PsychINFO, EBSCO, Elsevier and African Journals Online, were searched using terms related to suicide, suicidal behaviors and the names of the African countries. From this search, 350 articles were found. Using a systematic literature review, 130 articles were critically analyzed, with 48 studies meeting the inclusion criteria.
Results: This review allowed for an improved understanding of the cultural presentation of suicide, including relevant risk factors, means, and protective factors across the continent. The most common barrier to reporting emotional distress and suicidal ideation was found to be the associated cultural-religious stigma, with related legal ramifications of suicide serving as a hindrance in certain African countries.
Discussion: This presentation provides a comprehensive review of the existing literature on suicide in Africa, emphasizing risk factors influencing suicidal behavior and cultural beliefs and norms that impact reporting of suicidal behavior on the continent. An overview of protective and preventive programs currently in place will be provided, highlighting culturally applicable initiatives that have been implemented across the continent. We hope to

draw more attention to the silently rising epidemic of suicide on the African continent, and encourage further research into solutions for this problem.

2. OUTCOMES OF A COMPREHENSIVE SUICIDE PREVENTION PROGRAM FOR THE WHITE MOUNTAIN APACHE

Mary Cwik*[1], Victoria O'Keefe[2], Novalene Goklish[3]

[1]Johns Hopkins, [2]Johns Hopkins Bloomberg School of Public Health, [3]Johns Hopkins, White Mountain Apache

Background: American Indians/Alaskan Natives (AIs/ANs) are disproportionately impacted by suicide, largely concentrated in adolescents and young adult age groups (2.5 times the US all-races rate). Few prevention programs have been developed targeting suicide directly and even fewer are designed with or for AIs/ANs. The White Mountain Apache have utilized a community-based, multitiered approach beginning in 2006 to present. Universal-level interventions bring community organizations and key stakeholders together using a participatory approach to raise community awareness. Selected-level interventions consist of gatekeeper trainings, activities led by Elders, and in-school interventions. Indicated-level interventions included a brief emergency department-linked intervention for youth with a serious suicide attempt.
Methods: We examined Apache surveillance data for patterns and characteristics over time (2001-2006 vs. 2007-2012) to evaluate the impact of prevention activities. Outcomes include both changes in suicide death rates and number of suicide attempts over time.
Results: Suicide death rates decreased by 38% from 40.0 to 24.7/100,000, while national rates remained relatively stable or increased during this time (10-13/100,000). Largest decreases were seen in ages 25-34 (-60%; 95.0 to 37.9/100,000) and 20-24 (-37%; 151.9 to 96/100,000). Suicide attempts also declined over time. Alcohol use was present in more than half of all deaths and attempts. Notable, Apache women seem to be at increased risk, with 60% of females (6 of 10) who died reported to be parents.
Discussion: The initial period of rigorous community-wide, mandated surveillance (2001 to 2006) provided a baseline for their comprehensive program (2007 to present), allowing for a unique natural experiment to compare rates pre- to post-implementation. This is one of few studies to show changes in suicide deaths. The program is unique because of the accuracy, quality and depth of local data and the longevity of the prevention activities driven by community needs and public health principles.

3. SOCIAL INFLUENCES OF SUICIDE RISK AND RESILIENCY IN A SOUTHWEST AMERICAN INDIAN COMMUNITY

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[1]Louis Stokes Cleveland VA, [2]Johns Hopkins, [3]Johns Hopkins, White Mountain Apache

Background: Suicide impacts American Indian youth at disproportionately higher rates than other ethnic groups within the United States. Research has demonstrated there are unique social, cultural, and historical factors that are related to Indigenous suicide risk and resiliency. Past empirical work has found family connectedness, cultural identity and spirituality, as well as community empowerment as being negatively related to suicide in American Indian communities (Garroutte et al., 2003; Wexler & Gone, 2012). In line with these sociocultural variables, the current study investigated the social influences that may impact suicide risk and resiliency in the White Mountain Apache Tribe (WMAT). Previous research with the WMAT has resulted in a Tribal Model of Apache Youth Suicide (Tingey, Cwik, Goklish,

Larzelere-Hinton et al., 2014) composed of individual factors (e.g., negative emotion), family factors (e.g., intergenerational burden in household), community factors (e.g., difficulty seeking help), and societal factors (e.g., social network).
Methods: This study utilized a Community-Based Participatory Research (CBPR) approach in collaboration with the WMAT. Consent and recruitment of WMAT elders, young adults, and professionals was completed and data collection took place at roundtable meetings in March to May 2015. Transcribed audio from the roundtable discussions were analyzed using open-coding data analysis to identify key themes as an addition to the existing Tribal Model of Apache Youth Suicide.
Results: Results showed themes identified in the open-coding analysis mapped onto the existing model. In addition, several themes were found to impact all levels (i.e., individual, family, community, society) including loss/grief, stress, and connectedness/support. Individual-level themes uniquely included psychosocial development, self-identity/continuity, self-destructive behavior, emotion regulation/communication, and coping. Family factors included themes of economic burden, stress/abuse, communication, and love. Community factors included themes of cultural influence, belonging, loss/grief/pain, communication. Societal themes included economic development, racism, systemic/institutional oppression, spirituality, feeling lonely, and social media.
Discussion: This study demonstrates the importance of better understanding suicide at individual, family, community, and societal levels within the WMAT community. These findings are in line with past empirical research on Indigenous suicide prevention targeting each of these levels. These themes will inform Phase II and III of this research collaboration with WMAT and will culminate in the development of a theoretical model and social network intervention to address substance use and suicide risk among WMAT youth.

4. THE EFFECT OF SOCIO-ECONOMIC FACTORS ON SUICIDE RISK AMONG IMMIGRANT POPULATION IN NORWAY: A REGISTER-BASED NESTED CASE-CONTROL STUDY

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Background: The relative importance of socio-economic factors on risk for suicide in the immigrant population may differ from that for the native population; however, few studies have addressed this issue on a national basis.
Methods: With a nested case-control design using national Norwegian longitudinal registers we identified 11,409 suicide cases having occurred in the years 1992-2012 and 191,785 sex-birthdate-matched controls. The impact of socio-economic factors on the risk for completed suicide was assessed through conditional logistic regression.
Results: Among 11,409 suicides, 1,139 (10%) were individuals with immigration background, including 566 (5.0%) first-generation immigrants, 30 (0.3%) second-generation immigrants, 366 (3.2%) born in Norway with one foreign-born parent, and 177 (1.6%) born abroad with at least one Norwegian-born parent. Clearly, suicide cases, as well as the controls, with immigration background differed somehow in their socioeconomic status from those without such a background. Being single or separated, divorced or widowed, was associated with an increased risk of suicide regardless to the subjects' immigration background. Low level of education and low annual income significantly increased the risk for suicide in almost all the study subgroups with a greater effect among foreign-born subjects with at least one Norwegian-born parent. Living in the capital area was associated

with a lower risk of suicide in first-generation immigrants and a higher risk in native Norwegians.
Discussion: Persons with immigration background, as well as native Norwegians, shared most common risk factors for suicide, such as being single or separated, divorced or widowed, low level of education and low annual income, but the strength of associations between socio-economic factors and risk for suicide can differ by immigration background.

5. SUICIDAL BEHAVIOUR IN INDIGENOUS COMPARED TO NON-INDIGENOUS MALES IN URBAN AND REGIONAL AUSTRALIA: PREVALENCE DATA SUGGEST DISPARITIES INCREASE ACROSS AGE GROUPS

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Background: High rates of Indigenous suicide is a distressing phenomenon that plagues several postcolonial countries. In Australia, suicide is a leading cause of mortality for Indigenous people, and there is a particularly striking disparity in suicide rates between Indigenous and non-Indigenous males in younger cohorts that returns to parity among cohorts of middle aged males. However, much remains unknown about the prevalence of suicidal thoughts and attempts across a broad age range of Indigenous men in general community settings throughout Australia. This is the first study to be able to compare the prevalence of suicidal thoughts and attempts between Indigenous and non-Indigenous males in urban and regional Australia, and to examine the extent to which any disparity between Indigenous and non-Indigenous males varies across age groups.
Methods: We used data from the baseline wave of The Australian Longitudinal Study on Male Health (Ten to Men), a large-scale cohort study of Australian males aged 10 to 55 years residing in urban and regional areas. Indigenous identification was determined through participants self-reporting as Aboriginal, Torres Strait Islander or both. The survey collected data on suicidal thoughts in the preceding two weeks and lifetime suicide attempts.
Results: 432 participants (2.7%) identified as Indigenous and 15,425 as non-Indigenous (97.3%). Indigenous males were twice as likely as non-Indigenous males to report recent suicidal thoughts (17.6% vs 9.4%; OR=2.1, P<0.001) and more than three times as likely to report a suicide attempt in their lifetime (17.0% vs 5.1%; OR=3.6; P<0.001). The prevalence of recent suicidal thoughts did not differ between Indigenous and non-Indigenous males in younger age groups, but a significant gap emerged among men aged 30 to 39 years and was largest among men aged 40 to 55 years. Similarly, the prevalence of lifetime suicide attempts did not differ between Indigenous and non-Indigenous males in the 14 to 17 years age group, but a disparity emerged in the 18 to 24 years age group and was even larger among males aged 25 years and older.
Discussion: Our paper presents unique data on suicidal thoughts and attempts among a broad age range of Indigenous and non-Indigenous males. We found that, in urban and regional Australia, the prevalence of recent suicidal thoughts and having ever attempted suicide was substantially higher among Indigenous males compared to non-Indigenous males. The disparity in the prevalence of suicidal thoughts increased across age groups. This trend is curiously different from the age pattern for the ratio of the Indigenous suicide rate compared to the non-Indigenous suicide rate, where there is a high level of disparity observed in younger age cohorts which then trends towards parity among middle-aged males. There is a clear imperative to devote resources and further research to the area of Indigenous suicide prevention, with a view to increasing the availability of culturally appropriate and holistic suicide prevention supports that target Indigenous males of all ages.

6. IDENTIFYING SPACE-TIME SUICIDE CLUSTERS IN HONG KONG AND TAIPEI CITY, TAIWAN

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Background: Clusters of suicidal behaviors that occur close to each other in time and space cause a concern of further 'contagion' of suicidal behavior in the community. However, suicide clusters are under-researched and has been described as an 'undiscovered country' (Lancet 2011;378:1452). Few studies have examined suicide clusters using robust statistical approaches. Moreover, previous research based on exact residential locations is rare.
Methods: Suicide data for Hong Kong (2005-2010) were extracted from Coroner's files and data for suicide and possible suicide (i.e. undetermined death, accidental suffocation, and accidental pesticide poisoning) in Taipei City, Taiwan (2004-2010) were from the Taiwan cause-of-death data files. Exact residential location was extracted and geocoded. We performed two sets of spatial-temporal analysis to detect clusters of suicide aged 10 or over using the software package SaTscan which uses a spatial-temporal scan approach to identify concentration of events across time and space: i) a Space-Time Permutation modelling analysis based on the day of suicide and residential address, and ii) a discrete Poisson modelling analysis based on the month of suicide and residential district (a small area unit with a mean population of 3900 for Hong Kong and 5800 for Taipei City). Subgroup analyses were conducted for four age groups aged 10-24, 25-44, 45-64, and 65+ years, respectively. A range of maximal cluster sizes in space (1%, 5%, 10%, and 50% of the total area) and time (1, 3, and 6 months) were used to test the robustness of findings.
Results: Complete residential information was extracted for 5613 suicides in Hong Kong and 2587 suicides and possible suicides in Taipei City. In Hong Kong, one suicide cluster of 3-4 deaths in the group aged 10-24 was identified by both Permutation and Poisson models and one additional cluster of 4-5 deaths aged 25-44 was identified by Poisson model. In Taipei City, there was some evidence for a suicide cluster of 3 deaths aged 10-24 and less consistent evidence for another cluster of 8 deaths aged 25-44 in the Permutation modelling analysis only.
Discussion: Suicide clusters with statistical evidence were rare (0.2-0.5% of all suicides) in the two cities studied. They tended to occur in young people (0.9-2.4% in 10-24-year-olds and 0.3-1.0% in 25-44-year-olds). The choice of models and cluster size parameters impacted on the results. Media may have a role in one cluster occurring in Hong Kong. Future research should examine clusters of suicidal behavior using data for suicide deaths and suicide attempts combined and proximity of suicidal behaviors beyond the geographical dimension.

Tuesday, November 7, 2017

RISK FACTORS FOR SUICIDE

Chair: Annette Erlangsen, Danish Research Institute for Suicide Prevention

1. NEUROLOGICAL DISORDERS AND RISK OF SUICIDE

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Background: Neurological disorders have been linked to elevated risks of psychiatric comorbidity, particularly depression. It has, furthermore, been suggest that the chronic course of certain neurological disorders might be linked to an elevated risk of suicide. Yet, we have little knowledge to base interventive efforts on.
AIM: to examine whether people with neurological disorders have higher rates of suicide than people without neurological disorders.
Methods: Nationwide register data on all persons aged 15+ years who were living in Denmark during Jan 1st 1980 through Dec 31st 2014 (N= 7,454,921) were obtained. Neurological disorders were identified through hospital diagnoses. Rate ratios of suicide were obtained using logistic regression models while adjusting for period, gender, age group, civil status, income level, physical co-morbidity, history of mental disorders, and history of suicidal behavior.
Results: A total of 34,529 suicides were observed over the 35 year follow-up. Several neurological disorders were linked to higher suicide rates than observed for those without the disorder, including: central nervous system infections (OR: 1.6 CI-95: 1.3-1-9); meningitis (OR: 1.5 CI-95: 1.1-1-9); encephalitis (OR: 1.6 CI-95: 1.2-2.1); Huntington's disease (OR: 4.9 CI-95: 3.1-7.9); amyotrophic lateral sclerosis (OR: 5.3 CI-95: 3.8-7.6); Parkinson's disease (OR: 1.7 CI-95: 1.4-1.9); epilepsy (OR: 1.6 CI-95: 1.5-1.7); stroke (OR: 1.2 CI-95: 1.1-1.3). Interestingly, dementia was linked to a lower frequency (OR: 0.8 CI-95: 0.7-0.9). Further analysis by number of hospitalizations/bed days indicated a dose-response relationship between frequent/long-term hospitalizations and death by suicide.
Discussion: The findings from this study provide support for a link between various neurological disorders and death by suicide. Screening for depression during hospital contacts for neurological disorders ought to be considered as an intervention strategy.

2. TRAUMATIC BRAIN INJURY AND RISK OF SUICIDE: A NATIONWIDE DANISH STUDY

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[1]Copenhagen Mental Health Center, [2]Danish Research Institute for Suicide Prevention

Background: Traumatic brain injury (TBI) has previously been linked to psychiatric disorders and suicidal behavior. However, large-scale studies have been lacking on the risk of suicide in people with TBI including investigations of the type of TBI, dose-response and

temporal effects with comprehensive confounder control of amongst other accident proneness.
Methods: We utilized the Danish nationwide registers, identifying a cohort of 7,418,390 individuals aged 10 years and older accounting for 164,265,743 million person-years of follow-up during 1980 through 2014. Data were analyzed using Poisson regression analysis and were adjusted for age, sex, calendar year, socio-economic status, fractures not involving the skull (indicator for accident proneness), and somatic comorbidity.
Results: A total of 565,702 individuals (7.6%) were identified with TBI during the study period, of which 3,794 individuals died by suicide. TBI was associated with an increased risk of suicide with an incidence rate ratio (IRR) of 2.1 (95%CI: 1.9-2.1). A mild TBI was linked to an IRR of 1.9 (95%CI: 1.8-2.0), severe TBI with an IRR of 2.9 (95%CI: 2.7-3.1), and skull fracture with an IRR of 2.2 (95%CI: 1.9-2.5). When excluding individuals with a history of psychiatric diagnosis or suicide attempt the risk was still elevated. Fractures not involving the skull also increased suicide risk, however the effect of TBI was significantly greater than these fractures ($p< 0.0001$). The risk of suicide increased with the number of TBI admissions in a dose-response relationship and the risk was highest during the first 6 month following the TBI incident (IRR=7.8 (95%CI: 7.3-8.5)).
Discussion: In this largest study to date we show that TBI is associated with an increased risk of suicide in a dose-response and temporal manner. The association could be due to the traumatic brain affection resulting in detrimental neuroinflammatory mechanisms causing poor psychosocial functioning and psychiatric symptoms.

3. MILD TRAUMATIC BRAIN INJURY AND RISK OF SUICIDE: A CHRONIC EFFECTS OF NEUROTRAUMA CONSORTIUM STUDY

Amy Byers*[1], Yixia Li[2], Deborah Barnes[1], Karen Seal[1], W. John Boscardin[1], Kristine Yaffe[1]

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Background: Although evidence shows that members of the military and Veterans are at increased risk of suicide and traumatic brain injury (TBI), little is known about the relationship of TBI with risk of death by suicide among Veterans. Moreover, even less is known about whether less severe TBI spectrum diagnoses such as mild TBI (mTBI), as well as moderate/severe TBI, are associated with risk of suicide. Our objective was to determine the association between TBI and risk of death by suicide in Veterans from all eras, and determine whether the association differs by severity of TBI. Moreover, we hypothesized that death by suicide was attributed to TBI above and beyond major medical conditions and psychiatric disorders, as well as accounting for the competing risk of death by other means.
Methods: We conducted a retrospective cohort study of 1.5 million Veterans aged 18 years and older (mean age (SD)=59.6 (17.3) years and 9% women) from the Department of Veterans Affairs (VA) National Patient Care Database (NPCD). Analyses included all patients with TBI (n=241,433) from fiscal year 2002 – December 31, 2014 plus a 2% random sample of patients without TBI (n=1,286,613). TBI was identified through the Comprehensive Traumatic Brain Injury Evaluation database and the VA NPCD with severity defined as mild or moderate/severe using Department of Defense or Defense and Veterans Brain Injury Center 2012 criteria. Completed suicides were determined using the Veteran Suicide Archive data, which comprises multiple integrated sources of cause-specific death data, including data collected directly from states (i.e., state mortality files) and the Center for Disease Control and Prevention National Death Index. Comorbid conditions were determined using International Classification of Diseases 9th edition (ICD-9) codes. Fine-Gray proportional hazards regression was used to examine time to suicide as a function of

TBI severity with age as the time scale while accounting for the competing risk of other deaths, and adjusting for demographics and comorbidities.
Results: Of those with TBI, the majority (54%) had mild TBI. The unadjusted incidence of death by suicide was 0.21% (n=2,694) in Veterans with no TBI diagnosis, while in those with mTBI it was 0.25% (n=324) and in Veterans with moderate/severe TBI it was 0.34% (n=374). The mean age (SD) of suicide was 63.9 (15.9) for those with no TBI, 46.2 (17.6) for Veterans with mTBI, and 50.0 (16.0) years for those with moderate/severe TBI. The average (SD) follow up time for Veterans with no TBI, mTBI, and moderate/severe TBI was 5.0 (3.7), 3.5 (2.8), and 4.3 (3.3) years, respectively, with a range of 0-13.3 years. In Fine-Gray proportional hazards analyses, including demographics and medical comorbidities, and accounting for the competing risk of other deaths, Veterans with mTBI had a nearly 40% increased risk of suicide compared with those with no TBI (hazard ratio [HR]: 1.37, 95% confidence interval [CI]: 1.20-1.56), while Veterans with moderate/severe TBI had an over 60% increased risk of suicide (HR: 1.63, 95% CI: 1.45-1.84). The addition of psychiatric comorbidities to the fully-adjusted model only slightly attenuated the hazard ratios.
Discussion: Findings suggest that adults who have experienced a mild TBI, as well as those who have experienced a moderate/severe TBI, need to be monitored closely for suicide risk, independent of psychiatric comorbidity. Future studies should determine whether treatment of TBI spectrum disorders may prevent suicide.

4. SOCIAL-COGNITIVE RISK FOR SUICIDE: FALSE PERCEPTION OR SELF-FULFILLING PROPHECY?

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Background: The Interpersonal Theory of Suicide (Joiner, 2005) suggests perceptions of burdensomeness (PB) and feelings of thwarted belongingness (TB) predict risk for suicidality. Although research supports this hypothesis, these social-cognitive risk factors have only been explored within the context of established relationships (e.g., friends and family). Little else is known about how individuals at risk for suicide may approach forming new relationships. It could be that PB and TB may negatively impact these initial interactions and inhibit the formation of new potential social supports. The current study examined the impact of PB and TB during real-time interactions with strangers.
Methods: Participants (N = 272, M age = 18.7) completed measures of socioemotional adjustment before participating in a self-disclosure task with a same-sex stranger (Aron, 1997). Subsequently, participants (referred to as target) reported impressions of their partner every 15 minutes during the 45-minute task.
Results: Results indicated that high levels of PB and TB accurately identified participants at risk for suicide as assessed by the Suicidal Behaviors Questionnaire (SBQ-R; Osman et al., 2001). In a series of structural equation models, PB and TB predicted participants' experiences during the interaction.
The first model compared how the target thought the partner felt about the interaction with how the partner actually felt ($\chi 2(2) = .19$, $p = .58$; TLI =1.03, CFI = 1.00, RMSEA = .00). Target's TB predicted thinking the partner did not want to be friends via believing the partner did not want to keep talking (b = -.02, p = .00) and did not like them (b = .-.02, $p < .001$). However, TB had no effect on partner's actual willingness to talk, levels of liking, or desire to be friends.
The second model compared the target's impressions of the partner with the partner's impressions of the target. In this model ($\chi 2(2) = .19$, $p = .91$; TLI = 1.05, CFI = 1.00,

RMSEA = .00), target's TB predicted less desire for friendship via decreased willingness to keep talking (b = -.24, p < .001) and less liking of partner (b = -.01, p = .01). TB had no effect on partner's willingness to talk, liking of target, or desire to be friends. Interestingly, TB impacted partner's desire for friendship via target's liking of partner, suggesting that partners may infer target's negative appraisal of them.
The third model examined how target's impressions of partner's desires affects their own desire for friendship ($\chi 2(2) = .19$, p = .56; TLI =1.03, CFI = 1.00, RMSEA = .00). Target's TB predicted decreased desire for friendship via thinking that the partner did not desire to keep talking (b = -.02, p = .00) and that their partner did not like them (b = -.02, p < .001). TB predicted partners' belief that target did not want to be friends via target's belief that they were disliked, again suggesting that the partner may be impacted by target's erroneous appraisals. PB did not impact target's or partner's perceptions of the interaction or desire to be friends.
Discussion: Results indicate that social-cognitive risk factors, specifically TB may negatively impact the potential for new relationship formation in individuals at risk for suicide, which could be a crucial point of intervention. Participants with high levels of TB were more likely to believe their partners did not want to talk, did not like them, and did not want to be friends, despite their partners not feeling this way. This negatively impacted their own desires for friendship as well as their partner's desires for friendship, suggesting that social-cognitive risk factors may be both false perceptions and a self-fulfilling prophecy. Results add to understanding of how social-cognitive risk may contribute to increased social alienation and, therefore, increased suicide risk.

5. SUICIDE RISK ASSESSMENT IN PATIENTS WITH PSYCHOSIS UNDER SECONDARY MENTAL HEALTHCARE: ARE WE EVALUATING THE RIGHT FACTORS?

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Background: Suicide is the largest single cause of excess mortality in schizophrenia, particularly in early stages of the psychotic illness. However, concerns have been voiced about the futility of risk assessment in schizophrenia and suicide risk assessment in schizophrenia remains under-utilized.
We compared risk assessment factors between suicide completers with/without schizophrenia spectrum disorders (SSD) (Study 1) receiving secondary mental healthcare from the South London and Maudsley NHS Foundation Trust (SLaM) and we also investigated the role of these factors in predicting suicide completion in patients with SSD (Study 2).
Methods: Sample: The sample comes from the SLaM Biomedical Research Centre (BRC) Case Register (CRIS), which is linked with national mortality data. Those patients with a primary ICD-10 diagnosis of SSD (F2 codes) over 2007-2013 who took their lives before 31st December 2013 were compared with i) those non-SSD who died from suicide within the study period (Study 1) and ii) a control group of SSD patients who did not end their lives (Study 2).
Measures: Age, gender, ethnicity and marital and employment status and social deprivation were analysed as covariates.
The SLaM suicide risk assessment is a 15-item structured assessment taking the form of present/absent tick-boxes and enquiring about widely recognised risk factors such as previous

history of suicide attempts, suicidal ideation and hopelessness. The most recent full risk assessment was considered.
Statistics: Binary logistic regression models investigated the individual contribution of each independent variable to the model (ORs, 95%CIs).
Results: Study 1:Most of the classic suicide risk factors were more frequent in the non-SSD group than in SSD patients (reference), particularly, suicidal ideation (57.1% vs. 21%, OR=0.2, 0.05-0.81, p=0.03), hopelessness (66.6% vs. 21%, OR=0.13, 0.03-0.55, p<0.01), lack of control of life (52.4% vs. 21%, OR=0.24, 0.06-0.98, p=0.04), impulsivity (61.9% vs. 26.3%, OR+0.22, 0.06-0.84, p=0.03) and significant loss (61.9% vs. 26.3%, OR=0.22, 0.06-0.84, p=0.03).
Study 2: Cases were younger at first contact (34.5 ± 12.6 vs. 39.2 ± 15.2) than controls and there was a higher preponderance of males than females (OR=2.07, 1.18-3.65, p=0.01). Five risk assessment factors were significantly associated with suicide completion, namely previous suicide attempts (OR=4.42, 2.01-9.65, p<0.01), suicidal ideation (OR=3.57, 1.40-9.07, p=0.01), previous use of violent method (OR=3.37, 1.47-7.74, p<0.01) and recent hospital discharge (OR=2.71, 1.17-6.28, p=0.04). Although age at first contact (OR=0.94, 0.90-0.98, p<0.01), previous suicide attempts (OR=4.07, 1.80-9.18, p<0.01) and suicidal ideation (OR=3.06, 1.14-8.20, p=0.03) survived the multivariable regression model, this model particularly classified correctly controls (98.6%) rather than cases (3.2%).
Discussion: The classic risk factors evaluated by the risk assessment tool were significantly more common in non-SSD patients who took their lives than in suicide completers with SSD (Study 1).
Older age at first contact with mental health services and lack of both suicidal history and suicidal ideation were useful protective markers indicative of those less likely to end their own lives, i.e. the model identified controls rather than cases (Study 2).
Hence, the classic suicide risk assessment model seems to be of little relevance for patients with SSD.

6. CONTACT WITH MENTAL HEALTH SERVICES PRIOR TO SUICIDE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Suicide is an important public health issue that has received a lot of attention, yet the suicide rates remain quite stable internationally and have even been increasing considerably, particularly in the U.S. Individuals suffering from mental disorders are an especially high-risk group. Central health agencies including WHO, Institute of Health Care and Surgeon General all emphasizes access to health services as a key mean to prevent suicide. To our knowledge, this is the first meta-analysis of contact with various mental health services at different time points prior to suicide.
Methods: We searched MEDLINE and PSYCINFO with the keyword suicide combined with inpatient, outpatient, mental health services, hospitalization and patient discharge from 2000 until 2017. Literature lists of included studies were also screened. Records reporting the prevalence of contact with different types of services prior to suicide in the general population were included in the review. Full-text screening, data extraction, and risk of bias assessment were conducted by two independent reviewers. A random effects meta-analysis with double Arcsine transformation stratified by setting was conducted on the proportion of suicides during inpatient care and on the proportion in contact with services within 1 year

preceding suicide. Random-effects meta-regression was used to examine subgroup differences on gender and sample year.
Results: 34 studies were included in the systematic review, and 19 studies in the meta-analysis. The overall prevalence of patients dying by suicide while admitted to a psychiatric hospital was 3.6 % [2.6 – 4.8 %]. There were significant differences (p = 0.02) in the prevalence of contact within 1 year between inpatient services (18.1 % [14.2 – 22.4 %]), outpatient services (22.8 % [13.3 – 34.0 %]), and mental health services (25.8 [22.7 – 29 %]). Heterogeneity was large (I2 = > 98 %) in all strata. Significant differences (p = > 0.01) in prevalence of contact were found between males (18.8% [16.3 – 21.4 %]) and females (30.8 % [28.3 – 33.5 %]) in the meta-regression analysis. Sample year was a significant covariable for mental health services (p = .003), but not for patients currently admitted (p = .65) or hospitalized within the last year (p = .68).
Discussion: In the year preceding their death, a considerable percentage of the suicide descendants were in contact with some form of mental health service. Compared to previous non meta-analytic reviews, we found a lower overall prevalence of contact in the current meta-analysis. There were significant differences in health care utilization between the genders. Another significant finding was the increasing prevalence of contact with mental health services according to sample year - but this trend was not found in the inpatient setting. The long-lasting transformation of the health care systems, with a downsizing of inpatient facilities and increased prioritization of outpatient- and community services, may explain this latter finding. Possible limitations of the current review include the large degree of heterogeneity and the exclusion of specific diagnostic and occupational groups. An overall problem is that the literature in this area is scarce and that the outcome is reported inconsistently across studies.
Based on the small number of primary studies identified in this review, it is clear that more research should be conducted on patients currently receiving treatment - in diverse health care systems and in a wider number of countries and regions. The findings could contribute to the development of measures that may help services reach out to more individuals, which is essential if we want suicide prevention in this population to be effective.

NEUROBIOLOGY OF SUICIDE: GENETICS & GENOMICS

Chair: Gustavo Turecki, McGill University

1. POSITIVE ASSOCIATION BETWEEN TOXOPLASMA GONDII IG SEROINTENSITY AND HOPELESSNESS IN THE OLD ORDER AMISH

Teodor Postolache*[1], Aline Dagdag[1], Abhishek Wadhawan[1], Kathy Ryan[1], Xiaoqing Peng[1], Sonia Y Postolache[1], Iqra Mohyuddin[1], Melanie Daue[1], Gursharon Nijaar[1], Maureen Groer[2]

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Background: Toxoplasma gondii (T.gondii) IgG positivity and serointensity, and markers of low-grade inflammation, have been previously associated with suicidal self-directed violence (SSDV). Although associations with unipolar depression have also been investigated, results have been inconsistent, possibly as a consequence of high heterogeneity of clinical samples. Thus, we now studied in a more homogeneous population, (i.e. Amish) with high T.gondii seroprevalence, associations between markers of T.gondii infection and dysphoria-hopelessness and anhedonia scores on depression screening questionnaires. Among symptoms of depression, hopelessness has the strongest evidence of triggering suicidal behavior, and also represents a treatment target for cognitive-behavioral interventions.

Methods: In 306 Old Order Amish, age range 18-87(median 44), with 191 (62.4%) women, all participants in the Amish Wellness Program in Lancaster, PA, we had obtained both T.gondii IgG-titers and neopterin levels (by ELISA), and depression screening questionnaires (current and life-long PHQ9 N=280 and PHQ2 N=26). Current and life-long anhedonia, dysphoria-hopelessness, and combined depression phenotypes were analyzed in relationship to logtransformed-titers, seropositivity, and logtransformed-neopterin with linear models with adjustment for age and sex.
Results: Serointensity was significantly associated with current dysphoria-hopelessness (p=0.045) and combined anhedonia and dysphoria-hopelessness (0.040), while associations with simple anhedonia scores, life-long depression phenotypes, were not significant. There was also a marginal trend for associations between seropositivity and current dysphoria-hopelessness (p=0.057) and their combination (p-0.055). Logneopterin- associations with any depression phenotype were not significant.
Discussion: Hopelessness is a new suicide risk elevating dimension associated with T. gondii infection. The lack of anhedonia effect may be secondary to dopamine producing by the parasite. Inflammation is unlikely to be the mediator of this associations. These results should lead to larger longitudinal studies that could test if hopelessness-dysphoria is associated IgG-titers elevations, possibly secondary to T.gondii reactivation, and to interventional studies to test if reducing T.gondii reactivation may improve management of suicide risk. Host and parasite genetic interplay as well as environmental risk factors for infection are immediate goals of our investigation

2. SIGNIFICANT DIFFERENCES IN VARIANTS IN THE OPIOID RECEPTOR MU-1 GENE OPRM1 IN UTAH SUICIDES

Maxton Muir*[1], Elliott Ferris[1], Marcos Barbero[2], Todd Darlington[2], Danli Chen[2], Leslie Jerominski[2], Brandon Callor[3], Erik Christensen[3], Douglas Gray[3], Hilary Coon[1]

[1]University of Utah School of Medicine, [2]University of Utah, [3]Utah State Office of the Medical Examiner, Utah Department of Health

Background: Suicide is a pressing social issue in the United States, claiming over 44,000 lives per year. The Rocky Mountain States have the highest age adjusted suicide rates in the nation, and Utah ranks fifth. Our Laboratory, in partnership with the State of Utah Office of the Medical Examiner have created the Utah Suicide Genetics Project. We are working to identify genetic causes of suicide and to increase understanding of the neurobiology of suicide. The overall heritability of suicidal risk factors has been experimentally supported by multiple studies. In 1995, Gabilondo and colleagues found an increased density of opioid receptors in certain brain regions of suicide victims, suggesting that there may be a link between opioid receptor variation and suicidal behavior. Additionally, substance abuse is one of the major risk factors for suicide, with 20% of suicide decedents testing positive for opiates. It may be that variations in the opioid system plays a role in the etiology of suicide by modulating individuals' response to pain and stress. Identifying genetic causes to suicide may lead to improved clinical prevention of suicide through knowledge of specific mechanisms.
Methods: The aim of this study was to investigate variation of the Opioid Receptor Mu-1 gene (OPRM1) in a sample of over 1300 suicide victims from Utah. With permission from the University of Utah and Utah State Health Department Institutional Review Boards, blood for DNA was collected from each suicide decedent. DNA was extracted from blood samples using standard techniques. Genotyping of these DNA samples was carried out using: 1) Illumina Infinium Psycharray genotyping platform, an array that includes 250,000 variants

across the genome and an additional 50,000 sites relevant to psychiatric conditions; 2) Illumina Infinium HumanExome array which includes 240,000 putative functional markers extracted from whole exome and whole genome sequencing studies. SNPs within the regulatory, coding, and intronic sequence of OPRM1 were extracted. Ten SNPs with at least two alternate alleles in suicide cases and with pairwise linkage disequilibrium < 0.8 were retained. Allele frequencies in suicide cases were compared to data from the Exome Aggregation Consortium and 1000 Genomes Project's International Genome Sample Resource through the Single Nucleotide Polymorphism Database (dbSNP). Bonferroni adjusted P-values for each allele was calculated using chi-square with Yates' correction.
Results: Several rare SNPs of OPRM1 were present in the Utah suicide population with statistically significant frequencies. These variants: rs1799971 (P=.0017), rs540825 (P=.0009), rs675026 (P=.002), rs17174801 (P=.00001) may play a role in risk for suicide.
Discussion: Importantly, our study replicates a previous report implicating lower frequency of the alternate allele at rs1799971 and risk of suicide. There is evidence that rs1799971 is linked to increased analgesic opioid consumption but higher reported pain levels. It is possible that the absence of the alternate allele at rs1799971 removes a protective effect against suicidal actions present in the normal population. Consequences of the other significant SNPs found in our sample will be investigated. In addition, cases driving significant results will be described fully using all available demographic and electronic medical record data.

3. TARGETED SEQUENCING AND FUNCTIONAL ASSESSMENT OF THE 2P25 REGION IN SUICIDE ATTEMPTERS WITH BIPOLAR DISORDER

Sophia Gaynor*[1], Marie Gaine[1], Eric Monson[1], Kelly de Klerk[1], Meredith Parsons[1], Lalita Oonthonpan[1], Eric Taylor[1], Peter Zandi[2], James Potash[1], Virginia Willour[1]

[1]University of Iowa, [2]Johns Hopkins University

Background: Our lab previously conducted a genome-wide association study (GWAS) of the attempted suicide phenotype. The GWAS implicated common variation in the 2p25 region (p = 5.07 x 10-8). The most significant variants in the 2p25 region localized to an intergenic and putative regulatory region. The goal of the current study was to identify and functionally characterize both common and rare variation in the 2p25 region to better understand the role of this region in the attempted suicide phenotype.
Methods: We conducted a targeted next-generation sequencing study of the entire 2p25 region (350 kb total) in 476 bipolar suicide attempters and 473 bipolar non-attempters. We performed individual-variant tests, gene-level tests, and haplotype analyses on this sequencing data. We then used the CRISPR-Cas9 gene editing system followed by RNA-sequencing in HEK293 cells to identify potential regulatory elements within regions implicated by our sequencing results.
Results: Our sequencing effort allowed us to narrow the associated region from 350 kb to 80 kb based on a clustering of our top variants within an intergenic 80 kb linkage disequilibrium (LD) block in 2p25. The top results from the current study also localized with our best variants from the attempted suicide GWAS. To determine the regulatory potential of our region, we identified and deleted the most promising 10 kb segment (chr2:103,500 to chr2:113,500) of our 80 kb LD block in HEK293 cell lines using CRISPR-Cas9. Deletion of this segment significantly altered the expression of 37 genes across the genome, including genes involved in apoptosis and DNA structure.
Discussion: We identified an 80 kb intergenic region on chromosome 2 that is implicated in attempted suicide in both our past GWAS and the current targeted sequencing study. This

region likely has regulatory potential, as deletion of a segment of it causes targeted changes in gene expression. These implicated genes and pathways should be investigated as potential candidates for the biological basis of suicidal behavior.

4. ANALYSIS OF DRUG TARGET GENE SEQUENCE VARIANTS WITH SUICIDAL BEHAVIOUR SEVERITY IN BIPOLAR DISORDER PATIENTS

Clement Zai*[1], Arun Tiwari[1], Vincenzo de Luca[1], Sajid Shaikh[1], Nicole Braganza[1], John Strauss[1], James Kennedy[1], John Vincent[1]

[1]Centre for Addiction and Mental Health

Background: A number of potential candidate genes have emerged from recent genome-wide association studies of suicide attempt in bipolar disorder. However, main findings from these studies of common DNA variants need further validation before their roles can be confirmed. Focused investigation of genes encoding pharmacotherapeutic targets may lead to drug repurposing for the treatment and/or prevention of suicide.
Methods: Across 197 drug target genes, we analyzed 2469 DNA variants in our sample of bipolar disorders patients of European ancestry (N=227). We tested for possible association between these variants and suicidal behaviour severity scores from the Schedule for Clinical Assessment in Neuropsychiatry using PLINK for individual variants and GRANVIL for entire genes.
Results: A number of DNA variants in the Transforming Growth Factor Beta Receptor 1 gene TGFBR1 were nominally associated with suicidal behaviour severity scores ($p<0.005$). The gene-based tests using GRANVIL also indicated an association between TGFBR1 and suicidal behaviour severity ($p=0.0001$). However, these findings were not replicated in an independent sample of bipolar disorder patients of European ancestry. Of the top individual variants, ITGB1 rs2230396 was found to be nominally associated in an independent bipolar disorder sample.
Discussion: We did not find any statistically significant association between DNA sequences of 197 drug target genes and suicidal behaviour severity. Additional studies are required to strengthen our preliminary findings with the ITGB1 gene.

5. SHARED GENOMIC SEGMENTS ANALYSIS IN EXTENDED PEDIGREES AT HIGH RISK OF SUICIDE AND ASTHMA

Todd Darlington*[1], Nancy William[1], Megan Puzia[1], Brooks Keeshin[1], Sheila Crowell[1], Amanda Bakian[1], Dale Cannon[1], Brandon Callor[2], Tracii Haynes[1], Danli Chen[1], Elliott Ferris[1], Nicola Camp[1], Hilary Coon[1]

[1]University of Utah, [2]Utah State Office of the Medical Examiner, Utah Department of Health

Background: Suicide is the 10th leading cause of death in the US, and Utah consistently has one of the highest rates. Like many complex disorders, there is a genetic component to the etiology of suicide, with heritability estimated at ~45%. Identifying genetic variants for suicide risk remains a challenge due to genetic heterogeneity and complex inheritance patterns. To reduce heterogeneity, first we use a pedigree-based approach (related individuals are more homogenous). Second, asthmatics have higher rates of suicide than non-asthmatics, although only a small fraction die by suicide. In examining pedigrees with high familial risk of asthma and suicide, it is likely that heterogeneity is further reduced by focusing on this specific subtype of suicide. Understanding the genetic factors involved is important for development of future prevention and treatment interventions.

Methods: In collaboration with the Utah Office of the Medical Examiner, >4000 DNA samples from suicide decedents have been collected since 1996, and more than 700 have been genotyped (Illumina PsychArray). Decedents were linked to genealogical, demographic, and medical data (including ICD diagnostic codes) in the Utah Population Database (UPDB). The UPDB identified extended pedigrees at high risk (HR) for suicide using the Familial Standardized Incidence Ratio (FSIR, ratio of observed to expected based on pedigree size, cohort and sex and age distributions), then determined asthma FSIRs in the identified pedigrees. Dense genotyping data combined with large extended pedigrees presents a non-trivial analysis. Therefore, we developed a strategy based on the Shared Genomic Segment (SGS) method to identify likely-inherited chromosomal segments, which accounts for multiple testing by optimizing over all possible (or specified) subsets of decedents in a HR pedigree. We applied the SGS strategy to two HR suicide pedigrees also with HR of asthma. In addition to high rates of suicide and asthma, each pedigree included two suicide decedents with asthma diagnoses. In each pedigree, the included subsets were limited to those containing both decedents with asthma diagnoses.
Results: We identified two HR pedigrees for both suicide and asthma, with two asthma/suicide decedents each; pedigrees "129334" and "265545" (7 and 4 decedents with DNA, respectively). FSIRs were 2.75 and 1.71 (suicide and asthma, ped 129334), and 4.05 and 2.34 (suicide and asthma, ped 265545). All FSIRs were significant at $p < 1e\text{-}6$. SGS analysis identified several regions with genome-wide suggestive evidence of being identical by descent. In ped 129334, there were 5 regions (18p11.22, 18p11.32-18p11.31, 10q21.1, 14q32.31, and 4q22.1) with empirical p-values < 2.54e-6. In ped 265545, there were 7 regions (4q32.3, 20q13.33, 1q32.3, 10q23.33, 1q23.1, 2q14.1, 4p16.3-4p16.2, and 3p14.1) with p-values < 1.28e-4.
Discussion: Through analysis of HR suicide pedigrees with HR of asthma, we attempted to reduce the genetic heterogeneity and identify regions harboring genetic risk for this particular subtype of suicide. We identified shared regions in both pedigrees with evidence of inheritance from a common ancestor and containing potential genes of interest. In ped 129334, NAPG on 18p11.22 has been associated with bipolar disorder and been shown to regulate the expression of TNF-alpha, a pro-inflammatory cytokine implicated in asthma. In ped 265545, DPP10 on 2q14.1 has been associated with asthma. Interestingly, DPP10 is primarily expressed in the lungs and brain. This strategy has been successful in targeting our search for genetic risk. Future studies will focus on specific variant identification through re-sequencing shared segments.

6. PRECISION MEDICINE FOR SUICIDALITY: FROM UNIVERSALITY TO SUBTYPES AND PERSONALIZATION

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Background: Objective and quantitative markers would permit better and more precise assessment, tracking, and prediction of suicidal risk, which would enable preventive therapeutic interventions. Previous work by our group has identified blood biomarkers and phenotypic predictors for suicide risk in men, and separately in women, showing some gender similarities as well as differences. An essential question remained to be answered, of high relevance for developing this area of research and carrying it to full clinical applicability: would a quest for more universal predictors or a quest for more personalized predictors be more productive? We endeavored to answer this question through our current work.

Methods: First, we sought to investigate whether blood gene expression biomarkers can be identified that are more universal in nature, working across psychiatric diagnoses and genders, starting with a powerful longitudinal within-participant design, and using larger cohorts than in previous studies. Second, we identified subtypes of suicidality based on mental state (anxiety, mood, psychosis) at the time of high suicidal ideation. Third, we used a more personalized approach, by gender and diagnosis, with a focus on the highest clinical risk group, male bipolars. We examined the ability of the universal candidate biomarkers to predict suicidal ideation and future hospitalizations for suicidality, in completely independent cohorts. We also used the lists of top biomarkers we identified as a window into the biology of suicidality, by conducting biological pathways and network analyses, and by looking at co-morbidity with other disorders that may predispose or create a vulnerability to suicidality. Additionally, we leveraged these lists for therapeutics and drug discovery purposes, to see if some of the biomarkers we identified are modulated by existing compounds used to treat suicidality, and also to conduct bioinformatics drug repurposing analyses to discover new drugs and natural compounds that may be useful for treating suicidality. Finally, we integrated the totality of evidence we have generated in this study and available in the literature to date, to prioritize biomarkers for future clinical studies in the field.
Results: We were successful in this endeavor, using a comprehensive stepwise approach, leading to a wealth of findings. Step 1, 2 and 3 were discovery, prioritization, and validation for tracking suicidality, resulting in a top dozen list of candidate biomarkers comprising the top biomarkers from each step, as well as a larger list of 148 candidate biomarkers that survived Bonferroni correction in the validation step. Step 4 was testing the top dozen list and Bonferroni biomarker list for predictive ability for suicidal ideation and for future hospitalizations for suicidality in independent cohorts, leading to the identification of completely novel predictive biomarkers, as well as reinforcement of ours and others previous findings in the field.
Discussion: The biomarkers we identified also provide a window towards understanding the biology of suicide, implicating biological pathways related to neurogenesis, programmed cell death, and insulin signaling from the universal biomarkers, as well as mTOR signaling from the male bipolar biomarkers. Finally, based on the totality of our data and of the evidence in the field to date, a convergent functional evidence score prioritizing biomarkers that have all around evidence (track suicidality, predict it, are reflective of biological predisposition, and are potential drug targets) brings to the fore genes that suggest an inflammatory/accelerated aging component, which may be a targetable common denominator.

SUICIDE IN ADOLESCENTS: AGE CHALLENGES

Chair: Steven Stack, Wayne State University

1. IDENTIFICATION OF AT-RISK PRE-ADOLESCENTS THROUGH SUICIDE SCREENING IN PEDIATRIC EMERGENCY DEPARTMENTS

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Background: Suicide is the second leading cause of death among youth ages 10 to 24 years, accounting for 5,504 deaths in this age group (2014). While limited research on pre-adolescent suicide exists, some research indicates that an at-risk subset of children ages 11 and younger have suicidal ideations and behaviors. However, there is a gap in knowledge about the value of suicide screening in children younger than 10.

Methods: To improve identification of suicidal youth in the Emergency Department (ED) setting, the ASQ (Ask Suicide-Screening Questions) screen was implemented as routine care in the Johns Hopkins Hospital (JHH) Pediatric ED in March 2013 and at University of Maryland Medical Center (UMMC) Pediatric ED in July 2015. Data on a retrospective cohort of patients between the ages of 8 and 21 who presented with a psychiatric chief complaint in the JHH and UMMC Pediatric EDs from March 2013 through December 2016 (195 weeks), who were administered the ASQ by nursing staff was extracted from the ED's electronic health records. Characteristics examined included patient's arrival date, gender, age, race, chief complaint, discharge diagnosis, disposition, ASQ responses, and medical history. In addition, nursing compliance, answers to individual items and psychometrics (i.e., sensitivity and specificity) will be compared across age groups.
Results: Preliminary statistical analyses compared the characteristics of the younger (ages 8 – 9; n = 81) and older (ages 10 – 21; n = 1057) patients (with more data to be included by the time of the symposium). Sixty-nine percent of patients 8-9 years old who screened positive for the ASQ did not present to the ED for suicide. Initial analyses revealed that there was a significantly higher proportion of females in the older ASQ screened positives than in the younger ASQ screened positives, but no significant differences for the presenting complaint of suicide ideation or suicide attempt, disposition of admit/transfer versus discharge, or in regard to any of the individual ASQ screening form items.
Discussion: The ASQ successfully identified patients 8-9 years old at risk of suicide who may not have been identified otherwise. Further research should be done to validate the ASQ for children younger than 10.

2. ASSESSMENT OF SUICIDE RISK IN CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM DISORDER PRESENTING TO A PEDIATRIC EMERGENCY DEPARTMENT

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Background: In 2015, suicide was the third leading cause of death among children ages 10 to 14 and the second among children ages 15 to 19. While many psychiatric disorders are risk factors for suicidal ideation and behavior in youth, recent research indicates that those with autism spectrum disorder (ASD) are at an elevated risk for suicidal thoughts and behaviors. It is difficult to assess suicide risk in patients with ASD because of their limited verbal and communication skills. Given the challenges of identifying suicidality in youth with ASD, and the frequency that they present to the Emergency Department (ED), developing methods to assess suicidal ideation in patients with ASD in ED settings is essential in determining the patient's safest disposition plan. The efficacy of the Ask Suicide Screening Questionnaire (ASQ) in detecting suicidality in pediatric ED patients with ASD and the characteristics of children and adolescents with ASD who reported suicidal ideation were examined in a retrospective analysis of children and adolescents with ASD who screened positive for suicide risk on the ASQ at the Johns Hopkins Pediatric ED.
Methods: Pediatric patients with ASD were administered the ASQ, as part of standard of care, during triage between March 2013 and April 2016 in the Johns Hopkins Pediatric ED. The ASQ is a 4-item suicide screening tool that can be administered to patients in the ED by nurses regardless of psychiatric training. The ASQ has high sensitivity and negative predictive value, and can identify the risk for suicide in patients presenting to pediatric ED.

31 of the 104 patients screened positive for suicide risk. A retrospective chart review was conducted for 21 of the 31 patients with ASD who screened positive for suicide risk on the ASQ.
Results: This sample included 2,455 children and young adults ages 8 to 21 who presented to the Johns Hopkins Pediatric ED and were administered the ASQ (patients with ASD, n=104; patients without ASD, n=2351). There were significantly more youth without ASD who screened positive on the ASQ compared to general screening (48%% versus 24%, $p < .01$). Moreover, in the ASD group, a significantly greater number of youth with ASD screened positive on the ASQ compared to general screening (30% versus 11%, $p < .01$), indicating that the ASQ picked up 19 additional cases of suicidality among this group. The most common comorbid psychiatric diagnoses were anxiety disorders (n=11, 52%), attention-deficit/hyperactivity disorder/oppositional defiant disorder (n=9, 42%) and mood disorders (n=8, 38%). Suicide attempts (ASQ4) were reported among 12 youth and consisted of the following methods: stabbing/cutting (5), jumping from a height (2), choking/holding breath/hanging (3), overdose (1), and firearms (1).
Discussion: The purpose of this presentation is to demonstrate that brief suicide screening instruments, like the ASQ, can be incorporated into the standard of care in pediatric ED settings, and can assess suicide risk in children and adolescents with ASD. As exhibited by the patients who were uniquely identified, without a standardized suicide risk screening protocol in place, it is possible for patients with ASD to pass through the ED with undetected suicidality. Additional research is needed to examine the validity of the ASQ in ASD populations and to identify specific risk factors and clinical determinants that characterize suicidal behaviors in youth with ASD in acute settings.

3. PERCEIVED BURDENSOMENESS, ATTITUDINAL FAMILISM, AND SUICIDAL IDEATION IN ADOLESCENT INPATIENTS

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Background: Suicidal ideation is alarmingly prevalent in Hispanic adolescents, who report greater rates of ideation than other major ethnoracial same-aged groups in the United States (CDC YRBS, 2015). Perceived burdensomeness, or beliefs that one is a burden or tax on close others and society, is one risk factor for suicidal ideation proposed by the interpersonal theory of suicide (Joiner, 2005), which has been evidenced in Hispanic individuals (Hill & Pettit, 2012). Little is known about how culturally-relevant factors, such as attitudinal familism, may intersect this known risk relation to mitigate or exacerbate suicidal ideation in Hispanic youth. Understanding how attitudinal familism interacts with the relation between perceived burdensomeness and suicidal ideation in Hispanic adolescents remains of empirical and clinical importance, given that such an investigation would increase understanding of cultural specific processes impacting interpersonal risk for suicide, and findings may inform the development of culturally-sensitive interventions for suicidal ideation in Hispanic youth. Against this background, the current study examined the relation between perceived burdensomeness, attitudinal familism, and suicidal ideation in a psychiatric sample of N = 81 Hispanic adolescent inpatients. The aims of the current study were two-fold: 1) Aim 1: To investigate the direct relations between perceived burdensomeness, attitudinal familism, and suicidal ideation in a Hispanic adolescent inpatient sample; and 2) Aim 2: To investigate the moderating effects of attitudinal familism on the relation between perceived burdensomeness and suicidal ideation in Hispanic adolescent inpatients, while controlling for the effects of

potentially relevant covariates (depressive symptoms, gender). The central interaction hypothesis posited that attitudinal familism would mitigate the impact of perceived burdensomeness on suicidal ideation.
Methods: A sample of N=81 Hispanic adolescent inpatients was utilized to study the relations between attitudinal familism, perceived burdensomeness and suicidal ideation. The Interpersonal Needs Questionnaire- 15 Item Version (INQ-15; Van Orden, Cukrowicz, Witte, & Joiner, 2012) was used to examine perceived burdensomeness, the Attitudinal Familism Scale (AFS; Lugo Steidel & Contreras, 2003) was used to examine attitudinal familism, and Modified Scale for Suicidal Ideation (MSSI; Miller, Norman, Bishop, & Dow, 1986) was used to examine suicidal ideation. The proposed moderation model was tested in SPSS Statistical Software Version 24.0 using the Process Macro (Hayes, 2013), a statistical add-on. In the current study, the proposed moderation model included total INQ-15 perceived burdensomeness score as independent variable (IV),
total AFS score as the moderator, total MSSI score as dependent variable, and total BDI-II score and gender (coded dichotomously) as covariates.
Results: Results showed a nonsignificant interaction effect for the role of attitudinal familism, which trended towards significance in a mitigating direction at $p = .08$ with low achieved power.
Discussion: Overall, the current study evidenced a nonsignificant interaction effect for the main study hypothesis, however low achieved power and effect size indicate increased likelihood of type II error and that a true mitigating effect may have been missed. Indeed, the trend towards significance does suggest that a trend for attitudinal familism buffering the impact of perceived burdensomeness on suicidal ideation, consistent with our hypothesis that perceived family support and cohesion may alleviate the effects of perceived burdensomeness in extra-familial relations on subsequent thoughts about suicide.

4. CYBER BULLYING AND SUICIDALITY: IS IT A "WHITE THING?"

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Background: There is substantial evidence that traditional bullying, such as face to face encounters, increases the risk of suicidality. However, there is relatively little systematic work on the association between bullying on the internet and suicidality. Further, the extent to which racial and ethnic subcultures might moderate this association is largely unknown. The present study fills this gap by assessing the relative importance of cyber bullying as a predictor of suicide attempts among African American and Caucasians taken separately. Racial differences in the link between cyber bullying and suicidality might be anticipated from the standpoint of racial differences in the subculture of violence and the digital divide. It is plausible that groups with relatively high rates of active physical aggression may respond to cyber bullying with physical force as opposed to internalizing aggression the form of suicidality. In 2014, for example, CDC national data found that the rate of homicide for African Americans ages 15-19 (25.9/100,000) was 8.9 times that of Caucasians (2.9/100,000). In this context, cyber bullying victimization may be less apt to foster internalization of aggression among blacks than Caucasians. In addition, there has been a digital divide between whites and blacks. To the extent that they have relatively less access to the internet, minorities have less opportunity for cyber bullying, and less opportunity to retaliate online.
Methods: Data are taken from the Centers of Disease Control's Youth Risk Behavior Survey for 2013. These data refer to a nationally representative sample of high school students. The

central dependent variable is a dichotomy: the reporting of a suicide attempt during the last twelve months. The key independent variable is cyber bullying. It is measured by the one available item in the YRBS: "During the past 12 months have you ever been electronically bullied?" Constructs are included to ascertain mediating influences of variables related to bullying victimization. These include psychiatric measures of mental disorders such as major depression and eating disorders, measures of violence involvement, school integration, and demographics. Complete data were available for 5,449 whites and 2,987 African Americans. Since the dependent variable is a dichotomy, multiple logistic regression techniques are appropriate

Results: As anticipated, African Americans were less apt to report cyber bullying victimization than whites (7.6% vs. 17.7%). In contrast, African American were significantly more involved in fights requiring medical attention for injuries than whites (4.4% vs. 2.2%). Two bivariate logistic regression analyses found that cyber bullying elevated the risk of a suicide attempt. However, as anticipated, the association was weaker for blacks (odds ratio. OR= 3.6, p=.0000), than whites (OR=6.6, p=.0000). Controlling for all the independent variables reduced the risk for suicide attempts for blacks (OR=1.7, p=.0126) and for whites (OR=2.8, p=.0000).

Discussion: Controlling for a broad range of psychiatric and social factors, a significantly stronger association between cyber bullying and suicidality was found for whites compared to blacks. Further work is needed to test to what extent cultural contexts explain this finding. This is the first systematic analysis of racial differences in the association between cyber bullying victimization and suicide attempts.

5. SUDDEN PARENTAL DEATH FROM EXTERNAL CAUSES AND RISK OF SUICIDE IN THE BEREAVED OFFSPRING: A NATIONAL STUDY

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Background: Previous research has revealed that parental bereavement from external causes is associated with an increased risk of suicide in offspring. Findings from empirical studies are, however, sparse and inadequate with respect to the potential effects of the specific cause of death, gender of the deceased and bereaved, age at bereavement and suicide, and time since bereavement. This is information that may aid health personnel to identify individuals at high risk and better pinpoint the targets of prevention and intervention programs.

Methods: The present nested case-control study was based on individual data from three Norwegian longitudinal registers. Subjects comprised 19 015 persons who died from suicide at an age of 11-64 years during 1969-2012 (cases), and 332 046 live comparison individuals matched for gender and date of birth. Information about deceased parents' cause and date of death, and demographic and socioeconomic data was retrieved and merged. Suicide risk associated with parental bereavement from external causes was assessed using conditional logistic regression.

Results: Losing a parent to suicide, transport accidents and other external causes of death was associated with an increased suicide risk in offspring. Moreover, parental suicide was associated with a substantially higher suicide risk than transport accidents and other external causes. These effects were equally strong for daughters and sons, and for the loss of a mother, father or both parents. Suicide risk was highest in younger bereaved offspring, and bereavement had both short and long-term impacts on suicide risk.

Discussion: All offspring exposed to parental death by external causes have an increased suicide risk, independent of factors related to the exposure. The consequences are long lasting, and offspring should be offered follow-up in primary healthcare. Younger offspring bereaved by parental suicide have the highest risk and may be targeted for prevention and intervention programs in specialist healthcare.

6. SEXUAL ORIENTATION AND SUICIDE IDEATION AMONG INNER-CITY DRUG USERS

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Background: Evidence suggests that sexual minorities are at greater risk for poor health outcomes. Suicide risk and drug use are two such areas where this health disparity appears especially great. This study adds to the health disparities literature by examining suicide ideation among sexual minority inner-city drug users.
Methods: A community sample of 266 adults aged 18-55 who reported heroin or cocaine use in the prior year was recruited from Baltimore, MD. Stepwise multiple logistic regression analyses are used to examine the differential contribution of sexual orientation on suicide ideation adjusting for socio-demographic, socioeconomic, risk behaviors, and neighborhood effects.
Results: A majority (61%) of drug users who report being homosexual or bisexual report ever having thought of killing themselves, compared with more than a third (37%) of drug users who identify as heterosexual. Depression, homelessness, low socioeconomic status, poor neighborhood conditions, risky sexual behavior, opiate use, and previous overdoses are also associated with suicide ideation. Sexual orientation remains significant in a stepwise multivariable logistic regression and the effect of sexual orientation on suicide ideation is comparable to the experience of homelessness. Indeed, identifying as homosexual or bisexual is associated with 2.3 times greater likelihood of suicide ideation (compared to 2.7 times greater likelihood for experiencing homelessness). Moreover, results suggest there may be an interaction between sexual orientation and age such that greater age is associated with a slight decline in likelihood to report suicide ideation among older heterosexual drug users whereas the opposite may be true for older sexual minority drug users.
Discussion: According to minority stress theory, those who occupy minority status within the larger society experience disparities in health outcomes due to prejudice, discrimination, and social rejection. Two areas where evidence suggests this disparity may be greatest for sexual minorities is drug use and suicide- two factors that are also known to associate in the general population. Despite the apparent increase in burden, there is relatively little research or intervention that targets sexual minorities. Moreover, intersectional approaches that identify risk for sexual minorities within specific populations are also lacking and theory would suggest that these overlapping vulnerabilities may contribute to uniquely greater risks. This study adds to the existing health disparities literature by showing how sexual minorities among inner-city drug users do appear to be at an increased risk. The burden may be especially high among homeless sexual minorities where the risks compound and these vulnerable statuses overlap.

NEUROBIOLOGY OF SUICIDE: BIOMARKERS

Chair: Yogesh Dwivedi, University of Alabama at Birmingham

1. A PRELIMINARY FMRI STUDY OF EMOTION REGULATION AND SUICIDAL IDEATION

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Background: Our knowledge about the neural underpinnings of adolescent suicide is significantly limited. This is concerning given that suicide is currently the second leading cause of death among individuals ages 10-24 in the United States. Rates of suicidal ideation (SI) and behavior increase dramatically during adolescence (Nock et al., 2013). The importance of identifying concrete biological markers of suicide risk is underscored by recent research demonstrating that our ability to predict suicidal behavior after decades of research on common psychosocial risk factors remains unacceptably low (Franklin et al., 2017; Ribeiro et al., 2016). Research on mechanisms linking well-known risk factors to SI may help progress knowledge in this area. Emotion regulation represents a potential underlying mechanism. Indeed, poor emotion regulation has been linked with SI across self-report and psychophysiological data (e.g., Rajappa, Gallagher, & Miranda, 2012). Previous research examining neural mechanisms in adult suicide has implicated decreased functioning in prefrontal areas often implicated in emotion regulation (van Heeringen & Mann, 2014). Here we examined whether activation in lateral and medial prefrontal cortex during emotion regulation distinguished adolescents with and without SI.
Methods: Forty-nine adolescents (ages 13-20; M = 16.95, SD = 1.54; 59% female) completed self-report (Beck Scale for Suicidal Ideation) and clinical interviews (Self-injurious Thoughts and Behaviors Interview) assessing SI and participated in an emotion reactivity and regulation task (Ochsner et al., 2004) while undergoing functional magnetic resonance imaging. We specifically examined activation for trials in which participants were asked to decrease their emotional reaction to a negative image using cognitive reappraisal relative to trials in which they simply viewed a negative image drawn from the international affective picture system (IAPS). Based on existing evidence of regions involved in cognitive control of emotion, we identified five a priori regions of interest using Freesurfer cortical mapping. These were right and left lateral orbital frontal cortex (right and left lOFC), and right inferior frontal gyrus. We conducted logistic regressions to compare youth with versus without histories of SI.
Results: Only activation in the lOFC (OR = .93, $p < .05$) distinguished adolescents with and without SI. Specifically, individuals with SI were less likely to active the lOFC during emotion regulation trials compared to those without SI. Importantly, the magnitude of this effect remained unchanged after controlling for depression, which is a strong predictor of SI. Further, among those without SI, greater lOFC activation was negatively correlated with self-report emotional intensity during trials when viewing negative stimuli.
Discussion: Overall, it appears that adolescents without SI were able to successfully recruit the lOFC in support of emotion regulation, whereas adolescents with SI were not. Results suggest recruitment of the lOFC in the context of emotion regulation may be involved in risk of SI in adolescents. Clearly, more research is needed to begin refining a neural model of risk for adolescent suicide to more carefully and strategically target preventive interventions.

2. PRELIMINARY EVIDENCE FOR DYSREGULATION IN MGLUR5 AS A BIOMARKER OF SUICIDAL IDEATION IN PTSD: A PET IMAGING STUDY

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Background: Posttraumatic stress (PTSD) and major depressive (MDD) disorders are independently associated with all forms of suicidal behavior (ideation, attempt, and death by suicide; Bolton & Robinson, 2010), and risk increases markedly when they present together

(Panagioti, et al., 2012). However, there is no pharmacological treatment developed specifically to reduce suicide and suicide-associated behaviors in these disorders. The current study was designed to evaluate a novel potential biomarker for suicide risk in this population. The metabotropic glutamate receptor 5 (mGluR5) is implicated in the pathophysiology of psychiatric disorders such as PTSD and MDD, as well as suicidal behavior. MGluR5 was also shown to play an important role in emotion regulation (Terbeck, et al., 2015), and heightened mGluR5 availability is associated with noted suicide risk factors, such as pain experience (Blackshaw, et al., 2011), and sleep disturbance (Elmenhorst et al., 2016). In vivo, mGluR5 availability can be measured with radioligand [18F]-FPEB and positron emission tomography (PET) imaging. The purpose of the present study was to investigate the relationship between mGluR5 availability and suicidal ideation in a transdiagnostic sample. We hypothesized that mGluR5 availability would be higher in individuals with present suicidal ideation across diagnostic groups and regions of interest (e.g., OFC, dlPFC, amygdala, hippocampus).
Methods: Participants (n=18 PTSD, 11 with comorbid MDD; n=22 MDD) were recruited through the Yale Translational Brain Imaging Program and National Center for PTSD. All participants underwent physical and psychological screening (e.g. SCID-5, CAPS-5, MADRS, PCL-5). Responses on Beck Depression Inventory II item 9 were used to gauge scan-day SI. Individuals participated in one MRI scan and one [18F]-FPEB PET scan with the radiotracer administered as a bolus plus constant infusion. Volume of distribution (VT), using venous sampling, was the outcome measure.
Results: PTSD and MDD groups did not differ significantly with respect to age, gender or smoking status. Mean depressive symptom ratings did not differ between groups at any time-point, and were indicative of moderate to severe depressive symptom experience (PTSD scan-day M= 20.0; MDD scan-day M= 22.6) in both groups. Mean PCL score in the PTSD group (M = 56.5) was likewise suggestive of moderate PTSD symptoms. Cross-diagnostically and within the MDD group, mGluR5 availability did not differ significantly in any brain regions as a function of scan-day SI. However, in the PTSD group, mGluR5 availability was significantly higher among those reporting scan-day SI (n = 7) across brain regions (p's =.001-.005; 26.6- 29.1% difference), with large effect sizes (d's =1.39-1.70) suggesting clinically meaningful differences. Of note, mGluR5 availability was also significantly higher in the amygdala of individuals with PTSD relative to the MDD group (F = 5.18, p=.028, 16% difference), with trends towards significance observed in the dlPFC, vmPFC, and hippocampus (p's =.054 -.076).
Discussion: Higher mGluR5 availability as a function of current SI was observed in the PTSD group only, implicating mGluR5 dysregulation as a possible state marker of SI specific to individuals with PTSD. Further, it appears individuals with PTSD may have higher mGluR5 availability as compared to the MDD group. These preliminary findings point to mGluR5 as a potential treatment target for PTSD, and to reduce SI in PTSD specifically.

3. NEUROIMAGING CORRELATES WITH SUICIDE IDEATION AND ATTEMPT IN DEPRESSION AND TREATMENT RESISTANCE: A FOCUS ON DOPAMINE AND ANHEDONIA

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Background: Suicide is a serious reality associated with major depressive disorder (MDD). This reality is intensified in individuals with treatment resistant depression (TRD), who have a higher prevalence of attempts and completed suicide. In order to identify sensitive predictors of risk, the neurobiology of suicidal ideation as well as differences among attempters and non-attempters need to be further investigated. While current evidence suggests a role for prefrontal cortex dysfunction in suicide attempters, the impact of receptor function remains unclear. The dopamine system, in particular, is related to reward processing and, therefore, could influence perceptions related to the value of living. Brain imaging of dopamine receptors in people with suicide risk has not been published to date. This presentation will elucidate the neurobiology of suicide risk in depression, specifically as it relates to dopamine D2/D3 receptor activity.
Methods: MDD patients with demonstrated treatment resistance (N=21) received a positron emission tomography (PET) scan to measure extrastriatal D2/D3 receptor binding using [11C] FLB 457. Suicide history was ascertained from either the Structured Clinical Interview for DSM-IV Disorders, MINI International Interview - Suicide Module, or the Columbia Suicide Rating Scale (CSRS), while items 3 and 10, respectively, on the Hamilton Rating Scale for Depression (HRSD), and Montgomery Asberg Depression Rating Scale (MADRS) administered were used as a metric of suicidal ideation. PET data was used to evaluate differences in receptor binding potential among suicide attempters and non-attempters.
Results: Among the TRD sample, there were no demographic differences between suicide non-attempters (n=8) and attempters (n=13). Depression severity was also similar between groups (HRSD: 25.6 vs. 26.0, respectively). Higher bilateral cingulate D2/D3 binding correlated with increased suicidal ideation on both the HRSD and MADRS. Furthermore, increased HRSD-suicide was also associated with increased binding potential in the right thalamus and hippocampus (rs=.61, p=.003; rs=.52, p=.038, respectively). Finally, between group differences demonstrated a trend of greater D2/D3 binding potential in the ACC in TRD patients with suicide attempt history compared with no history (1.64 vs. 1.04, p=.07).
Discussion: The present findings suggest links between cingulate and limbic D2/D3 receptor function, potentially reflecting an impairment in sensory integration and processing. In particular, the anterior cingulate cortex is an area involved in the regulation of emotions, effort required to attain a reward, and to provide context to a potentially rewarding stimulus. Correlation of high D2/D3 binding, reflecting reduced dopaminergic tone, with higher levels of suicidal ideation, suggests the ACC may be an important site for the MDD symptoms of sadness, anhedonia, and suicidal ideation.

4. ALTERED NEURAL VALUE SIGNALS UNDERLIE POOR DECISION-MAKING IN SUICIDAL BEHAVIOR

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Background: Suicidal acts follow a decision, and we argue that a propensity to make disadvantageous decisions facilitates suicidal behavior. This view is supported by at least several converging lines of evidence. First is the association of suicidal behavior with problem gambling and drug addiction, behaviors defined by disadvantageous choice. Second, several although not all studies find that significant subgroups of individuals with a history of suicide attempts lose on gambling tasks, fail to learn from the experience of rewards and punishments, and make short-sighted choices. Third, suicidal behavior has been linked to disruptions of meso-striato-thalamo-cortical signaling pathways, disruptions that severely and

somewhat selectively impair decision processes. Our interpretation of this evidence is that at least some people who engage in suicidal behavior fail to correctly appraise the consequences of their choices, leading them to view suicide as unrealistically attractive at the expense of deterrents and alternative solutions.
Expected outcomes of one's choices -- or expected value signals -- have been shown to be represented in humans by a paralimbic cortical network centering on the ventromedial prefrontal cortex (vmPFC) and the precuneus. Our prior studies (Dombrovski et al., JAMA Psych., 2013; Vanyukov et al. Psych Med, 2016) have provided initial evidence of altered cortical value signals in older suicide attempters. We further investigated whether signals corresponding to learned value vs. the magnitude of obtained reward were disrupted in attempted suicide.
Methods: This is an interim analysis of an ongoing fMRI study contrasting 24 suicide attempters, 14 suicide ideators, 15 non-suicidal depressed individuals and 24 psychiatrically healthy controls. The participants completed a reward learning/decision-making task. The task design enabled us to dissociate learned value from the independently dissociated magnitude of rewards. Using computational modeling, we estimated the predicted time course of expected value signals and mapped these signals to each participant's brain. We then contrasted these neural representations of value between suicide attempters and the comparison groups.
Results: As expected, we observed a double dissociation between learned value signals in the vmPFC vs. reward magnitude signals in the central orbitofrontal cortex. Findings with respect to group differences will be presented.
Discussion: To the extent that our hypotheses are confirmed, the findings suggest the existence of a pathway toward suicidal behavior marked by a failure to make adaptive decisions in a dynamic environment (i.e. a crisis) and deficits in paralimbic computations of expected value. They converge with human and animal lesion studies elucidating the central role of the vmPFC/orbitofrontal cortex in decision-making in complex environments.

5. HUMAN CYTOKINE LEVELS IN SERUM AND CEREBROSPINAL FLUID OF SUICIDAL AND NON-SUICIDAL DEATHS

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Background: Suicidal death is a major global burden found to be associated with inflammation. The imbalance between pro- and anti-inflammatory cytokine levels in several depressive disorders, impulsivity, infectious disease, autoimmune disorder, neurodegenerative disease is thought to be lead cause of suicidal death. Increased expressions of inflammatory cytokines have been observed in neuronal tissue of suicidal death patients. The present study was undertaken to access cytokine levels of serum and cerebrospinal fluid (CSF) in both suicidal and non-suicidal death cases and to find any correlation with sickness behavior of suicide.
Methods: Both suicidal (n=20) and non-suicidal (n=20) death subjects were recruited for cytokines measurement in sera and CSF. The exclusion criteria include poisoning cases and history of medication for immunomodulator, drug abuse and alcohol. Psychosocial parameters of each victim were obtained through interview of close relatives. Human cytokines IL-1β, IL-2, Il-4, Il-6, IL-8, IL-10, IL-13, TNF-α and VEGF levels were measured by using Luminex multiplex assay
Results: Out of 9 human cytokines, significant high levels were observed for IL-6, IL-1β, TNF-α, IL-8, IL-13 and VEGF in sera and CSF of suicidal than non-suicidal cases.

Significant lower levels of IL-2, IL-4 and IL-10 were observed in sera and CSF. Cytokines level in CSF were comparatively lower that serum level. Highest positive correlation of serum level with CSF level were observed for pro-inflammatory cytokine IL-6 (r=0.9), IL-1b (r=0.23), IL-13 (r=0.55), TNF-α (r=0.1) and anti-inflammatory IL-10 (r=0.9). Increased serum and CSF levels of pro-inflammatory IL-6 cytokine in suicidal cases (386.3± 1169 pg/ml; 3.84± 6.47) than non-suicidal cases (275.3± 399.9 pg/ml and 2.643± 3.71pg/ml). Increased IL-6 expression has been seen in impulsive suicidal cases and yet to be correlated with psycho-social parameters of death subjects.
Discussion: There is increasing evidence that inflammatory mediators (Pro inflammatory cytokines IL1b, IL2, IL6, 1L8, IFN-γ, IFNα, TNFα, VEGF etc. and anti-inflammatory cytokines IL4 & IL10) play a role in pathophysiology major depression and suicidal behavior. In our study, the levels of inflammatory cytokines such as IL-6, IL-1β, TNF-α, IL-8, IL-13 and VEGF have increased and IL-2, IL-4 and IL-10 significantly decreased in sera and CSF of suicidal cases in comparison to non suicidal cases. Increased proinflammatory cytokine IL-6 in sera and CSF has been seen in impulsive suicidal cases; however, it is yet to be correlated with psycho-social parameters of the subjects.

6. REDUCED APHA-AMYLASE OUTPUT RATHER THAN CORTISOL DYSREGULATION DISTINGUISHES SUICIDE ATTEMPTERS ON THE TSST

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Background: Dysregulation of the stress response appears to contribute to increased risk of suicidal behavior. Most prior research on stress response has been based on pharmacological challenge paradigms (i.e. the dexamethasone suppression test; Mann & Currier, 2005), but the response to situational, environmental stress may be just as relevant. The Trier Social Stress Test (TSST) is a well-studied psychosocial stress paradigm in which response of the hypothalamic-pituitary-adrenal (HPA) axis is measured via salivary cortisol, and the response of the sympathetic nervous system via changes in salivary alpha-amylase, which functions as a proxy for noradrenergic activation (Thoma, et al., 2012). There are few TSST studies of suicide attempters, and postmortem evidence of both HPA and noradrenergic alterations have been found in suicide victims. This study examined both the HPA and sympathetic components of stress response via the TSST in unmedicated depressed patients with and without histories of suicide attempt, as well as in healthy volunteers.
Methods: A modified version of the TSST was administered to 98 unmedicated patients with current major depressive episode (75 with no suicide history, 23 with prior attempt) and 64 healthy volunteers. Participants were required to give a five-minute speech in front of confederates and perform an increasingly difficult working memory task. Salivary cortisol and alpha-amylase were collected at 5 time points prior to and after the stressor, along with heart rate. Mood response to the task was assessed with the Profile of Mood States (POMS) at pre-stress, post-stress, and at the end of the procedure. Group differences in salivary cortisol, alpha-amylase, mood ratings, and heart rate were assessed across time points.
Results: The TSST produced expected increases in all groups in subjective distress (increase in POMS Tension, Confusion, Depression and Fatigue), heart rate, cortisol and alpha-amylase. Non-attempter patients had the highest heart rate throughout the task and poorest performance on the working memory task. There were no significant group differences in salivary cortisol response (F[2,198]=.91, p=.403) or group by time interaction

(F[8,792]=1.16, p=.319). However, groups differed significantly in salivary alpha-amylase response across time points (F[2,29]=3.08, p=.049), with differences evident at baseline and in overall output (area under the curve with respect to ground).
Discussion: Social stress was associated with reduced alpha-amylase output in suicide attempters, and not with alterations in baseline cortisol levels or cortisol response. We had previously found lower baseline levels of cortisol in past attempters in patients in various stages of treatment (Keilp et al., 2016), as well as in offspring attempters with a family history of suicide attempt (Melhem, et al., 2016), but did not replicate these findings here in a sample of unmedicated, currently depressed patients. Data here suggest that dysfunction in the sympathetic arousal system rather than HPA system may play a critical role in suicide attempters' adaptation to stress. Low alpha-amylase is consistent with reduced norepinephrine activity and with underactivation of the sympathetic arousal system when mounting a transient stress response. Further research is needed on the interaction of these two components of the stress response system and their relationship to other risk factors for suicide attempt.

RISK, ASSESSMENT, AND INTERVENTIONS IN ADOLESCENT SUICIDALITY

Chair: Cheryl King, University of Michigan Medical School

1. WHAT DISTINGUISHES ADOLESCENTS WITH SUICIDAL THOUGHTS FROM THOSE WHO HAVE ATTEMPTED SUICIDE? A POPULATION-BASED STUDY

Becky Mars*[1], Jon Heron[1], E. David Klonsky[2], Paul Moran[1], Rory O'Connor[3], Kate Tilling[1], Paul Wilkinson[4], David Gunnell[1]

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Background: Thoughts of suicide (suicidal ideation) are common in adolescents, and are a well-established risk factor for suicidal behaviour. Although a large number of risk and protective factors for suicidal behaviour have been identified, little is known about the factors that differentiate those most likely to attempt suicide from those who only think about suicide. This is a crucial issue, as only a third of young people will act on their suicidal thoughts. Identifying factors that best distinguish between these groups of adolescents has important implications for both clinical practice and suicide theory.
Methods: Participants were 4,722 members of the Avon Longitudinal Study of Parents and Children (ALSPAC), a UK population-based birth cohort. Suicide ideation and attempts were assessed at age 16 years via self-report questionnaire. Multinomial regression was used to examine associations between factors that differentiated adolescents in three groups: no suicidal thoughts or attempts; suicidal thoughts only; and suicide attempts.
Results: Compared to adolescents with suicidal ideation, those who attempted suicide were more likely to report exposure to self-harm in others (adjusted OR for family member self-harm 1.95; for friend self-harm 2.61; for both family and friend self-harm 5.26). They were also more likely to have a psychiatric disorder (adjusted OR for depression 3.63; adjusted OR for anxiety disorder 2.20; adjusted OR for behavioural disorder 2.90). Other risk factors that were more strongly associated with suicide attempts compared to ideation included female gender, lower IQ, higher impulsivity, higher intensity seeking, lower conscientiousness, a greater number of life events, body dissatisfaction, hopelessness, smoking and illicit drug use.
Discussion: The extent of exposure to self-harm in others and the presence of psychiatric disorder most clearly differentiate adolescents who attempt suicide from those who only

experience suicidal ideation. Recognising the importance of these characteristics may help practitioners to identify which young people with suicidal ideation are most at risk of acting on their thoughts. Further analysis with this cohort will prospectively follow-up those with suicidal ideation, to explore whether the factors identified in this study predict subsequent suicide risk.

2. COMPUTERIZED ADAPTIVE SCREEN FOR TEEN SUICIDE RISK: DEVELOPMENT AND INITIAL THREE-MONTH PREDICTIVE VALIDITY IN ED-STARS NATIONAL SAMPLE

Cheryl King*[1], Jacqueline Grupp-Phelan[2], David Brent[3], Charles Casper[4], Robert Gibbons[5]

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Background: Suicide is the 2nd leading cause of death among youth ages 12 to 17 in the United States. However, many youth at high risk for suicide go unrecognized and untreated, and many youth who die by suicide have never received any mental health services. In fact, for approximately half of adolescent suicide victims, the first attempt is fatal. Evidence-based screening and recognition strategies are sorely needed. This presentation will describe: (1) the development of a computerized adaptive screen for teen suicide risk (CAS-Teen Suicide Risk), based on multidimensional item response theory, in a sample of youth seeking emergency medical services; (2) the sensitivity and specificity of the CAS-Teen Suicide Risk for the prediction of a suicide attempt during a 3-month period; and (3) how these sensitivity and specificity levels compare to those obtained with a) a screen developed from the same data via a machine learning approach and b) the Ask Suicide-Screening Questions (ASQ), a traditional screening tool. This study was conducted in collaboration with the federally funded Pediatric Emergency Care Applied Research Network (PECARN) and the Whiteriver PHS Hospital, which serves the White Mountain Apache tribal nation.
Methods: Study participants were 6743 youth, ages 12 to 17 years, who presented to one of 14 emergency departments (EDs) during randomly selected recruitment shifts and participated in a universal suicide risk assessment. The suicide risk survey included 121 questions assessing a broad range of suicide risk factors, including suicidal ideation and intent, previous suicide attempt, nonsuicidal self-injury, depression and anxiety, hopelessness, agitation, sleep disturbance, sexual and physical abuse, family and peer connectedness, peer victimization, and impulsive aggression, among others. A 3-month telephone follow-up interview was conducted with a subsample of participants enriched for moderate and high risk of suicide attempt (n = 1957, 70% retention).
Results: The CAS-Teen Suicide Risk requires an average of 11 items that can be self- or clinician-administered in 2 minutes. In this development study, the screen has a specificity of 80% and sensitivity of 83% (cross-validated) for detecting a risk of suicide attempt of during the three months following the ED visit (probability threshold of 7% of a suicide attempt in the next 3 months). At specificity of 90%, sensitivity is 66% (cross-validated) with a probability threshold of 12% for a suicide attempt during this period. The addition of demographics does not improve specificity and sensitivity. These levels are better than those obtained with 180 different machine learning algorithms applied to adolescents' responses to all survey items. One promising machine learning algorithm (GLM Boosting) identified a predictor with 6 items with specificity of 90% and sensitivity of 62%. By contrast, when applied to these same data, the ASQ had a high sensitivity of 96%, but low specificity (68%).
Discussion: Findings suggest it is possible to develop an adaptive suicide risk screening tool for teens with sufficient specificity and sensitivity for clinical use in emergency departments.

In contrast, the high sensitivity of the ASQ was achieved at the expense of screening 37% of all youth positive, making it impractical for routine use in the ED. A second advantage of the CAS-Teen Suicide Risk is that it has the potential to identify suicide risk in youth who do not report suicidal thoughts or behavior. Although these findings need to be validated prospectively, they suggest the potential of a brief, adaptive screen for widespread dissemination to assist with the recognition of teen suicide risk and clinical triage decisions.

3. IRRITABILITY AND DEPRESSIVE MOOD DURING CHILDHOOD AND ADOLESCENT SUICIDAL BEHAVIORS: A POPULATION-BASED COHORT STUDY

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Background: Irritability and depressive mood are both core symptoms of depression in youths and co-occur in one third of the cases. Previous studies suggested that the phenotype showing both depressive mood and irritability differs from the phenotype showing depressive mood only in terms of comorbidity (e.g., sleep disorders, severity of depression). However, no study examined the joint contribution of depressive mood and irritability during childhood in the prediction of later suicidality. Therefore, it is unknown whether those phenotypes differently predict suicidal behaviors. The aim of this study is to test the association between longitudinal profiles of irritability and depressive mood during childhood, and suicidal behaviors during adolescence.
Methods: Participants (n=1630) were drawn from the Québec Longitudinal Study of Child Development, a 17-year population-based birth cohort study including 2120 children born in 1997/98 in the Canadian province of Quebec. Childhood irritability and depressive mood were assessed repeatedly by teachers between ages 6 and 12 years (5 time points). Group-based multi-trajectory modeling was applied in order to identify groups of individuals (profiles) defined by the joint developmental trajectories of irritability and depressive mood from 6 to 12 years. The identified profiles were used as main predictor. The main outcome was adolescent's suicidality (i.e. showing either serious suicidal ideation or attempts in the past 12 months) from 13 to 17 years. Logistic regression was used to test the association between profiles of irritability and depressive mood, and suicidality.
Results: We identified 5 profiles: (1) very low symptoms, and (2) low symptoms (combined, 53.7%; thereafter 'low symptoms'), characterized by no irritability and low depression; (3) 'irritability only' (25.8%), characterized by moderate irritability and low depression; 'depression only' (5.3%), characterized by low irritability and high depression, and 'irritability & depression' (11.7%), characterized by high irritability and high depression. Compared with participants in the 'low symptoms' profile, multivariable logistic regression controlling for sex, socioeconomic status, maternal age, and difficult temperament of the child showed that the 'irritability only' profile (OR: 1.81, 95%CI: 1.23-2.66, p=0.002) and 'irritability & depression' profile (OR: 2.14, 95%CI: 1.28-3.60, p=0.004) predicted suicidality in adolescence. The 'depression only' profile did not significantly predict later suicidality (OR: 1.52, 95%CI: 0.77-2.99, p=0.224).
Discussion: Children with both irritability & depression, and those with irritability only were at higher risk for suicidal behaviors during adolescence. Early manifestation of chronic

irritability during childhood could be considered as a risk factor for later suicidality, especially when associated with depressive symptoms. Preventive intervention should target even moderated levels of chronic irritability in children.

4. CYBERBULLYING AND SUICIDALITY DURING ADOLESCENCE: CROSS-SECTIONAL AND LONGITUDINAL INVESTIGATIONS

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Background: While suicide at any age is a tragedy, it is particularly distressing when it occurs early in the life-course. One of the key risk factors specific to the lives of adolescents that has attracted considerable public attention recently; is cyberbullying. Cross-sectional studies report that cyberbullying is associated with suicidality in adolescence, but longer-term associations are uncertain.

Methods: Objective: To test whether adolescents who are cyber-bullied are at heightened risk for suicidal ideation and suicide attempt, using both cross-sectional and longitudinal investigations. As victims of cyberbullying may also be the target of traditional bullying (i.e. physical/verbal/relational), we also tested whether cyberbullying increased the risk of suicidality beyond traditional bullying and other key confounders including sex, socioeconomic status, family structure and functioning, and hostile-reactive parenting.
Design, Settings, and Participants: Participants are members of The Quebec Longitudinal Study of Child Development, a prospective birth cohort of 2120 individuals born in 1997\98 in the Canadian province of Quebec who were followed-up to age 17 years (2015). We included ~1400 participants with self-reported information on cyberbullying and suicidality at ages 13, 15 or 17 years.
Exposures: Frequency of cyberbullying (e.g. insults, threats, intimidation) on the internet or by cellphone (perpetrated by other students) since the beginning of the school year
Outcomes: Past 12-month suicidal ideation (serious thoughts of wanting to die without attempting suicide) and suicide attempt.

Results: The prevalence of adolescents who were cyberbullied either once, a few times, or often was, respectively, 5.5%, 2.4% and 1.2% at age 13, 9.9%, 4.4%, and 1,3% at age 15, and 4.1%, 2.6%, 0.6% at age 17 years. Cross-sectional analyses indicated that cyberbullying was generally associated with both suicidal ideation and suicide attempt at all ages, even after adjusting for confounders and traditional bullying. Associations were stronger for suicide attempt than for suicidal ideation. For example, being cyberbullied (e.g. either once/few times/often) at 15 years was concurrently associated with suicidal ideation (OR 2.26, 95% CI 1.05-4.78) and suicide attempt (OR 4.84, 95% CI 2.15-11.03) after adjusting for confounders and concurrent traditional bullying. In longitudinal analyses, cyberbullying did not predict suicidal ideation and suicide attempt.

Discussion: Overall, victims of cyberbullying were at a heightened risk for suicidality, with stronger effect for suicidal attempts than ideation. The association was specific to cyberbullying as the effect remained after controlling for traditional bullying. However, our study showed that cyberbullying did not have a predictive association with suicidality while other studies have shown the long-term effects of traditional bullying on suicidal behaviors. Health care professionals and clinicians should consider routinely screening for suicidality in patients that were victims of cyberbullying as a preventive measure.

5. ECOLOGICAL MOMENTARY ASSESSMENT (EMA) WITH SUICIDAL ADOLESCENTS AFTER PSYCHIATRIC HOSPITALIZATION: LESSONS ABOUT FEASIBILITY AND ACCEPTABILITY

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Background: Ecological Momentary Assessment (EMA) allows for repeated assessment of behavior in real-time while minimizing recall bias and maximizing ecological validity. EMA data collection could provide an opportunity to capture dynamic processes that influence suicide risk in individuals' natural environments. Despite its many advantages, EMA data collection has been underutilized in the field of suicide prevention. While EMA has been shown to be feasible with and acceptable by psychiatric populations, including depressed and self-injuring youth, its application to studying post-discharge functioning among suicidal adolescents has been limited. We will describe challenges and opportunities in developing an EMA protocol for collecting post-discharge outcomes among adolescents following psychiatric hospitalization, with the goal of reporting on feasibility and acceptability of this approach among high-risk teens. We will also report preliminary results describing patterns of post-discharge suicidal ideation.

Methods: Participants were 35 adolescents (27 females and 8 males; ages 13-17) who were psychiatrically hospitalized due to last-month suicide attempt or last-week suicidal ideation. Adolescents responded to daily questionnaires using a survey link sent to their cell phones for 4 consecutive weeks after discharge. Questions assessed a range of risk and protective factors, including suicidal ideation and presence of suicidal behavior each day. Participants were asked about their experience with the EMAs two– and four-weeks after beginning the daily surveys.

Results: EMA data collection is ongoing and will be completed in June 2017. Thus far, 27 adolescents completed the 4-week data collection. We will report on teens' perceptions of (1) ease of filling out the EMA surveys; (2) ease of understanding survey questions; (3) perception of privacy; (4) extent to which surveys were annoying or disruptive; and (5) willingness to participate in a similar study again. We will be able to compare if there were differences in these perceptions between week 2 and week 4. We will also report the extent to which teens felt filling out the surveys changed their mood or thoughts. With regard to experiences of suicidal thoughts and behavior, examination of available data suggests that 7 out of 27 teens did not endorse any suicidal ideation. Of all the daily entries, 26% included endorsement of suicidal ideation and 2 teens reported a suicide attempt. When data collection is completed, we will describe patterns of suicidal ideation (presence, frequency, duration, etc.) over the 4 weeks after discharge.

Discussion: The study adds to the relatively limited literature on EMA data collection with individuals at elevated suicide risk. Despite their potential to capture more nuanced and dynamic factors associated with suicide risk in real time and in the individual's natural environment, EMA methods have been underutilized in this context and with teens hospitalized due to suicide risk in particular. We will report on initial feasibility and acceptability of EMA data collection in addition to discussing procedural aspects of conducting a study utilizing this approach with suicidal adolescent inpatients following discharge. We will also discuss the associated study protocol, which allowed the research team to safely monitor and respond to indicators of risk during the critical risk period after inpatient hospitalization.

6. SKILLS TO ENHANCE POSITIVITY IN SUICIDAL ADOLESCENTS (STEP)

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Background: We developed a skills-based program "Skills to Enhance Positivity (STEP)" based on Fredrickson's empirically-supported Broaden and Build model which asserts that the function of positive affect includes helping individuals thrive by increasing social supports, improving problem-solving, and increasing personal resilience, areas instrumental in decreasing suicidal behavior. STEP was designed for the highest risk adolescents, those admitted to an inpatient psychiatric unit due to suicide risk. In addition to providing psychoeducation on the function of positive affect, STEP focuses on 3 sets of skills: mindfulness meditation, gratitude, and savoring. There are 3 individual sessions and 1 family session delivered on the inpatient unit, followed by 1 month of daily text messaging (SMS), with optional extension of 3 months, to facilitate practice of mood monitoring and positive affect skills.

Methods: Participants were adolescents hospitalized for suicidality, between 14-18 years old. Assessments were completed at baseline, post-treatment (1M) and follow-up (4M), with final phone f/u at 6 months. We obtained assent/consent and enrolled 20 adolescents into the Open Development Trial (mage=15.9; SD=1.5), and 52 into the RCT (mage=15.6; SD=1.5). Randomization was to either STEP (n=26) or enhanced treatment as usual (ETAU) which received healthy habits text messages (n=26). Participants were predominantly female (67%) and White (76.5%).

Results: STEP was feasible and acceptable to adolescents and parents, with average session attendance above 80% and SMS response rates around 70%, significantly higher than the 49% observed in ETAU (p=.04). Over 50% in the RCT opted for a 3-month extension of SMS. There were no completed suicides, and only 1 suicide attempt in the open trial, much lower than expected rates based on prior studies. In both STEP conditions there were 50% less suicidal events (attempts or emergency interventions to intervene in a suicide attempt) compared to ETAU and 50% less participants reporting suicide events. Parent in the STEP condition reported significant between-group improvement in depression (BDI) at post-treatment (F=7.27, p=.01, eta sq=.157), impairment (CIS) at follow-up (F=7.44; p=.01; eta sq=.193), compared to parents in ETAU. Furthermore, there was a significant between-group difference in attention to positive words on a dot probe task with STEP participants reporting faster reaction times compared to ETAU (F=3.55, p=.05). There was support for within group improvements on satisfaction with life, non-judging, and problem-solving observed in the STEP condition at both post-treatment and follow-up. Some effects which were observed in the STEP group only (gratitude, savoring, social support) were no longer present at follow-up.

Discussion: Both the in-person phase and the remote delivery phase via SMS of STEP are feasible to administer and acceptable to adolescents and parents. The current data indicate preliminary efficacy of STEP in reducing suicidal behaviors, depression, and impairment, and improving gratitude, non-judging, and savoring. There is also preliminary support for improvements in social support, problem solving, and satisfaction with life. However, these results are based on very small sample sizes, and there was mixed support for several of our outcomes. A larger study is needed to more firmly establish efficacy, and adaptations are underway (e.g., group format) to facilitate dissemination in real world settings.

EPIDEMIOLOGY ACROSS THE LIFECOURSE

Chair: Jill Harkavy-Friedman, American Foundation for Suicide Prevention

1. SUICIDAL BEHAVIOR IN ELEMENTARY SCHOOL-AGED CHILDREN: USING THE NATIONAL VIOLENT DEATH REPORTING SYSTEM (NVDRS) NARRATIVE DATA TO GAIN MORE INSIGHT

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Background: Between 2000 and 2015, 567 youth ages 5 to 11 years old died by suicide. Suicide in elementary school-aged children is rare compared to older youth and adults yet an increase in Black males (from 1.78 to 3.47 per 1 million) was seen in this age group when examining racial differences. Understanding the problem of suicide and what interventions are available for this age group is critically important in preventing these behaviors.
Methods: This study used both quantitative and qualitative data in the National Violent Death Reporting System (NVDRS) capturing suicide deaths from 2003 to 2012 for 17 US states to gain a better understanding of the problem of suicide in elementary school-aged children. The qualitative data included the NVDRS narrative reports. These narratives are from multiple sources (e.g., coroner, law enforcement) and describe in detail the circumstances surrounding the child's death.
Results: Eighty-seven children between 5 and 11 years old died by suicide during this timeframe; however, 84 of the children had narrative data available. The majority of the children were male (85.1%) and Non-Hispanic (88.5%). The sample was racially diverse (White=50.6%; Non-White=49.4%). Children who died by suicide did so by hanging, strangulation, or suffocation (80.5%) and 96.6% of the children died in their home. When examining the qualitative data for precipitating circumstances the majority of the children who died by suicide did so impulsively. The suicide death usually occurred very closely to an argument with a family member (52.3%). When examining the narratives for mental health disorders, 35 of the narratives (40.7%) listed a mental health disorder or concern. Of those children, 65.7% indicated ADHD/ADD, anger problems, or aggression and 45.7% indicated depression. When examining the narratives for disclosure of suicidal thoughts, 24 (27.9%) of the narratives stated that the child had disclosed suicidal thoughts to one or more people in the past. When examining suicidal behavior, eight of the narratives indicated the child had attempted suicide in the past.
Discussion: Using the NVDRS data helps to provide an understanding of the problem of suicidal behavior among elementary school-aged children. The narratives provide detailed information concerning the precipitating circumstances surrounding the child's death and uncover potential areas that can be targeted for intervention. These data also indicate that children this young do have suicidal thoughts and behaviors and screening at this age is relevant and should be implemented. Prevention efforts focused on interpersonal problem solving skill development may be an area of focus for elementary school-aged children. The majority of children who died by suicide did so after an argument with a family member. Developing positive interpersonal skills may prevent extreme measures taken when facing interpersonal difficulties. Some programs that have been successful in developing these skills are Promoting Alternative Thinking Strategies (PATH) and the Good Behavior Game. There are a few limitations to acknowledge. The data were limited to 17 U.S. states and the NVDRS

narrative data was not uniform (e.g., some narratives included limited information). These limitations need to be considered when generalizing these findings to other children in this age group. Overall, the study provides some insight concerning precipitating circumstances surrounding suicide in very young children. More research examining other circumstances/risk factors (e.g., social media usage) is needed to help with prevention and intervention efforts in this age group. Screening tools for this age also need to be developed and evaluated.

2. RETHINKING LETHALITY IN YOUTH SUICIDE ATTEMPTS: FIRST SUICIDE ATTEMPT OUTCOMES IN YOUTH AGES 10 TO 24

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Background: Suicide is the second most common cause of death in American youth ages 10 to 24. To date, suicide research has been limited by convenience samples: 1) not representing either psychiatric or general populations; 2) not including individuals dying on first attempt. We aimed to rectify this by recruiting a cohort followed from their first medically recorded attempts (index attempt). We hypothesized this approach would more accurately show prevalence of completed suicide after an attempt and give a truer representation of suicide lethality.
Methods: Our study cohort is a subsample from a previously reported retrospective-prospective study identified through the Rochester Epidemiology Project that recruited individuals with a first suicide attempt coming to medical attention (index attempt) between January 1, 1986 and December 31, 2007. From this all age sample of 1490, we identified 813 Olmsted County residents (N=258 males, N=555 females) between the ages of 10 and 24 who made their index suicide attempt.
Results: 29/813 (3.6%) subjects died by suicide during the study period. Of these 29, 20 (69.0%) died on first attempt. Males accounted for only258/813(31.7%) of the cohort, but comprised the majority of suicides with 23/29 (8.9% of males, 79.3% of suicides) compared to 6/29 females (1.1% of females; 20.7% of suicides). Firearms accounted for 85.0% of deaths on index attempt, with an odds ratio for death when a gun was used compared to all other methods of 334 (95% CI = 75.5->999; $p<0.0001$). No prior psychiatric history was found in 41.2% of all first attempters.
Discussion: Suicidal behaviors emerge in the second decade of life and our data shows that almost three-quarters of those age 10 to 24 dying by suicide succumb on their first attempt. Firearms play a highly disproportionate role in the lethality of suicide attempts in youth. Our results underscore that nearly half of first time suicide attempters have no history of any mental health care interventions. The high lethality of first suicide attempts suggest that prevention efforts commencing after first attempt is too late for many victims.

3. URBAN-RURAL DIFFERENCES IN MARYLAND SUICIDE: THE ROLE OF FIREARMS

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Background: The US suicide rates continue to rise, particularly in rural settings. We hypothesized that the rural-urban suicide rate difference was best explained by firearm use. We hoped to demonstrate this after controlling for individual suicide decedent demographics.
Methods: A retrospective analysis was performed on all 6,196 well-characterized adult suicides in Maryland from 2003 through 2015, as investigated by the Office of the Chief Medical Examiner of Maryland. Rate ratios were computed using census data. Negative binomial regression models were used to compare firearm and non-firearm suicide rates in urban and rural areas, adjusting for sex, age, and race. Interactions between means of suicide and demographic factors were also examined.
Results: Across Maryland's urban-rural continuum, there were significant differences in total suicide rates (chi2=12.42, df=3, p=0.006) and firearm suicide rates (chi2=13.93, df=3, p=0.003), but not in non-firearm suicides. Largest differences were between the most urban counties and most rural, with rural counties demonstrating 35% higher total suicide rates (IRR=1.35, 95%CI 1.07-1.71, p=0.013) and 66% higher firearm suicide rates (IRR=1.66, 95%CI 1.20-2.31, p=0.002), but no significant differences in non-firearm suicides.
After adjusting for sex, race, and age only the firearm suicide rate demonstrated significant rate differences between the most urban and rural counties (IRR= 1.25, 95%CI 1.014-1.540, p=0.037). Non-firearm suicides demonstrated a nonsignificant trend towards lower rural rates than urban rates (IRR= 0.86, 95%CI 0.679-1.075, p=0.180). We found an interaction between urbanicity and sex. Men were more likely to complete suicides in rural environments compared to the most urban environment (IRR=1.19, 95%CI=1.01-1.40, p=.043); whereas women were less likely to complete suicide in rural than the most urban counties (IRR= 0.63, 95%CI=0.43-0.94, p=0.023).
Discussion: Increased rural suicide rates are driven by firearm suicides. Non-firearm suicides show no rate differences in urban versus rural counties. Female suicides are significantly more likely to occur in urban environments than rural, possibly related to the male preference for firearm use. Suicide prevention policies in rural areas should target firearm ownership and safety. Future research should look at reasons for rural firearm predominance.

4. TRENDS IN SUICIDE ATTEMPTS IN THE UNITED STATES BETWEEN 2004-2005 AND 2012-2013: RESULTS FROM THE NATIONAL EPIDEMIOLOGIC STUDY ON ALCOHOL AND RELATED CONDITIONS (NESARC)

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Background: Although trends in suicidal behavior over time have been previously examined in epidemiologic samples, no known studies have re-examined potential changes in suicide attempts in the United States over the last decade. The current study aimed to examine the prevalence of lifetime suicide attempts in 2004-2005 and 2012-2013 in two independent, nationally representative samples of U.S. adults.
Methods: The National Epidemiologic Survey on Alcohol and Related Conditions wave 2 (NESARC 2; n=34,653) and the NESARC-III (n=36,309) were cross-sectional, nationally representative surveys of non-institutionalized U.S. adults conducted in 2004-2005 and 2012-2013, respectively. Trained lay interviewers conducted face-to-face interviews, and lifetime suicide attempts were assessed among respondents via self-report. Weighted frequencies and cross-tabulations examined the prevalence of suicide attempts in both samples as well as by sex and race/ethnicity. All analyses were conducted using STATA software in order to employ the Taylor Series Linearization technique for variance estimation.

Results: The prevalence of lifetime suicide attempts increased from 2004-2005 to 2012-2013: 3.4% (95% confidence interval [CI] 3.2-3.7) vs. 5.2% (95% CI 4.8-5.5). Trends increased over time among both males (2.3% [95% CI 2.0-2.6] vs. 3.6% [95% CI 3.2-4.0]) and females (4.4% [95% CI 4.1-4.8] vs. 6.6% [95% CI 6.1-7.2]), and among White (3.4% [95% CI 3.2-3.7] vs. 5.5% [95% CI 5.1-6.0]) and Hispanic respondents (3.3% [95% CI 2.8-3.9] vs. 4.9% [95% CI 4.3-5.7]). The prevalence of suicide attempts remained unchanged among Black, American Indian/Alaska Native, and Asian/Native Hawaiian/Pacific Islander respondents. Further analysis will examine trends in attempts by additional sociodemographic variables and by mental disorders.
Discussion: Trends in suicide attempts increased overall in the United States over the last decade. This work has implications for continued efforts in the development and implementation of novel and population-based suicide prevention efforts.

5. DISTINGUISHING SUICIDES FROM UNDETERMINED DEATHS IN THE UNITED STATES: ENLIGHTENING SELF-INJURY MORTALITY MISCHARACTERIZATION AND RECONCEPTUALIZATION

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Background: The national suicide rate has risen by 32% between 2000 and 2015. This upward trend is likely a gross underestimation of the true change given the burgeoning opioid mortality epidemic, the state of medicolegal death investigation systems, and biases inherent in determining the manner of death. Without strong corroborative evidence, most notably an authenticated suicide note, suicides by drug intoxication and other poisoning (mechanism/cause) are more susceptible to classification as accidental (unintentional) or undetermined. This contrasts with suicides using firearms (mechanism/cause) or hanging/suffocation (mechanism/cause), given their obvious intention. "Undetermined' is the category most prone to suicide misclassification, and can be a window on misclassification within the much larger "accident" category.
Methods: This multilevel, multivariable study evaluated questions concerning death investigation characteristics, death circumstances, and demographics and respective associations with a suicide versus an undetermined classification. Analyses used a generalized linear mixed model (GLMM) with a county level random intercept. Individual-level data were extracted from the National Violent Death Reporting System (NVDRS) Restricted Access Data for the period 2011-2013, supplemented by county-level data on chief medical examiner/coroner selection, accreditation status/type of investigation system, urbanicity, and poverty burden. Predictors included injury mechanism/cause, "suicide" note, autopsy, prior suicide attempt, and mental diagnosis. Among other covariates were current mental health treatment; blood alcohol concentration; and number of other specified drug positives. The study population comprised registered suicides (ICD-10: U03, X60-X84, Y87.0) and undetermined intent deaths (ICD-10 Y10-Y34 and Y87.2, Y89.9) with known state and county of death, and was further confined to decedents aged 15 years and older. Decedents totaled 32,151.
Results: Affirming hypotheses, combined firearm and suffocation cases were more likely than drug intoxication and other poisoning cases to be classified as suicide [Adjusted Odds Ratio (AOR) 36.23 95%CI 30.45, 43.11], as were cases with an evidentiary suicide note [AOR 34.60 95%CI 26.60, 44.84] versus cases with no note or unknown note status, and cases with documentation of a prior suicide attempt (AOR 2.40 95%CI 2.09, 2.74), or a primary diagnosis of depression (AOR 1.60 95%CI 1.37, 1.87) or bipolar disorder [AOR 1.42

95%CI 1.12, 1.83] versus those with no documented mental disorder. Stratification of cases by injury mechanism/cause intensified the association between an evidentiary note and a suicide versus undetermined classification for poisoning cases [AOR: 41.4 95%CI 29.27, 59.81]. Documentation of a prior suicide attempt and a depression or bipolar disorder diagnosis were both associated with a suicide classification in poisoning but not firearm/suffocation cases.
Discussion: Results highlight problems that data deficits pose for valid drug intoxication and other poisoning suicide case ascertainment, and thus for surveillance, etiology, and prevention, and evaluation of mental health interventions. Without evidence from psychiatric records or psychological autopsies, decisions about the intent of poisoning or intoxication are subject to biases and open to 'default decisions.' Our data underscore the need for improvements in manner-of-death determination and the NVDRS domain. They support an enhanced working category of self-injury mortality, which transcends registered suicides through incorporating deaths from drug self-intoxication (DDSI) based on tangible evidence.

6. Withdrawn

MOVING "UPSTREAM" TO PREVENT SUICIDE

Chair: Rajeev Ramchand, RAND Corporation

1. LESSONS LEARNED FROM SUICIDE PREVENTION AT SCHOOL

José Santos*[1], Rosa Simões[2], Maria Erse[2], Jorge Façanha[2], Lúcia Marques[3], Cândida Loureiro[4], Ermelinda Matos[3], Helena Quaresma[4]

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Background: Mental health promotion and suicide prevention in schools continue to be an object of study. Despite the importance of school as a place of intervention, studies with methodological robustness that confirm the effectiveness of such measures are scarce (Santos et al., 2013).
Methods: The +Contigo project is a multilevel program that contributes to increasing knowledge about mental health and suicidal behaviors and improving skills to identify and refer risk situations. It involves both the education community (parents and tutors/guardians, education agents, and students) and health professionals from the area of intervention.
A specialized intervention aimed at adolescents is conducted throughout the academic year, using socio-therapeutic games focused on mental health stigma, adolescence, physical and mental well-being, self-concept, depression, and problem-solving strategies. The intervention is assessed in two moments: a 1st assessment (diagnostic evaluation) - before the intervention, and a 2nd assessment six months after the intervention. In the latter assessment, a questionnaire including several scales is used for assessing variables such as well-being, coping skills, self-concept, and depression among experimental and control group (Santos et al., 2014).
Results: The intervention was implemented during a period of five years i n 11,326 Portuguese adolescents, with a mean age of 13 years. About 20% of them reported feelings of depression; girls showed lower levels of self-esteem and well-being, less coping skills, and higher levels of depression than boys. Throughout the intervention, the adolescents reported lower levels of depression (2012-2016), higher levels of well-being (2012, 2013) and self-concept (2014), and more coping skills (2016) when compared to the control group.

Discussion: The high prevalence of depression, the severe impact on the adolescents' physical and mental well-being, and the strong association between depression and suicidal behaviors require the development of a strategy for early detection and adequate treatment and follow-up.
Schools play a vital role in mental health promotion; hence, more investment should be made in prevention, but also in interventions and referral to mental health care.
Therefore, programs should be designed for the prevention of depression and suicidal behaviors in schools by identifying and assessing depression and implementing prevention strategies. These strategies will allow increasing personal skills, self-esteem, problem-solving skills, and help-seeking behaviors, thus reducing risk factors and increasing protective factors. This study emphasizes the need to increase the number of mental health professionals in schools and promote their training, as well as the need to promote mental health literacy among the education community (teachers, parents/guardians, and students) to enable them to identify the signs and symptoms of depression and the risk factors associated with suicidal behaviors, and provide a timely and effective response.

2. GOOD BEHAVIOR GAME AS A POPULATION-BASED APPROACH FOR PREVENTION

Holly Wilcox*[1], Nicholas Ialongo[1], Sheppard Kellam[1]

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Background: The Good Behavior Game (GBG) is a team-based classroom behavior management strategy that helps young children master the role of student while developing the discipline needed to sit still, pay attention and complete their school work. GBG is built around four core elements that integrate classroom rules, team membership, monitoring of behavior and positive reinforcement to individuals and the group.
Methods: The design was epidemiologically based, with randomization at the school and classroom levels and balancing of children across classrooms. The trial involved a cohort of first-grade children in 19 schools and 41 classrooms with intervention at first and second grades followed until age 22. Replication was implemented with the next cohort of first grade children with the same teachers but with little mentoring or monitoring.
Results: GBG has been proven to reduce aggressive, disruptive behavior and increase on-task behavior for students by the end of first and second grades. In our classroom-based randomized trial with follow-up until age 22, the results show that first graders assigned to GBG classrooms experienced half the lifetime rates of ideation and attempts as compared to their matched controls when implementation supports were in place (i.e., mentoring and monitoring of teachers implementing the GBG). The GBG has been cited in the National Strategy for Suicide Prevention as an example of a universal classroom behavior management method that has shown to contribute to the prevention of suicidal ideation and suicide attempts, as well as other outcomes. The Washington State Institute for Public Policy developed a standardized model using scientifically rigorous standards to estimate the costs and benefits associated with various prevention programs. The benefit-per-dollar for GBG was more than $64 for every dollar invested.
Discussion: A universal preventive intervention directed at socializing children and classroom behavior management to reduce aggressive, disruptive behavior may delay or prevent onset of suicide ideation and attempts. The GBG must be implemented with precision and continuing support of teachers. We will discuss who benefits from the GBG and under what conditions.

3. SUICIDE PREVENTION STRATEGIES IN LAW ENFORCEMENT: APPROACHES IN THE UNITED STATES, UNITED KINGDOM, ISRAEL, AUSTRALIA, AND CANADA

Rajeev Ramchand*[1], Lucy Strang[2], Virginia Kotzias[1], Jessica Saunders[1], Elizabeth Thornton[1], Karen Osilla[1], Patricia Ebener[1]

[1]RAND Corporation, [2]RAND Europe

Background: Suicide among law enforcement personnel has received increased global attention, and many law enforcement agencies have adopted policies, procedure, and programs to prevent suicide in their agencies. We conducted an environmental scan of such programs across the United States, United Kingdom, Israel, Australia, and Canada to identify the range of programs offered.

Methods: We conducted semi-structured interviews with representatives from 108 US law enforcement agencies chosen to reflect variation in agency size, structure, geography, and urbanity. We also interviewed 23 agencies in non-US countries: 11 in the UK; 7 in Canada; 4 in Australia; and one in Israel. There were also significant variations in the characteristics of these non-US agencies. All interviews were transcribed and coded.

Results: In the US, the most common suicide prevention strategy offered by law enforcement agencies was formal mental health care, offered by a total of 90 of 108 agencies we interviewed. Larger agencies tended to offer services in-house, whereas many agencies contracted directly with an Employee Assistance Program (EAP). While such programs were considered by many to be a first-line of defense against suicide, many interviewees suggested that officers may be concerned about the privacy of in-house care, even when such care was completely confidential. On the other hand, interviewees suggested that a lack of cultural competency about law enforcement may impede some officers from accessing external care. Interviewees told us that their newer and younger officers were more readily accepting of mental health care and were more willing to disclose that they were receiving some type of care.

In addition to mental health care, the next most commonly offered program was crisis response (offered by 68 agencies), many of which used the critical incident stress debriefing training. Next most frequently was peer support (N=62), screening (N=60), training (N=58), chaplains (N=52), and educational materials (N=35).

All programs were extremely common outside of the US: most agencies provided formal mental health care, training, critical incident or crisis response programs, screening (particularly for roles deemed to be high-risk), and peer support programs. Less frequent but still common were educational materials, chaplains, and support during disciplinary proceedings or internal investigations.

Discussion: Law enforcement agencies worldwide are implementing programs to prevent suicide and address mental health issues in their workforce. Counseling was commonly available to officers, either through on-staff counselors but more typically external providers, although the utilization rate of this provision was unclear. Outside of formal mental health care, few programs are informed by science, even fewer have been evaluated or are being evaluated, and some (particularly those that occur after a crisis) may be contraindicated. Efforts are needed to promote strategies for facilitating access to quality mental health care and to ensure the care offered in-house and by contracted providers is culturally competent and of high quality. Research is needed to evaluate the utility of other programs adopted by law enforcement, and clarification is needed to ensure proper care is administered to officers after crisis situations.

4. A PILOT STUDY OF WHOLE HEALTH COACHING: A STRENGTHS-BASED APPROACH TO ENHANCE SUICIDE PREVENTION

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Background: Whole Health Coaching is a strengths-based, solutions-focused modality that seeks to optimize overall well-being. Health coaches help people focus on goals, identify strengths and values, and work towards building the kind of life they wish to live. Coaching is especially helpful for individuals going through life transitions, and it can positively impact psychological well-being as well as disease-specific outcomes. No prior studies have examined the use of coaching among patients at risk for suicide. The main purpose of this pilot study was to examine the feasibility and acceptability of Whole Health Coaching among recently returning military veterans with recent suicidal ideation.
Methods: This is a mixed-methods, single-arm, repeated-measures feasibility and acceptability pilot trial. We enrolled 22 recently returning veterans (served in Iraq and Afghanistan conflicts) with recent suicidal ideation (past 3 months) to participate in eight coaching sessions over ten weeks. The Whole Health Coaching intervention consists of four steps: 1) Articulate mission and purpose in life, 2) Self-assessment over eight life domains, 3) Articulate goals and action steps, and 4) Evaluate action, re-assess, and re-plan as needed. To examine feasibility and acceptability, we tracked enrollment conversion rates (number of eligible veterans contacted vs. number enrolled), intervention completion rates (completing ≥5 sessions), and conducted qualitative interviews with participants at the end of the intervention to gather feedback on their experiences with coaching and perceived benefit. To inform sample size calculations for a future randomized controlled trial, participants also completed surveys at baseline, four, eight, and 16 weeks, including measures of psychological well-being and suicidal ideation.
Results: Participants were 82% male, 68% white, 32% married, and 77% heterosexual. We achieved a 43% enrollment rate and 84% of participants have completed the intervention. Participants felt the coaching program has helped them achieve their goals and enabled them to feel confident addressing concerns in their life. Emerging themes in qualitative analyses include: several aspects of coaching reinforce psychological well-being, patients select very personally-relevant goals to discuss with their coach, coaching is different than other care they receive, and coaching helped them regain a sense of purpose.
Discussion: This feasibility and acceptability pilot trial found that veterans with suicidal ideation are very interested in participating in Whole Health Coaching and find it extremely beneficial. Findings suggest a larger randomized controlled trial is warranted to examine effectiveness of the intervention in reducing suicidal ideation and enhancing psychological well-being. Overall, Whole Health Coaching shows promise as a strengths-based approach to enhance current suicide prevention efforts.

5. PACK SIZE RESTRICTION OF NON-OPIOID ANALGESICS SOLD OVER-THE-COUNTER IN DANISH PHARMACIES; A NATIONAL REGISTER STUDY INVESTIGATING THE TREND IN POISONINGS BEFORE AND AFTER THE AMENDMENT

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Background: Paracetamol is reported to be the most frequently used drug for overdoses in European countries. An international concern has emerged and interventions, such as age and pack size restriction of non-opioid analgesics sold OTC in pharmacies, have been implemented. However, effects of pack size restrictions remain unexamined in several countries.
Methods: A nationwide register study investigating the trend in hospital admissions for non-opioid analgesic poisonings before and after the implementation of age and pack size restriction in Denmark in 2011 and 2013, respectively. Specific outcomes of interest were IDC-10 codes for non-opioid analgesic poisonings (T39 and X60), other poisonings (T38, T41-T50, X61, X63, X84), and violent methods (X70-X84) registered in the National Patient Register and the Psychiatric Central Research Register. Analysis of interrupted time series analysis in the period 2002 to 2015 was performed.
Results: Preliminary analysis showed a significant estimated slope difference in numbers of T39 codes after the age restriction in 2011 -2.328 (95 % CI -3.844 to -0.811). The estimated level change after the pack size restriction in 2013 was -38.839 (95% CI -77.521 to -0.157). Analysis of level change of all other poisonings also showed a significant decrease after 2011. This was a global trend across all drug poisonings unrelated to the interventions. We found a non-significant increase in the use of violent methods for self-harm, not supporting a shift in methods. (Estimates of changes in poison severity based on blood samples will be available in Nevada 2017).
Discussion: A significant reduction in numbers of hospital contacts for poisoning by non-opioid analgesics was observed after the legislative changes in Denmark. Evidence is provided for pack size restriction of non-opioid analgesics in pharmacies as an effective means restriction strategy.

6. DECISION TOOLS TO INFORM CURRENT SUICIDE PREVENTION INITIATIVES IN AUSTRALIA

Andrew Page*[1], Jo-An Atkinson[2], Mark Heffernan[3], Geoff McDonnell[2], Ian Hickie[4]

[1]Western Sydney University, [2]The Australian Prevention Partnership Centre, The Sax Institute, [3]Dynamic Operations, [4]Brain and Mind Centre, University of Sydney

Background: Dynamic simulation modelling is increasingly being recognised as a valuable decision support tool to help guide investments and actions to address complex public health problems such as suicide. Such models allow policy makers and their stakeholders to ask 'what if' questions; exploring for specific geographic contexts or sub-populations the likely impacts of different combinations of policies and interventions before they are implemented in the real world. This presentation reports on recent trends in Australian suicide, the current suicide prevention policy context including suicide prevention initiatives, and the development of a surveillance and simulation system to evaluate policy responses.
Methods: We developed a system dynamics model for suicide prevention in Australia, and investigated the hypothesised impacts over the next 10 years (2015–2025) of a combination of current intervention strategies that have been proposed for funded population interventions in Australia: 1) general practitioner (GP) training, 2) coordinated aftercare in those who have attempted suicide, 3) school-based mental health literacy programs, 4) brief-contact interventions in hospital settings, and 5) psychosocial treatment approaches.
Results: Findings suggest that the largest reductions in suicide were associated with GP training (6%) and coordinated aftercare approaches (4%), with total reductions of 12% for all

interventions combined. Importantly, findings suggest that intervention effects of single interventions are not additive, and that proposed national targets in suicide reduction will not be met with this combination of interventions.
Discussion: This presentation highlights the value of dynamic modelling methods for managing complexity and uncertainty, and demonstrates its potential utility as a decision support tool for policy makers and program planners for community suicide prevention actions. This modelling approach can be used as an adjunct to the prospective use of traditional epidemiological and program evaluation methods, and can help policy makers learn more quickly what works, why, and for whom when planning program interventions. Engaging stakeholders in the development and use of these decision support tools can facilitate cross-disciplinary communication, advance contentious debates, improve transparency in decision making and build consensus for action.

THE ROLE OF MEDIA & SOCIAL MEDIA IN SUICIDE AND ITS PREVENTION

Chair: Paul Yip, The University of Hong Kong

1. THE ROLE OF MEDIA IN PREVENTING STUDENT SUICIDES: A HONG KONG EXPERIENCE

Paul Yip*[1]

[1]The University of Hong Kong

Background: There was a surge of student suicides in March 2016 in Hong Kong with nearly 80% of increase, a large-scale media engagement was implemented aiming to minimize copycat effects but spread out more preventive information.
Methods: Student suicide intensity was compared to overall suicides and youth suicides since 2003 to examine the trend differences. Media engagement's impacts were examined by the intensity changes of different types of news reporting, and comparing changes with student suicide incident intensity. Local polynomial smoothing method was used to estimate the intensities.
Results: Student suicide intensity has been slowly increasing since 2006 and reached a sharp peak between January and March 2016. There was a great drop afterwards, but another increase appeared by the end of 2016. The trend was contrast to the decreasing trend of overall suicide intensity. Before our media engagement, student suicide news reporting was more intensive and most content was descriptive. After engagement, descriptive reporting intensity sharply dropped and have remained low since then, whereas preventive reporting intensity increased sharply in March and April 2016 but dropped back to normal afterwards.
Discussion: The recent surge of student suicide in Hong Kong was statistically abnormal. The media engagement seems to have changed local suicide news reporting to more preventive, which might have contributed to the drop of student suicide.

2. DID THE SUICIDE BARRIER WORK AFTER ALL? REVISITING THE BLOOR VIADUCT NATURAL EXPERIMENT, ITS IMPACT ON SUICIDE RATES IN TORONTO AND THE EFFECT OF THE MEDIA

Mark Sinyor*[1], Ayal Schaffer[2], Donald Redelmeier[3], Alex Kiss[4], Yasunori Nishikawa[5], Amy Cheung[1], Anthony Levitt[2], Jane Pirkis[6]

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Sciences, [4]Sunnybrook Research Institute, [5]Sunnybrook Health Sciences Centre, [6]University of Melbourne

Background: A suicide barrier at the Bloor Street Viaduct in Toronto constructed in 2003 resulted in no short-term change in rates of suicide-by-jumping due largely to site substitution, but other factors such as media effects have not been examined. The long-term impact of the barrier and the relationship to associated media reporting is unknown.
Methods: This before-and-after study compares suicide rates derived from coroner's records for the 11 years prior to and after completion of the barrier (1993-2003 vs. 2004-2014). It also examines a database of print and online media reports on suicide-by-jumping to identify whether volume or content had any impact on suicide deaths. Poisson regression analyses were used for both sets of before-and-after analyses.
Results: Suicide rates at the Bloor Street Viaduct declined from 9.0 deaths/yr before the barrier to 0.1 deaths/yr after the barrier (IRR 0.005, 95%CI 0.0005-0.19, p=0.002). Suicide deaths from bridges in Toronto also declined significantly (IRR 0.53 95%CI 0.40-0.71, p<0.0001). Media reports about suicide at the Bloor Street Viaduct were associated with an increase in suicide-by-jumping from bridges the following year.
Discussion: This study demonstrates that, over the long-term, suicide-by-jumping declined in Toronto after the barrier with no associated increase in suicide by other means. That is, the barrier appears to have had its intended impact at preventing suicide despite a short-term rise in deaths at other bridges that was at least partially influenced by a media effect. Research examining barriers at other locations should interpret short-term results with caution.

3. DO THE MASS MEDIA IN INDIA REPORT ON SUICIDE IN ACCORDANCE WITH WORLD HEALTH ORGANIZATION MEDIA REPORTING GUIDELINES? A CONTENT ANALYSIS STUDY OF NINE MAJOR NEWSPAPERS IN TAMIL NADU, INDIA

Gregory Armstrong*[1], Lakshmi Vijayakumar[2], Thomas Niederkrotenthaler[3], Mala Jayaseelan[2], Ramya Kannan[4], Anthony Jorm[1], Jane Pirkis[1]

[1]Centre for Mental Health, The University of Melbourne, [2]Voluntary Health Services, Chennai, India, [3]Medical University of Vienna, Center for Public Health, Institute for Social Medicine, Suicide Research Unit, [4]The Hindu, Chennai, India

Background: Suicide rates in India are among the highest in the world with an estimated suicide death rate of 21 deaths per 100,000 population, resulting in over 258,000 suicide deaths annually. Tamil Nadu, which lies in the southernmost part of the Indian Peninsula, is the sixth most populous state with a population of 72 million and it consistently has one of the highest suicide rates in the country. How the media communicates with the Indian public on the topic of suicide has thus far gone without sufficient scrutiny. With attempted suicide being a criminal offence in India until 2017, it is crime journalists who have typically undertaken much of the reporting of suicide-related news. The objective of our study was to assess compliance against international suicide reporting guidelines in the most highly read daily newspapers in Tamil Nadu.
Methods: We used content analysis to assess compliance against World Health Organisation (WHO) media guidelines in the nine most highly read vernacular and English-language daily newspapers in Tamil Nadu over the 7-month period between June-December 2016. Five of the nine newspapers under review are in the top 20 most circulated daily newspapers in the country, indicating that the findings have relevance beyond Tamil Nadu. All publications from these newspapers were hand searched for articles reporting on suicide death, attempt or

ideation incidents, as well as articles containing general commentary on the topic of suicide. Data were extracted from each article using a comprehensive coding frame. A high degree of inter-rater agreement was achieved during pilot testing and on a sub-sample of the articles collected for the study.
Results: A total of 1,681 suicide articles were retrieved, with a relatively short average length of just 11.6 sentences. The vast majority (97.7%) of the articles included reports of suicide incidents (i.e. death, attempt or ideation), and a sizeable proportion presented news on homicide-suicide incidents (9.3%) and suicide pacts (12.4%). Only 4.1% of articles contained general commentary on the issue of suicide. The mean number of suicide articles per day per paper was 0.9 (range: 2.3 to 0.5), and 25.1% of these were published on the first 4 pages. There were several common features in the articles that were not consistent with WHO guidelines. A suicide method was almost always reported (92.7%) and in 43.3% of articles a detailed suicide method (i.e. at least two consecutive steps) was given. Headlines frequently identified a suicide method (39.8%) as well as recent life events (39.3%). Monocausal explanations for a suicide incident were a feature in 53.4% of articles and photos of suicidal persons were also relatively common (21.7%). The connection between mental health problems (7.5%) or drug/alcohol abuse (4.4%) and suicidality was rarely made and opinions from health professionals (1.1%) were almost never a feature of these articles. Just 3.5% of articles mentioned a suicide prevention program/service and only 2.5% gave specific contact details for a suicide support service such as a hotline.
Discussion: We observed that a daily diet of short, graphic and simplistic suicide-related news was served up to readers of newspapers in Tamil Nadu. Further research is needed to examine the impact of this reporting on suicide rates and community beliefs and attitudes around suicide prevention. Attempts should also be made to better understand the perspectives and experiences of media professionals in India who report on suicide-related news in order to inform efforts to engage the media in improving their reporting approach.

4. THE IMPACT OF AN AFTERCARE MOBILE TEXT MESSAGING INTERVENTION ON MENTAL HEALTH SYMPTOMS AMONG YOUTH IN RECOVERY FROM SUBSTANCE USE DISORDERS

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Background: There is limited research on the impact of aftercare interventions designed for addressing substance use relapse outcomes on improving psychological impairment. This study reports on the impact of a 12-week mobile text messaging aftercare intervention on mental health symptoms of young people transitioning into recovery from substance use disorders.
Methods: A total of 80 youth (Mage = 20.7, SD = 3.50) who completed treatment for substance use disorders from community-based treatment programs were randomly assigned to either a mobile texting aftercare intervention or an aftercare as usual control group (40 per condition). The mobile texting intervention is based on a disease management wellness theoretical framework that promotes participation in goal-directed lifestyle change and self-management of problematic mood and substance use behaviors.
Results: Youth participants who received the mobile intervention reported significantly less psychological symptoms ($p<.001$) on the Global Appraisal of Needs (GAIN) than the participants in the aftercare as usual control group from baseline to discharge, and at a 3-month follow-up. Results showed that youth who had more motivation to change were

significantly more likely to experience reduced psychological impairment than youth who were less motivated to change over time ($p<.05$).
Discussion: Findings suggest that the mobile texting aftercare intervention can be an effective approach for promoting healthy recovery from substance use disorders among youth.

5. TEXT-MESSAGING INTERVENTION TO EXTEND SCHOOL-BASED UNIVERSAL SUICIDE PREVENTION

Anthony Pisani*[1], Peter Wyman[1], Carolyn Anderson[1], Emily Judd[1], Karen Schmeelk-Cone[1]

[1]University of Rochester

Background: School-based universal prevention programs show promise for reducing youth suicide (Schilling et al., 2015, Wyman et al, 2010). Help-seeking behaviors, youth-adult connectedness, and strategies for emotion regulation are promising targets (Wyman et al, 2010; Pisani et al., 2013). However, reaching a diverse array of young students with intervention content is a challenge.
This challenge might be overcome by using text messaging to reinforce and extend school-based suicide prevention. Studies of texting interventions delivered to indicated populations show promise, but few focus on youth in the general population. To our knowledge, texting has not yet been used to extend a universal school-based intervention nor to engage internal and social protective factors for suicide prevention.
We field tested Text4Strength, an automated text messaging intervention. Text4Strength extends Sources of Strength (Wyman, 2010), an evidence-based peer network intervention for schools. Text4Strength uses text- and video-based testimonials from school peer leaders to encourage help-seeking, youth-adult connectedness, and strategies for emotion self-regulation.
We examined the degree to which students: (1) replied to texts; (2) viewed videos sent via links; and (3) judged the messages as fun, relevant, and useful.
Methods: 42 students (30 female, 12 male) drawn from two rural high schools received texts and videos for three months. We tracked students' text reply rates, click-through rates on links to videos, and viewing completion rates. Surveys given before and after the intervention measured demographics, depression, social isolation, distress and anxiety, help-seeking from adults, emotion regulation, and friendship connections. A follow-up survey asked about the usefulness of the texts, the experience of interacting with the texting computer, technical difficulties, and the appeal of the videos.
Results: Reply rates varied greatly (7.1%-75%) across message sequences but were uniform across the population. 92.9% of participants responded to one or more messages. 52.3% replied to at least a third of sequences, 31% replied to at least half, and 19% replied to two-thirds or more. On average 58.2% of students who replied to an initial text completed the sequence. Engagement with videos was lower than expected. Each video was viewed by 5%-52% of students (mean of 20%), with an average of 86% of the video viewed (range 58%-100%). Most students who started a video watched to the end.
Student rating of the texts was highly favorable. The majority of students liked them and found the system easy to use and relevant to their experience. Most students (73%-97%) agreed or strongly agreed that interacting with texts was fun and useful. Students' ratings of usefulness were unrelated to their response rate—the top and bottom third of repliers rated the messages equally useful.

Discussion: The intervention was found to be feasible and appealing. Two surprising results can inform future texting interventions. 1) Students found texts useful whether or not they replied often, suggesting they saw them as invitations to interact when an interest or need arose. Understanding this attitude can help us set realistic expectations about participation and adjust content so that modest use results in sufficient exposure. 2) Few students watched the videos. Students reported being limited by time, location, and bandwidth/capability. Text messaging is an on-the-go medium but videos require you to stop and watch. Future universal texting intervention should carefully weigh the cost and value of producing videos. After revision based on findings and student feedback, we launched an RCT that will be completed in 2017.

6. SMARTPHONE APPLICATIONS FOR SUICIDE PREVENTION: EVIDENCE-BASED OR EVIDENCE-INFORMED?

Mark Larsen[1], Jennifer Nicholas[1], Helen Christensen[1], Bill Reda*[1]

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Background: There has been a rapid growth in the use of new technologies such as mobile health applications (apps) to help identify and support those at risk of suicide. Despite the large number of apps publicly available through the app stores there is a lack of evidence regarding their effectiveness at reducing suicidal behaviours, or indeed whether they may be harmful. To determine if apps are at least evidence-informed, we sought to assess the concordance of features in publicly available apps with current scientific evidence of effective suicide prevention strategies.
Methods: Apps referring to suicide or deliberate self-harm were identified on the Android and iOS app stores. Systematic review methods were employed to screen apps based on their titles and descriptions, and relevant apps were downloaded for full content review. App features were labelled using a coding scheme reflecting the broad range of evidence-based medical and population-based suicide prevention interventions. Best-practice for suicide prevention was based upon a World Health Organization report and supplemented by other reviews of the literature.
Results: One hundred and twenty-three apps referring to suicide were identified and downloaded for full review, 49 of which were found to contain at least one interactive suicide prevention feature. Most apps focused on obtaining support from friends and family (n = 27) and safety planning (n = 14). Of the different suicide prevention strategies contained within the apps, the strongest evidence in the literature was found for facilitating access to crisis support (n = 13). All reviewed apps contained at least one strategy that was broadly consistent with the evidence base or best-practice guidelines. Apps tended to focus on a single suicide prevention strategy (mean = 1.1), although safety plan apps provided the opportunity to provide a greater number of techniques (mean = 3.9). Potentially harmful content, such as listing lethal access to means or encouraging risky behaviour in a crisis, was also identified.
Discussion: Many suicide prevention apps are available, some of which provide elements of best practice, but none that provide comprehensive evidence-based support. Apps with potentially harmful content were also identified. Despite the number of apps available, and their varied purposes, there is a clear need to develop useful, pragmatic, and multi-faceted mobile resources for this population. Clinicians should be wary in recommending apps, especially as potentially harmful content can be presented as helpful. Currently safety plan apps are the most comprehensive and evidence-informed.

Wednesday, November 8, 2017

CHALLENGES AND SOLUTIONS IN PSYCHOSOCIAL INTERVENTIONS RESEARCH

Chair: Yeates Conwell, University of Rochester School of Medicine

1. A PSYCHOMETRIC EVALUATION OF THE CAMS RATING SCALE

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Background: An important methodological consideration when studying interventions is the role of fidelity, or the extent to which treatments being compared with randomized controlled trials (RCT's) are both distinct and delivered as intended. Without adequate assessment of fidelity, the ability to draw valid conclusions about the effects of interventions on outcomes is significantly hindered (Kazdin, 2003). Direct observation has been posited as an accurate method of ensuring that providers in different treatment conditions are delivering distinctly different interventions as prescribed (Bellg et al., 2004; Lane et al., 2004; Smith et al., 2007). Moreover, an effective methodology for satisfying direct observation criteria is the application of a measure that can be used to rate clinician performance with regard to specific components of a particular intervention. To date, however, there does not exist any literature describing the psychometric properties of a suicide-specific treatment fidelity measure. Thus, the goal of the current study is to evaluate a measure that can be used to assess fidelity when studying the "Collaborative Assessment and Management of Suicidality" (CAMS).
Methods: Data for the current study were collected between September 2012 and March 2016 as part of a randomized controlled trial at a U.S. Army installation at Ft. Stewart in Georgia. Clinicians in the trial delivered either CAMS or "Enhanced Care-As-Usual" (E-CAU) to suicidal Soldiers. Study sessions were videotaped and viewed by study personnel, who rated the performance of each clinician using the "CAMS Rating Scale" (CRS). These ratings were then used to evaluate the internal consistency of the CRS. Factor analyses were also run to elucidate the measure's latent variable structure, and a generalizability study was conducted to determine the contributions of variance from different components of the measurement model.
Results: Cronbach's alpha coefficients for different subscales of the CRS ranged from 0.859 to 0.977, suggesting that the measure demonstrates high internal consistency. Additionally, goodness-of-fit statistics (i.e., RMR: 0.042; CFI: 1.000; TFI: 1.004; RMSEA: < 0.001) in conjunction with factor loadings ranging from 0.861 to 0.987 suggest a strong fit between the data and a two-factor model that differentiates essential from non-essential CAMS components. Results of the generalizability study indicated that variance in the measurement model stems primarily from expected sources (i.e., different treatment groups). More specifically, the interaction between CRS items and different treatment groups accounted for 31.5% of the variance, and clinicians from different treatment groups accounted for 29.2% of the variance. Additionally, different raters accounted for less than 0.1% of the variance in the measurement model, which suggests that the CRS demonstrates high inter-rater reliability. Also notable is a generalizability coefficient of 0.97, which suggests that the CRS can reliably differentiate CAMS from another treatment (i.e., E-CAU).
Discussion: Analyses revealed that the CRS is a reliable measure that can play an integral role in demonstrating treatment fidelity within RCT's evaluating CAMS. While the results of

the factor analyses do not statistically support the organization of the CRS into its current subscales, a latent variable model was identified that differentiates essential from non-essential CAMS items. The measure also demonstrated high internal consistency, and a generalizability study underscored two important characteristics of the CRS: its ability to reliably differentiate CAMS from another treatment (i.e., E-CAU), and its demonstration of high inter-rater reliability.

2. A RANDOMIZED CLINICAL TRIAL OF COLLABORATIVE ASSESSMENT AND MANAGEMENT OF SUICIDALITY (CAMS) VERSUS TREATMENT AS USUAL (TAU) FOR SUICIDAL COLLEGE STUDENTS

Jacqueline Pistorello*[1], David Jobes[2], Scott Compton[3], Robert Gallop[4], Nadia Locey[1], Josephine Au[2], Samantha Noose[1], Joseph Walloch[1], Tami Jeffcoat[1], Jacquelyn Johnson[1], Maria Young[1], Yani Dickens[1], Patricia Chatham[1]

[1]University of Nevada, Reno, [2]The Catholic University of America, [3]Duke University, [4]West Chester University

Background: Suicide is the second leading cause of death on college campuses (Suicide Prevention Resource Center, 2004). College counseling centers are the front line for treating suicidal students (Kay & Schwartz, 2010), but are often overwhelmed with extensive waitlists (Gallagher, 2012). Not all suicidal college students demonstrate the same level of risk or respond uniformly to treatment (Jobes, Jacoby, Cimbolic, & Hustead, 1997), but there is no established guidance as to how CCCs can best utilize their limited resources with suicidal students (Lamis & Lester, 2011).
Methods: As part of a larger study piloting personalized adaptive treatment strategies (Marlowe et al., 2008) described extensively elsewhere (Pistorello et a., under review), 62 suicidal college students were randomly assigned to Collaborative Assessment and Management of Suicidality (CAMS; Jobes 2006, 2016) – a suicide-focused, theoretically agnostic and flexible framework – or to a treatment as usual (TAU) condition. Treatment lasted between 4 and 8 weeks (mean=6.76 sessions, SD =2.32) and it represented a first line approach to addressing suicidal risk among college students. Prior to each session, participants completed the Counseling Center Assessment of Psychological Symptoms (CCAPS-34; Locke et al., 2012) which includes depression and overall distress subscales, as well as a question on suicidal ideation, and, after each session, therapists completed Clinical Global Impression ratings – Improvement and Severity (CGI, Guy, 1976). Additionally, participants were assessed at baseline and at post (approximately 8 weeks after baseline) utilizing the following measures: Scale for Suicide Ideation—Current (SSI; Beck, Kovacs, & Weissman, 1979), Beck Hopelessness Scale (BHS; Beck, Weissman, Lester & Trexler, 1974), Suicide Attempt and Self-Injury Count (SASI-C; Linehan & Comtois, 1996), and the Personality Assessment Inventory – Borderline Features Scale (PAI-BOR; Morey, 1991).
Results: Significant findings, favoring CAMS, were found in the weekly self-report measure: CAMS resulted in greater reductions in depression: HLM indicated a significant differential rate of change on the CCAPS-Depression from baseline through end of stage 1, $t(60) = 2.15$, $p = 0.035$, controlling for intake depression score and baseline distress level. HGLM also indicated a significant differential rate of change on the CCAPS-Suicidal Ideation question from baseline through end of stage 1, $t(60) = 2.01$, $p = 0.049$. Participants in both arms showed significant improvement in suicidal risk measured via interview and hopelessness, but there were no condition differences on these measures. However, whereas CAMS resulted in more improvement in hopelessness among participants who scored lower on

borderline personality disorder features and had fewer than two prior suicide attempts, the opposite was true for participants in the TAU condition.
Discussion: These findings suggest that CAMS is an effective first-line approach to treating suicidal college students, particularly for those with a more acute (vs. chronic) profile. A larger sample is needed to confirm these findings.

3. SUICIDE AND BEHAVIORAL HEALTH SCREENING BY BEHAVIORAL HEALTH AGENCIES IN THE PENNSYLVANIA STUDENT ASSISTANCE PROGRAM

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Background: When youth are identified in Pennsylvania schools for a behavioral health concern, they are referred to the Student Assistant Program (SAP) where it is determined if they need assessment from a professional (behavioral health [BH] Liaison). Throughout the state, an estimated 75 agencies provide all of the behavioral health assessments for the entire state public school system. Introducing a web-based screening tool into all of these organizations would change the way assessment and triage are conducted. In the academic year 2013-14, 17,731 students were assessed. Of those assessed, 14.23% were determined to have a primary problem of drug and alcohol use while 77.14% were determined to have a primary problem related to mental health issues. Surprisingly, however, only 7.71% were identified as having suicide ideation or having made a suicide attempt. These rates seem low given the relatively high-risk profile of the group, indicating a possible lack of training and/or effective screening in the SAP system. Given the prevalence rates of suicide ideation and attempts in the general school population (14.5% ideation, 6.9% attempt history), the SAP system is under-identifying youth at risk for suicide. With the introduction of gatekeeper training and standardized screening, we intend to increase identification rates and triage of potentially suicidal youth in need of services.
Methods: Since the 2015-16, we have provided SAP liaison agencies across 20 counties in the state with web-based suicide and behavioral health screening through implementation and integration of our BH-Works program to utilize within the SAP system. The BH-Works program consists of provider education, web-based screening, and assistance with building a stronger behavioral health "neighborhood." At the core of BH-Works is the Behavioral Health Screening (BHS) tool. Designed for use in a variety of medical and non-medical settings, the BHS is administered electronically in 7 to 10 minutes and scored instantly, screening for psychiatric symptoms and risk behaviors across 13 domains, including suicide, anxiety, depression, psychosis, eating, bullying, trauma, abuse, sexuality, substance use, safety, school, and family. We trained these mental health and substance abuse providers to use the screening tool and deliver empirically supported interventions.
Results: More than 3000 students have been screened through SAP using the BHS since the start of the project. SAP liaison agencies now utilizing the BHS have reported that 30% of youth screened have self-reported either current or a history of suicide ideation. 47% of students have screened positive for moderate or severe depression, 57% identified with significant anxiety, 48% identified at risk for PTSD, 5% identified at risk for an eating disorder, and 7% identified at risk for a substance abuse problem.
Discussion: While SAP providers may elect to use a number of approaches in their assessment and screening, we felt that it was imperative to provide a screening tool that could gather reliable and valid data to support their use. Because the data can be aggregated, this could create a state level registry that would improve the capacity of schools and community

agencies to address the problems of at-risk youth. The success of this project lies in the fact that all the activities are embedded within existing systems. The implementation of the web based screening tool in the SAP system will have statewide impact by raising the standard of care for assessment and triage of suicidal youth. As a result of implementing the BHS, previously unidentified youth are now being identified across Pennsylvania and being referred to the appropriate behavioral health services.

4. ASSOCIATIONS OF SUICIDE PREVENTION TRAININGS WITH PRACTICES AND CONFIDENCE OF CLINICIANS AT COMMUNITY MENTAL HEALTH CENTERS

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Background: A wide range of trainings are available for behavioral health providers to improve their ability to identify and assess suicide risk as well as to provide effective interventions for individuals with suicidal thoughts and/or behavior. Whereas there is a robust field of research supporting the effectiveness of particular trainings in increasing providers' practice and confidence in engaging in these tasks, little to no research has examined the impact of multiple trainings or compared the effectiveness of trainings in the same sample. As part of the ongoing Georgia Garrett Lee Smith (GLS) grant project, entitled Georgia Suicide Safer Communities for Youth, multiple suicide prevention trainings are being provided for behavioral health providers at community mental health centers in three Georgia counties (Oconee, Newton, and Bartow) with youth suicide death rates higher than the national average between 2011-2013. This sample of behavioral health providers was used to provide inferences on the utility of a multiple trainings approach to suicide prevention training.

Methods: As part of the Georgia GLS grant, a suite of trainings are being provided to behavioral health providers at three community mental health centers. The Zero Suicide Workforce Survey, a tool to assess staff knowledge, practices, and confidence in caring for patients who are at risk for suicide, was administered electronically to 137 behavioral health providers as a baseline measure but after several trainings had already occurred. No clinician received all trainings and any trainings with less than 10 participants were not analyzed. Thus, four trainings were included in analyses: Assessing and Managing Suicide Risk (AMSR; 92 participants), Collaborative Assessment and Management of Suicidality (CAMS; 47 participants) Dialectical Behavioral Therapy (DBT; 34 participants) and Question Persuade Refer (QPR; 82 participants). Summary scores were created from questions addressing participants' practice and confidence assessing and treating suicide risk.

Results: There was a moderate association between participant's practice and confidence ($r = .60$, $p < .001$). The number of trainings in which an individual participated had a weak but significant correlation with both practice ($r = .32$, $p < .001$) and confidence ($r = .31$, $p < .001$). Individuals who attended the following trainings had significantly higher practice scores: CAMS ($p = .001$), and DBT ($p = .013$). In a multiple regression framework, CAMS explained more variance in practice scores than DBT (8.8% vs. 2.6%). Individuals who attended the following trainings had significantly higher confidence scores: AMSR ($p < .001$) and DBT ($p = .009$). In a multiple regression framework, AMSR explained more variance in confidence scores than DBT (10.6% vs. 3.5%).

Discussion: These results suggest that behavioral health providers who are confident in their skills in assessing and treating suicide risk are more likely incorporate best practices into their

clinical work. Also, it appears there is a small but significant benefit to multiple trainings for increasing both practice and confidence among providers, even though not all of the four trainings provided significant increases in practice or confidence on their own. As the GLS grant progresses and more trainings are provided, this sample will be followed longitudinally to evaluate the impact of continued trainings over a longer period.

5. 12-MONTH OUTCOMES FROM A BRIEF INTERVENTION PILOT STUDY FOR MEDICALLY HOSPITALIZED SUICIDE ATTEMPT SURVIVORS

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Background: The Teachable Moment Brief Intervention was developed to assist individuals recover after a medically serious suicide attempt. The intervention consists of 45 minutes of CAMS and DBT informed discussion that is hypothesized to lead to reduced self-directed violence by increasing motivation, hope, and reasons for living. The intervention is still in the pilot stage of clinical trial research.
Methods: Sixty-nine patients were enrolled in the study from Vanderbilt University Medical Center (VUMC) following admission for a suicide attempt. All patients were treated on a medical/surgical floor, although recruitment occurred in any setting throughout VUMC given the fast-paced nature of real-world acute care medical settings. Three patients were removed prior to assignment to a treatment condition. Seventeen patients received the TMBI as training cases for the study interventionists. Forty-eight patients were randomized to receive either the TMBI + Care as Usual (CAU; n=23) or CAU only (n=25). Interviews were scheduled for baseline (pre-randomization), 1-, 3-, and 12-month time points, and included the following repeated measures: Readiness to Change Questionnaire, Reasons for Living Inventory, Beck Scale for Suicide Ideation, Suicide Attempt Self-Injury-Count, and Interpersonal Needs Questionnaire. Patients who received the TMBI completed the Client Satisfaction Questionnaire immediately following the intervention in the hospital.
Results: Mixed effects regression analyses have been conducted for baseline, 1-, and 3-month assessments. Interestingly, while both groups had significant declines in suicidal ideation from baseline to 1-month, the control group had an even greater decrease in this outcome. However, the groups began to diverge in opposite directions between months 1 and 3, with significant group x time effects favoring the TMBI group on suicidal ideation (β = 0.73, Std. Err. = 0.11, p = 0.043), and differences approaching significance on the Readiness to Change total score (β = 5.83, Std. Err. = 3.52, p = 0.098), as well as the Action (β = 2.54, Std. Err. = 1.49, p = 0.088) and Maintenance (β = 1.94, Std. Err. = 1.14, p = 0.090) subscales. Corresponding with these outcomes was the finding that 93% of TMBI patients reported attending at least 1 mental health outpatient appointment between months 1 and 3 compared to 66% in the control group between (Fisher's Exact Test = 2.85, p = 0.15).

Likely related to these 3-month outcomes, two patients in the control group reported at the 12-month assessment having made a suicide attempt with full intent to die (one by polypharmacy overdose, one by medication overdose coupled with bleach poisoning). One of these two patients reported 10 additional polypharmacy overdoses with an ambivalent desire to die, while the other reported 1 additional polypharmacy overdose with an ambivalent desire to die. In contrast, one patient in the TMBI group reported an insulin overdose with a strong intent to upset his family and limited intent to die. This is the only suicide attempt reported by a TMBI patient. We will report the final results for the 12-month interviews,

which are scheduled to be completed in June 2017. This will include both the repeated measures, health services, and suicide attempt data.
Discussion: We will provide an update on the results of this brief intervention pilot study, which may indicate an ongoing protective effect for those patients receiving the intervention shortly after a medically serious suicide attempt. Preliminary findings in those who have completed the 12-month interview suggest fewer overall suicide attempts in the teachable moment brief intervention group.

6. EXAMINING ISSUES OF DIFFICULTY AND SAFETY CONDUCTING A MINDFULNESS-BASED INTERVENTION WITH VETERAN'S AT HIGH-RISK FOR SUICIDE

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Background: Evidence supporting mindfulness-based psychotherapies has been growing and these therapies are increasingly being utilized with populations with diverse mental health needs and symptom severity. This widespread use has prompted discourse on the safety of mindfulness-based interventions, particularly with more psychiatrically vulnerable populations. Some reports point to the emergence of mental health symptoms due to meditation practice. However, most of this literature is based on case reports and has focused on individuals attending long-term meditation retreats, rather than participating in clinically-oriented mindfulness training program. Therefore, there is a strong need to examine the safety of mindfulness-based psychotherapy provided within a clinical context. To address this issue, the present study reports on difficulty and safety associated with an intervention that combines Mindfulness-based Cognitive Therapy and Safety Planning to reduce risk among Veterans at high-risk for suicide.
Methods: Participants were at high-risk for suicide and were the first 55 randomized to receive Mindfulness-Based Cognitive Therapy for Suicide (MBCT-S) within an ongoing clinical trial. The primary outcome involved whether participants evidenced difficulty with the intervention, during the active treatment period. Sessions were coded for presence and type of difficulty with MBCT-S, based on review of MBCT-S progress notes by at least two raters (Interrater agreement 88%; $\kappa = .65$). Difficulty with MBCT-S was defined as showing evident distress, dysregulation, or agitation while participating in the intervention. Temporal association between MBCT-S and suicide events (defined as any suicide behavior or suicidal ideation requiring acute psychiatric hospitalization) was also examined by identifying cases involving a suicide event within 4 days of an MBCT-S session and reviewing all relevant case information (i.e., electronic medical record, interview information) to determine whether the event was precipitated by the intervention
Results: The vast majority of participants had a lifetime (93%) or past year (76%) suicide attempt, prior to the study. Seven (13%) participants were rated as having experienced difficulty (e.g., anxiety, agitation) during MBCT-S. None of the difficulties that emerged during MBCT-S involved suicidal ideation or behavior. Baseline comparisons showed that participants with emergent difficulty tended to report greater substance use and presented with greater diagnostic severity (TBI, psychotic symptoms). However, participants with emergent difficulty did not markedly differ in their total number of sessions attended. Five cases were identified that had a suicidal event within four days of an MBCT-S session and

one of these had experienced difficulty. In each of these five instances, case review of all available information indicated that precipitants were due illness related or stressor-related, with no evidence that suicidal events were related to MBCT-S interventions.
Discussion: This study provides initial evidence and showed that the vast majority of participants in this high-risk sample did not evidence difficulty with the intervention and that none of the difficulties involved suicidal ideation or behavior. Participants with greater clinical severity may be more likely to evidence such difficulty. While suicidal events did occur in this high-risk sample, no evidence emerged suggesting that they were precipitated by MBCT-S. Implications are discussed for the emergence of difficulty in psychotherapy with individuals at high-risk for suicide (i.e., presence of a clinician, therapeutic growth, safety).

PREVENTION IN DIVERSE SITES & POPULATIONS

Chair: Madelyn Gould, Columbia University & New York State Psychiatric Institute

1. PATIENTS' OPINIONS OF SUICIDE RISK SCREENING IN A PEDIATRIC PRIMARY CARE CLINIC

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Background: Youth suicide is an international public health threat. According to the World Health Organization and the Centers for Disease Control and Prevention, suicide was recently ranked as the second leading cause of death for youth worldwide (WHO, 2014; CDC, 2014). The majority of youth who have died by suicide had been in contact with a medical professional within the 3 months period preceding death (e.g., Rhodes, 2013); 90% of youth with suicidal ideation, plan or intent were seen by a primary care provider within the previous year (McCarty et al., 2011). Thus, the primary care setting is a critical location for early detection and intervention.
The Joint Commission recently released a recommendation for universal suicide risk screening across all health care settings, including primary care clinics (Joint Commission, 2016). While there are data on suicide risk screening with pediatric patients on medical inpatient units (Ross et al, 2016) and the emergency department (Ballard et al., 2013), there is little known on patient opinions about suicide risk screening in pediatric primary care clinics. This qualitative study describes pediatric patients' opinions about suicide risk screening in the primary care setting.
Methods: As part of a larger instrument validation study, children and adolescents aged 10-21 years, inclusive, presenting to a primary care clinic in a large urban pediatric hospital were asked their opinions of suicide risk screening. Specifically, patients were asked the following questions: 1) Has anyone ever asked you about suicide before? 2) Do you think nurses or doctors should ask kids or teenagers about suicidal thoughts while they are in a primary care clinic? And 3) Why or why not? Responses were transcribed verbatim and up-loaded into NVivo 10.2 qualitative software for coding and content analysis. Qualitative data was analyzed using thematic analysis (Braun & Clarke, 2006).
Results: To date, a total of 150 young patients between the ages of 10 and 21 completed a series of self-report measures, including a demographic questionnaire, the Ask Suicide-Screening Questions (ASQ), the Suicidal Ideation Questionnaire (SIQ) and the Patient Health Questionnaire-Adolescent Version (PHQ-A). Fifty-four percent (N=81) of the sample was

female, the average age was 16.93 (SD: 2.3) and the sample was diverse: 36.3% Hispanic/Latino, 27.2% Black, 17.3% White, 9.9% mixed, 6.9% Other and 2.4% Asian/Pacific Islander. Only 44.6% of the sample (N=67) reported that they had been asked about suicide prior to their current visit. The majority of patients (96.7%) supported universal screening in primary care clinics. Salient themes characterizing reasons in favor of universal screening included prevention, safety, and healthcare provider responsibility.
Discussion: Pediatric primary care patients support suicide risk screening in primary care clinics. Results indicate that the majority of pediatric primary care patients have not been screened for suicide risk. Overwhelmingly, youth noted the importance of suicide risk screening and comfort with answering questions about suicidal thoughts and behaviors. Implications for hospital setting-based strategies for addressing the public health issue of youth suicide will be discussed.

2. THE IMPORTANCE OF SCREENING PRE-TEENS FOR SUICIDE RISK IN THE EMERGENCY DEPARTMENT

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Background: In 2015, more than 5,500 youths killed themselves. Although pre-teens have a lower suicide rate than older adolescents, the rate of suicidal behavior among youth ages 10 to 14 has significantly increased in recent years. In 2014, suicide ranked as the second leading cause of death for this age group, accounting for 425 deaths and surpassing the death rate for traffic accidents. As a result of the Joint Commission's 2016 recommendation to screen all medical patients for suicide risk, hospitals throughout the country are starting to implement screening procedures; however, without specific guidance, the appropriate age to begin screening is unknown. This study aims to describe the prevalence of screening positive for suicide risk among a sample of pre-teens (ages 10-12 years) presenting to the emergency department (ED) to determine if screening children under the age of 13 years for suicide risk in this setting is warranted.
Methods: This study is a sub-analysis of data collected as part of a multisite, cross-sectional study that developed the Ask Suicide-Screening Questions (ASQ) instrument. Participants were pediatric patients ages 10 to 21 years who presented to EDs at three urban hospitals. Patients were administered a battery of questionnaires, including the four ASQ questions and the criterion-standard Suicidal Ideation Questionnaire (SIQ). Patients who answered affirmatively to any of the four ASQ questions, and/or scored above the SIQ cutoff score were considered to be at elevated risk for suicide and required a follow-up mental health assessment. This sub-analysis specifically examines the suicide risk positive screen rate among patients ages 10-12 years, inclusive, presenting to the ED with psychiatric and medical chief complaints.
Results: A total of 524 pediatric patients presenting to the ED participated as part of the larger study. The sample included 79 patients between the ages of 10 and 12 years old (hereafter referred to as "pre-teens"; 60.8% male; 49.4% white; mean age 11.2 ± 0.8 years). Among the pre-teens, 53.2% (42) presented with medical chief complaints and 46.8% (37) presented with psychiatric chief complaints. The positive screen rate for all pre-teens was 29.1% (23/79). Over half (54.1%, 20/37) of the 37 pre-teen patients presenting with psychiatric chief complaints screened positive for suicide risk and 7.1% (3/42) of the pre-

teens presenting with medical chief complaints screened positive. Of note, 17.8% (14/79) of all pre-teens reported a previous suicide attempt, including five 10-year-old patients, indicating that 6.3% of patients attempted suicide at age 10 or younger.
Discussion: Over one-third of pre-teen ED patients in this sample screened positive for suicide risk. Although suicide is a low base-rate event in this age group, this analysis demonstrates that pre-teens think about suicide and engage in suicidal behaviors at a rate that warrants further study. Approximately 18% of pre-teen ED patients previously attempted suicide, with over 6% of patients attempting suicide before age 11. A previous suicide attempt is the greatest risk factor for future suicidal behavior; therefore, identification of patients with past attempts is vital for suicide prevention. Importantly, as more than 7% of pre-teens presenting with medical chief complainants screened positive, screening should not be limited to patients presenting with psychiatric concerns; rather, there is value in screening all pre-teen patients for suicide risk in the ED.

3. EXAMINATION OF UNIQUE FACTORS FOR RISK OF SUICIDE AMONGST PREVIOUSLY INCARCERATED HOMELESS ADULTS

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Background: With rates estimated as nine times greater than that of the U.S. general population, suicide amongst the homeless presents as a critical concern. Alarmingly, there are unique subgroups within this population which may be at even greater risk for suicide – including previously incarcerated homeless individuals. While increased rates of death have been reported amongst individuals having experienced both incarceration and homelessness, examinations of this population have primarily included comparisons to domiciled individuals, and have failed to assess cause of death and potential factors influencing premature mortality. The present study responds to the paucity of literature examining risk for suicide amongst previously incarcerated homeless individuals.
Methods: A battery of measures assessing demographic and historical lifestyle characteristics, prevalent mental health concerns, and risk for suicide were completed by 124 participants. All participants were recruited from the largest provider of emergency shelter and supportive services to homeless men, women and children in the state of Arizona. Approximately half of participants (51%) reported a history of incarceration. Linear regression tests controlling for baseline differences were utilized to examine the hypothesized relationships that experiencing incarceration and homelessness would increase risk for suicide when compared to those having only experienced homelessness.
Results: Examination of baseline characteristics revealed significant differences between homeless individuals based on self-reported incarceration history with regards to gender, religious affiliation, lifetime homelessness, age at onset of homelessness, and risk for substance abuse. When specifically considering differences in overall risk for suicide, results indicate that overall risk does not vary significantly based on incarceration history. However, through consideration of specific domains influencing risk, significant differences were discovered with consideration to risk for suicide related to social discord. This finding illustrates that those with a history of incarceration, regardless of endorsed length, demonstrate increased suicide risk associated with diminished social relationships and support.
Discussion: While it is potentially encouraging that overall risk for suicide is not significantly increased due to historical incarceration, this group of individuals nevertheless

demonstrate incredibly high risk, even when compared to at-risk populations. Ultimately, each experience may independently increase risk to a degree that additional stressors demonstrate negligible relative influence, reflecting a ceiling effect as postulated in research examining other high-risk groups. Alarmingly, although alienation and social disintegration are hallmark experiences amongst both of these challenging life events, relational stressors were found to intensify amongst those experiencing both homelessness and previous incarceration regardless of length of detention. As social support, both within one's community and family, can reduce risk for suicide it is imperative to further examine the trends demonstrated in the current study.

4. RELATIVE TOXICITY OF MEDICATIONS COMMONLY USED FOR SELF-POISONING: AN EPIDEMIOLOGICAL STUDY OF FATAL TOXICITY AND CASE FATALITY

Galit Geulayov*[1], Anne Ferrey[1], Deborah Casey[1], Claudia Wells[2], Alice Fuller[1], Clare Bankhead[1], David Gunnell[3], Caroline Clements[4], Nav Kapur[4], Jennifer Ness[5], Keith Waters[5], Keith Hawton[1]

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Background: Self-poisoning is a common method of both fatal and non-fatal self-harm ('attempted suicide'). This often involves medication prescribed for individuals, especially people with mental and emotional problems. Restriction of access to more toxic medication has been shown to be an effective method of suicide prevention. Examining the differential toxicity of individual drugs can have implications for prescribing decisions by clinicians, for decision making by regulatory agencies, and for preventing suicides. We have investigated the relative toxicity of drugs commonly used for intentional self-poisoning.
Methods: We used two indices of relative toxicity: fatal toxicity (the ratio of the rate of fatal self-poisoning with a drug to the rate of prescription of that drug) and case fatality (the rate ratio of fatal to non-fatal self-poisonings). Data on suicides by intentional self-poisoning in England were obtained from the Office for National Statistics (ONS) while information on intentional non-fatal self-poisonings was extracted from the Multicentre Study of Self-harm in England. Data on prescriptions in general practice were obtained from the Clinical Practice Research Datalink (CPRD), England. We included individuals aged 15 years and over in England during 2005-2012.
In this presentation we will first describe the fatal toxicity and case fatality methods of analysis to assess relative toxicity. We will then illustrate the findings of these approaches by presenting our results from the analysis on the relative toxicity of anxiolytic and hypnotic drugs commonly used for self-poisoning (diazepam, temazepam, chlordiazepoxide, lorazepam, nitrazepam and zopiclone). Rate ratios for the two indices of relative toxicity were calculated relative to the reference drug diazepam. Confidence intervals were calculated with the Monte Carlo method. We also estimated the proportion of alcohol involvement in fatal self-poisoning by individual drugs, since alcohol may exacerbate the toxic effect of these drugs.
Results: Using fatal toxicity, temazepam was 10 times (95% CI 5.48 to 18.99) and zopiclone nine times (95% CI 5.01 to 16.65) more toxic in overdose than the reference drug diazepam. Based on the case fatality index, temazepam and zopiclone were 13 (95% CI 6.97 to 24.41) and 12 (95% CI 6.62 to 22.17) times more toxic than diazepam, respectively. Alcohol was

involved in a smaller proportion of deaths attributed to temazepam (21%) and in a slightly greater proportion of deaths involving zopiclone (38%) relative to its involvement in those attributed to diazepam (33%).
Discussion: Examination of relative toxicity of drugs using both fatal toxicity and case fatality approaches provides valuable information relevant to suicide prevention. In the case of benzodiazepines and hypnotics, overdoses of temazepam and zopiclone are considerably more likely to result in death than overdoses of diazepam. Differences in alcohol involvement between the drugs were unlikely to account for the findings. Practitioners need to exercise caution when prescribing these drugs, especially for individuals who may be at risk of self-harm. They should also consider non-pharmacological options. Consideration of the differential toxicity of individual drugs should be integrated into decision making about prescribing by clinicians and policies of regulatory agencies as this can help reduce suicides.

5. DEVELOPING AN INTERVENTION TO PREVENT PESTICIDE SUICIDES BY RESTRICTING ACCESS THROUGH VENDORS

Manjula Weerasinghe*[1], Flemming Konradsen[2], Michael Eddleston[3], Melissa Pearson[3], Shaluka Jayamanne[4], David Gunnell[5], Keith Hawton[6], Suneth Agampodi[1]

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Background: The World Health Organization now recognizes that pesticide ingestion is one of the three most common means of global suicide. In South Asia, up to one in five individuals who use pesticides for self-poisoning purchased them from a shop immediately prior to the event. Thus far, no research has taken place to determine whether interventions implemented through the pesticide vendors might be acceptable or effective, despite the hundreds of thousands of such purchases each year. We aimed to identify an intervention that has the potential to be effective in reducing access to pesticide from shops for self-poisoning.
Methods: We carried out three studies; first study was a case-control study to identify factors that were associated with purchasing pesticide from shops for self-poisoning. Fifty patients who had bought pesticides from shops for self-poisoning (cases) compared with 200 unmatched legitimate customers who did not use the purchased pesticides for self-harm (controls). Based on identified risk factors we aimed to identify and develop potential public health interventions that might be implemented through vendors. We then conducted a stakeholder analysis to select the most promising intervention among the identified interventions. This study was done in two-steps; first, assessed the stakeholders' interest and power for the success of each intervention using purposely selected 12 stakeholders representing farmers, pesticide vendors, pesticide industry, Department of Agriculture, general community, public health and then 7 focus group discussions were conducted with separate stakeholders to explore strengthens and weaknesses of each intervention. Finally, the selected intervention was piloted in 14 pesticide shops for 3 months period to assess the feasibility and acceptability.
Results: The case-control study identified two distinguishing risk factors: alcohol intoxication during the purchase (adjusted odds ratios [AOR] 36.5, 95% confidence intervals [CI] 1.7-783.4) and being a non-farmer AOR 13.3, 95% CI 1.8-99.6. Avoiding selling pesticides to alcohol intoxicated and non-farmers would prevent 72% of cases. Based on results of the case-control study, below we proposed four potential interventions that restrict the sales of pesticides for high-risk customers; 1) farmer identity-cards, 2) prescription for pesticides, 3) increased waiting-times before purchased and 4) training for pesticide vendors to avoid high-risk customers. All stakeholders were identified as drivers (high interest and

high power) for training for vendors. In particular, the most important stakeholders – farmers and vendors - supported the intervention because it would not affect their pesticide selling and buying behavior. Vendors were trained to check for intoxication, and to ask questions that farmers would know. Most vendors reported that they were enthusiastic with the intervention. Vendors also reported that they were aware from community feedback that they had prevented seven suicide attempts. However, on four occasions they had been unable to recognize the real intention of the customers who had then drunk pesticide.
Discussion: Our findings indicate pesticide vendor training has potential to prevent a substantial proportion of people who buy pesticides for self-poisoning. Since pesticide poisoning is a highly lethal method, any reduction in the incidence of pesticide poisoning is likely to result in an overall reduction in suicide numbers. Further assessment of the effectiveness and sustainability of this initiative is needed and if effective, it could contribute to saving tens of thousands of lives each year across the Asia.

6. EFFECT OF HOUSING FIRST ON SUICIDAL BEHAVIOUR: A RANDOMIZED CONTROLLED TRIAL OF HOMELESS ADULTS WITH MENTAL DISORDERS

Joshua Aquin*[1], Leslie Roos[2], Jino Distasio[3], Lawrence Katz[1], Jimmy Bourque[4], James Bolton[1], Shay-Lee Bolton[1], Jacquelyne Wong[1], Dan Chateau[1], Julian Somers[5], Murray Enns[1], Stephen Hwang[6], James Frankish[7], Jitender Sareen[1]

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Background: Suicidal behaviour is disproportionately prevalent amongst homeless persons; a risk that is further exaggerated when coupled with mental disorders. Unfortunately, these comorbidities and limited effective social supports make treating this high-risk group challenging. Novel programs such as Housing First have been demonstrated to improve quality of life and increase housing stability, but its effect on suicidality has remained unclear. Given that increased housing stability has previously shown to correlate with decreased suicidal behaviour, we hypothesized that Housing First would decreased suicide attempts and ideation compared to Treatment As Usual amongst homeless adults with comorbid mental disorders.
Methods: The At Home/Chez Soi project was an unblinded, randomized control trial examining the impact and effectiveness of Housing First. The trial was conducted across five Canadian cities (Vancouver, Winnipeg, Toronto, Montreal, Moncton) from 2009-2013. Homeless adults with a diagnosed major mental health disorder were recruited through community agencies and randomized to Housing First (n=1265) and Treatment As Usual (n=990). Housing First participants were provided with private housing units and received case management support services, whereas Treatment As Usual participants retained access to existing community supports. Past month suicidal ideation was measured at baseline, 6, 12, 18, and 21/24 months. A history of suicide attempts was measured at baseline and 21/24-month follow-up
Results: Compared to baseline, there was an overall trend of decreased past month suicidal ideation (Estimate=-.57, SE=.05, p<.001), with, no effect of treatment group (i.e. Housing First versus Treatment As Usual; Estimate=-.04, SE=.06, p=.51). Furthermore, there was no effect of treatment status (Estimate=-.10, SE=.16, p=.52) on prevalence of suicide attempts (HF=11.9%, TAU=10.5%) during the two year follow-up period. Covariate predictors suicidal ideation include younger age, PTSD, and mood, panic, psychotic and substance use disorders. Predictors of suicide attempts include younger age, lifetime homelessness less than three months, PTSD and mood disorders.

Discussion: This study failed to find evidence that Housing First is superior to Treatment As Usual in reducing suicidal ideation and attempts. Given that Housing First programs are being implemented worldwide, the finding that Housing First programs by themselves may not be effective at preventing suicide is important and relevant. This presentation will discuss the novel results of this trial, and attempt to suggest alternative/supplemental interventions for reducing suicidal behaviour in this context. We will also explore other valuable lessons from this research, including the potential importance of perceived social support and critical time points for practitioners to recognize increased risk of suicidal behaviour.

PROSPECTIVE STUDIES IN SUICIDE BEHAVIOR

Chair: Carla Canuso, Janssen Research & Development

1. CLINICIANS CONFLICTING EMOTIONAL RESPONSES TO HIGH SUICIDE RISK PATIENTS AS PREDICTORS OF SHORT-TERM SUICIDAL BEHAVIOR

Zimri Yaseen*[1], Igor Galynker[2], Lisa Cohen[2]

[1]Icahn School of Medicine at Mount Sinai, [2]Mount Sinai Beth Israel

Background: Clinician's emotional responses to patients have been recognized as potentially relating to treatment outcome, however they have received little attention in the literature on suicide risk. We examine the relationship between a novel targeted measure of clinicians' emotional responses to high-risk psychiatric inpatients and their short-term post-discharge suicide behavior.
Methods: First-year psychiatry residents' emotional responses to their patients were assessed anonymously with the novel self-report 'Therapist Response Questionnaire-Suicide Form' (TRQ-SF). Patient outcomes were assessed at 1-2 months post-discharge, and post-discharge suicide outcomes were assessed with the Columbia Suicide Severity Rating Scale. Following exploratory factor analysis of the TRQ-SF, scores on the resultant factors were examined for relationships with clinical and demographic measures and post-discharge suicide behavior.
Results: A two-factor model fit the data, with factors reflecting dimensions of affiliation/rejection and distress/non-distress. Two items that did not load robustly on either factor had face validity for hopefulness and hopelessness and were combined as a measure along a hopefulness/hopelessness dimension. The interaction Distress×Hopefulness, reflecting a conflicting emotional response pattern, significantly predicted post-discharge suicide outcomes even after covarying for depression, entrapment, and suicidal ideation severity.
Discussion: Clinicians' conflicting emotional responses to high-risk patients predicted subsequent suicidal behavior, independent of traditional risk factors. Our findings demonstrate the potential clinical value of assessing such responses.

2. CLINICIANS' REGULATION OF NEGATIVE EMOTIONS AND PATIENTS' SHORT-TERM SUICIDAL BEHAVIORS

Igor Galynker*[1], Zimri Yaseen[1], Irina Kopeykina[1], Mariah Hawes[1]

[1]Mount Sinai Beth Israel

Background: Clinicians' conflicting emotional responses to patients at high risk for suicide may be related to their short-term suicidal behavior, but it is unclear whether this association is an indicator of patient downstream risk or is a potentiator of this risk. In this context we have analyzed the impact of clinicians' ability to regulate negative emotions on emotional

responses to patients psychiatrically hospitalized for suicide risk, and on psychiatric outpatients.
Methods: Clinicians' (C) emotional responses to psychiatric patients (P) at elevated risk for suicide were assessed with the Therapist Response Questionnaire Short Form (TRQ-SF), while their ability to regulate negative emotions was evaluated with the Difficulties with Emotional Regulation Scale (DERS). Relations between DERS subscales and TRQ-SF factors were examined for high-risk inpatients (Study A; C n=19, P n=114) and lower risk outpatients (Study B; C n=54, P n=150). Level of suicide outcomes ('suicidality') was assessed with the Columbia Suicide Severity Rating Scale at 1 to 2 months post-discharge, in study A and 1 month after initial assessment in study B. Linear regression models with patient suicidality as the outcome were used to examine the contribution of clinician traits and specific emotional responses to patient outcome.
Results: TRQ-SF factors of affiliation and hopefulness, but not distress were significantly affected by clinician affect regulation traits. In study A, DERS goals (described as "difficulties concentrating and accomplishing tasks when experiencing negative emotions") ($p=0.006$), non-acceptance ($p=0.031$), and awareness ($p=0.025$) scores predicted dislike and hopelessness for suicidal patients. In study B, DERS goals scores predicted dislike ($p=0.015$) and hopelessness ($p=0.001$) for suicidal patients. In study A, DERS goals ($p=0.031$) was significantly associated with patients' post-discharge suicidality, while in Study B there were no relations between clinician DERS scores and patient follow-up suicidality.
Discussion: Clinicians' ability to regulate their negative emotions predicted their emotional responses to suicidal patients and contributed independently to high-risk patients' short-term suicide risk. Clinicians' emotional regulation difficulties, when impacting their behavior, may be related to post-discharge suicidal outcomes in high-risk inpatients.

3. USE OF ONLINE VIDEO ANIMATION FOR KNOWLEDGE TRANSLATION AND DISSEMINATION OF SUICIDE RESEARCH RESULTS: TO AUSTRALIAN ABORIGINAL COMMUNITIES

Joseph Tighe*[1], Helen Christensen[2], Fiona Shand[2], Katherine Boydell[1]

[1]Black Dog Institute, [2]Black Dog Institute, University of New South Wales

Background: Australian Aboriginal and Torres Strait Islander peoples have been heavily researched since the colonization of Australia yet continue to report very poor health outcomes. Trust of non-Aboriginal researchers can be tenuous, and to this day Aboriginal communities are attempting to repatriate human remains and specimens from European museums that were taken in the name of 'research'. Researchers are often criticized for their failure to report research findings back to communities and it is unlikely the journal articles publishing research involving Aboriginal and Torres Strait Islander participants have sufficient reach into communities where participants, their families and health professionals reside. Scientific journal articles also require the reader to be educated at the level of the author to ensure the technical and specialized content is understood. As a result, while new knowledge gains publication it is rarely communicated and translated back to the communities involved in its creation.
Methods: The results of an mHealth RCT have been published in 2017; http://bmjopen.bmj.com/content/7/1/e013518.info. This presentation aims to translate these results by use of a professionally produced whiteboard style animated video.
Results: An animated video featuring results of a suicide prevention trial will be completed in July 2017. The video will be published and distributed online and aims to translate and disseminate the knowledge derived from mHealth suicide prevention research conducted

from 2013-2015 in the Kimberley region of north Western Australia. The video will describe the impact of the world's first app for suicide prevention (ibobbly) on the target outcomes of suicide ideation, depression, distress and impulsivity. The video will also provide a broader view of why and how the app was created, and finally acts as a recruitment tool for further research.
Discussion: To the best of our knowledge this is the first online video animation to disseminate research results to Australian Aboriginal communities.

4. ASSOCIATION OF CHILD ABUSE WITH SUICIDAL IDEATION: PLANS AND ATTEMPTS IN A SAMPLE OF CANADIAN PUBLIC SAFETY PERSONNEL

Sarah Turner*[1], Tamara Taillieu[1], R. Nicholas Carleton[2], Jitender Sareen[1], Tracie Afifi[1]

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Background: Experiences of child abuse have been identified as risk factors for suicidal behaviour in adulthood in general population and military samples; however, this association has not been studied among Public Safety Personnel (PSP) in Canada. Importantly, the prevalence of child abuse exposure among PSP, including municipal or provincial police, Royal Canadian Mounted Police (RCMP), corrections officers, firefighters, paramedics, and dispatchers, is currently unknown. Many PSP experience work-related traumatic experiences (WRTE). It is currently unknown how these experiences are related to suicidal behaviours in this population and if a child abuse history modifies the relationship between WRTE and suicidal behaviours. The current research objectives are to: 1) determine the prevalence of child abuse exposure among Canadian PSP; 2) examine the associations between child abuse exposure and suicidal ideation, plans, and attempts; 3) examine the associations between WRTE and suicidal ideation, plans, and attempts, and 4) determine if child abuse exposure has an additive or interaction effect with WRTE on suicidal ideation, plans and attempts among Canadian PSP.
Methods: Data were drawn from a web-based, self-report survey collected by Canadian Institute for Public Safety Research and Treatment. Analyses included 4,340 municipal or provincial police, RCMP, corrections officers, firefighters, paramedics, or dispatchers. Child abuse history included physical abuse, sexual abuse, and exposure to intimate partner violence. WRTE included seven items that assessed exposure to death, serious injury, or disasters while on duty. Suicidal behavior included lifetime ideation, plans, and attempts. Logistic regressions were computed to test the associations between child abuse history and suicidal behaviours. Additive and interaction models were run to test the relationships between child abuse and WRTEs on suicidal behaviours.
Results: Among all PSP, 55.9% experienced some form of child abuse. All types of child abuse were significantly associated with lifetime suicidal ideation and plans, with a few exceptions likely due to underpowered models (suicidal ideation range of adjusted odds ratios [AORs], 1.7 [95% CI, 1.1, 2.7] to 6.89 [95% CI, 2.4, 20.0]; suicidal plans range of AORs, 1.9 [95% CI 1.0, 3.4] to 5.32 [95% CI 2.6, 10.9]). Odds ratios were attenuated for lifetime suicide attempt models, although many still reached significance. Overall, child abuse among dispatchers had the strongest associations with suicide related behaviours, whereas the associations were weaker for RCMP. Additive models indicated that experiencing child abuse history only was more strongly related to suicidal ideation and plans than experiencing WRTE only, but experiencing both resulted in the strongest association. No interaction models reached significance.
Discussion: Over half of Canadian PSP experienced child abuse, which is higher than the Canadian general population and similar to the Canadian military population. Child abuse

experiences were strongly associated with lifetime suicidal ideation, plans, and attempts for all PSP types; however, some PSP types had stronger associations than others. WRTE were associated with lifetime suicidal behaviours; however, stronger associations exist for experiences of child abuse. Suicidal behaviour is an important public health concern among PSP. The current results indicate that having a child abuse history and WRTE are important factors associated with suicidal ideation, plans, and attempts. The additive effects of child abuse history and WRTE are important novel results to consider for suicide prevention efforts among PSP.

5. ELECTRODERMAL ACTIVITY AND SUICIDE: THE EUDOR-A STUDY

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Background: Electrodermal reactivity has been successfully used as indicator of interest, curiosity as well as depressive states. The measured reactivity depends on the quantity of sweat secreted by the eccrine sweat glands located in the hypodermis of palmar and plantar regions. Electrodermal hyporeactive individuals show no response or an unusual rapid habituation to identical non-significant stimuli. Previous studies have reported that electrodermal hyporeactivity has a high sensitivity, up to 97%, and a high raw specificity, i.e. negative predictive value, up to 98%, for suicide.

A large multicentre European study (EUDOR-A) has been recently performed, aimed at (1) testing the effectiveness and the usefulness of the EDOR (ElectroDermal Orienting Reactivity) Test as a support in the suicide risk assessment of depressed patients and (2) assessing the predictive value of electrodermal hyporeactivity, measured through the EDOR Test, for suicide and suicide attempt in adult patients with a primary diagnosis of depression.

Methods: 1573 patients with a primary diagnosis of depression, either currently depressed or in remission, were recruited at 15 centres in 9 different European countries, and followed-up for 3-years to assess the possible occurrence of suicidal behaviours. Assessment included: Montgomery-Asberg Depression Scale; clinical interview assessing, among the other issues, history of previous suicide attempts, and suicide intent of the worst attempt, rated according to the first eight items of the Beck Suicide Intent Scale; the EDOR Test.

Results: Based on previous studies, expected results would be that patients realizing a suicide attempt with a strong intent or committing suicide should be electrodermally hyporeactive in most cases.

Actually, the preliminary results of the study supported a strong correlation between electrodermal hyporeactivity and history of suicide attempt. At the 1- year follow-up, hyporeactive patients showed to be more at risk of suicide than reactive patients, even if this finding was not statistically significant.

Discussion: EUDOR-A is the first study evaluating the effectiveness and the usefulness of an objective and non-invasive tool (the EDOR Test) as support in the suicide risk assessment of depressed patients. Moreover, EUDOR-A is conducted in the naturalistic setting of psychiatric services, allowing an easier translation of research findings into clinical practice. All staff members were specifically trained in order to maximise the reliability and validity of gathered data.

Main limitations of the study rely in the fact that many of the suicide-related information are self-reported. However, the participating centres were strongly encouraged to gather the access also to medical records. Moreover, for ethical reasons it was not possible to conduct a blind study in which EDOR test results were ignored in the clinical assessment of suicide

risk. Hence, it is likely that there was a prevention effect of the follow-up performed, and that a more "protective" treatment strategy was adopted for hyporeactive patients, after the test results were received by the patients' treating clinicians; likely due to the small number of completed suicides during the follow-up period, it was not found a statistically significant correlation between suicide and electrodermal hyporeactivity, thus possibly reducing the association between hyporeactivity and suicide proneness. Moreover, it cannot be excluded that the next follow-up time would yield different results.
Nonetheless, the preliminary results of this research seem to support the use of the EDOR Test as a useful objective and non-invasive adjunct in the suicide risk assessment of depressed patients.

6. EFFICACY AND SAFETY OF INTRANASAL ESKETAMINE FOR THE RAPID REDUCTION OF SYMPTOMS OF MAJOR DEPRESSIVE DISORDER, INCLUDING SUICIDAL IDEATION, IN PATIENTS ASSESSED TO BE AT IMMINENT RISK FOR SUICIDE: A PROOF-OF-CONCEPT STUDY

Carla Canuso*[1], Jaskaran Singh[1], Maggie Fedgchin[1], Larry Alphs[2], Rosanne Lane[1], Pilar Lim[1], Christine Pinter[1], Husseini Manji[1], Wayne Drevets[1]

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Background: Conventional antidepressants are used as a standard of care treatment for patients with major depressive disorder (MDD) who are at imminent risk for suicide; however, their delayed onset of action often limits their utility in treating these vulnerable patients. Intranasal esketamine (ESK) is currently in development for the rapid reduction in symptoms of MDD, including suicidal ideation (SI), in patients who are assessed to be at imminent risk for suicide.
Methods: PeRSEVERe was a 12-week, randomized, double-blind (DB), placebo-controlled, multicenter, phase 2 study. Eligible patients previously diagnosed with MDD (based on DSM-IV criteria) as well as active SI and intent, and who were in need of acute psychiatric hospitalization, were randomized (1:1) to receive intranasal ESK (84 mg) or intranasal placebo, administered 2 times/week during the DB phase (day 1-25). The primary endpoint was change from baseline (day 1, predose) to 4 hours postdose on day 1 in the Montgomery-Asberg Depression Scale (MADRS) total score. Secondary and exploratory endpoints included change from baseline to day 2 (~24 hours postdose) in MADRS total score, change from baseline to 4 hours postdose and on day 2 (~24 hours postdose) in MADRS suicide item and in Clinical Global Judgment of Suicide Risk (CGJ-SR) measured using the Suicide Ideation and Behavior Assessment Tool, as well as response rate (≥50% improvement in MADRS) and remission rate (MADRS total score ≤12) on day 2 (~24 hours postdose). Safety assessments included treatment-emergent adverse events (TEAEs), vital signs and Clinician Administered Dissociative States Scale (CADSS) total score. Statistical analyses were performed using analysis of covariance models; as a proof-of-concept study, a two-sided 0.20 significance level was prespecified to indicate evidence of potential therapeutic effect.
Results: Of 68 patients randomized, 49 (ESK: 27; placebo: 22) completed the DB treatment phase. Mean (SD) baseline MADRS total scores were: 38.5 (6.17) and 38.8 (7.02) for ESK and placebo groups, respectively. Change from baseline in MADRS total score on day 1 (4 hours postdose – primary endpoint) and day 2 (~24 hours postdose - secondary endpoint) was significantly greater for ESK treatment compared with placebo (both 2-sided; p=0.015). A greater proportion of patients in the ESK group achieved resolution of suicide risk (CGJ-SR

score of 0 or 1) vs placebo at 4 hours (21.2% [7/33] vs 9.7% [3/31]) and on day 2 (~24 hours postdose: 40% [14/35] vs 6.5% [2/31]). As compared with placebo group, ESK group had a higher response rate (54.3% [19/35] vs 29% [9/31]) and remission rate (34.3% [12/35] vs 16.1% [5/31]) on day 2 (~24 hours postdose). During DB phase, the most common (≥20%) TEAEs reported in the ESK group were nausea (37.1%), dizziness (34.3%), dysgeusia, headache and dissociation (31.4% each), and vomiting (20%); serious TEAEs were observed in 4 patients (suicide ideation: 2, agitation: 1, depressive symptoms: 1). Patients in the ESK group reported transient perceptual distortions, as measured by the CADSS, and a modest increase in blood pressure.
Discussion: Treatment with intranasal ESK demonstrated significant improvement in reducing depressive symptoms and suicidality compared with placebo at 4 hours (day 1) and ~24 hours (day 2) after the initial dose. Moreover, intranasal ESK treatment exhibited rapid onset of response and a greater likelihood of remission in this vulnerable population. No new safety concerns were identified with intranasal ESK.

CURRENT ISSUES IN SUICIDE PREVENTION

Chair: Christine Moutier, American Foundation for Suicide Prevention

1. EFFECT OF SUICIDAL IDEATION OR ATTEMPT ON HOSPITALIZATION PATTERNS AND COSTS OF CARE DURING INPATIENT STAYS FOR MAJOR DEPRESSIVE DISORDER

Kenneth Kramer*[1], Sanjida Ali[1], Pamela Landsman-Blumberg[2], Marla Kugel[2]

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Background: Major depressive disorder (MDD) is the most common primary diagnosis among psychiatric hospitalizations. These hospitalizations represent a significant economic burden on healthcare systems, as well as significant burden on patients and their families. However, there is limited information about the current duration and costs associated with MDD hospitalization and whether the presence of suicidal ideation or suicide attempt affects these measures.
Methods: An analysis of the Premier Perspective® Hospital Database was conducted using records of hospital admission for MDD on any date from January 1, 2014 to December 31, 2015. Hospitalizations with an admission diagnosis of single episode MDD (International Classification of Diseases, 9th Revision, Clinical Modification [ICD-9-CM] diagnosis code 296.2 or 10th Revision [ICD-10-CM] code F32) or recurrent episode MDD (ICD-9-CM 296.3, ICD-10-CM F33) were retained for analysis. The presence of codes V62.84 (ICD-9-CM) or R45.851 (ICD-10-CM) defined suicidal ideation; codes E950-E959 (ICD-9-CM) or T14.91, X71.0XXA – X83.8XXS, Z91.5 (ICD-10-CM) defined suicide attempt. Patient demographics, length of stay, total costs of hospitalizations, and readmission rates were analyzed at the patient level; patient cohort was assigned as the highest severity of suicide status cohorts (no ideation/attempt, suicidal ideation, suicide attempt) where multiple MDD admissions occurred during the 2-year evaluation period. Differences among cohorts were analyzed using a one- way ANOVA for continuous variables and using chi-square for categorical variables.
Results: Of all hospital admissions during this period (N=12,608,691), 1.1% (N=136,704) had a primary diagnosis of MDD; these admissions were experienced by 113,910 patients. Of these patients, 54.7% had suicidal ideation (n=62,349), and 7.1% (n=8,053) had a suicide attempt. Patients admitted for a suicide attempt tended to skew younger (46.3%; ages 18-34) than those with suicidal ideation (42.3%; ages 35-54), or without ideation or attempt (38.7%;

ages 35-54). The mean total inpatient days per patient was 7.2 days (no ideation/attempt, 6.7 days; ideation, 7.5 days; attempt, 8.2 days; P<0.001). More patients with suicide attempt had >1 hospital stay for MDD or ≥1 readmission for MDD within 30 days (20.3% and 9.1%, respectively) compared with patients with suicidal ideation (16.0% and 6.8%) or patients with no ideation or attempt (6.3% and 2.3%; all P<0.001). The mean patient-level total hospitalizations cost was $8057 (no ideation/attempt, $7507; ideation, $8204; attempt, $9883; P<0.001) across the 2-year evaluation period.
Discussion: MDD-related acute care hospitalizations are numerous and costly to healthcare systems. Surprisingly, the highest rates of suicide attempt were in the youngest patients, often teenagers. Patients with suicide attempt spent more days in the hospital and were also more likely to be readmitted within 30 days. Antidepressant medications currently used to treat MDD in the hospital setting can take 4-6 weeks to reach maximum effect, yet a significant number of patients have readmissions for MDD within 30 days. In general, there is an unmet medical need for medications with a faster onset of action that may allow for shorter hospitalizations, lower costs, and decreased rates of readmission. Such medications may be especially beneficial to patients with MDD who are hospitalized due to suicidal ideation or attempt.

2. SUICIDE AFTER PSYCHIATRIC HOSPITALIZATION FOR DEPRESSION IN FINLAND IN 1991-2014

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Background: Treatment practices in depression have undergone major transformations since the 1990s. However, depressive patients' suicide mortality and possible time-trends in it remain poorly known. Moreover, data on risk factors and their gender differences for suicide deaths is limited.
Methods: Register data from (a) The Finnish Hospital Discharge Register, on all first psychiatric hospitalizations in Finland in 1991 – 2011 with a principal diagnosis of a depressive disorder, (b) sociodemographic information from the Census Register of Statistics Finland, and c) causes of death from Statistics Finland's register were linked pertaining to years 1990-2014. The subjects were followed-up until death by suicide, for other reasons, or end of follow-up in 2014 (maximum 24 years).
Results: Altogether 56 826 first psychiatric hospitalizations for depression were included. Overall, 2567 suicide deaths (men 1598, women 969) occurred during the follow-up period. The cumulative risk of suicide (6.1% overall) was higher in men (8.6%) than women (4.1%). The age- and gender-adjusted hazards of suicide declined to half (HR 0.48) in consecutive admission cohorts. Independent predictors of suicide were severity of depression, co-morbid alcohol dependence, higher socioeconomic status and living alone, with highest risks associated with previous suicide attempts and male gender. Gender differences in risk factors and suicide methods were observed.
Discussion: Suicide risk in depression is time- and context-dependent, and has markedly declined in Finland. Gender, preceding attempts and baseline clinical risk factors predict suicide mortality over time. Some gender differences exist in risk factors, but they do not well explain gender disparity in mortality.

3. VALIDATION OF SUICIDE-SPECIFIC RUMINATION AS A NOVEL RISK FACTOR FOR SUICIDAL BEHAVIOR AND DEVELOPMENT OF A SELF-REPORT INSTRUMENT: THE SUICIDE RUMINATION SCALE

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Background: Suicide prediction and prevention has not improved despite over 50 years of research, indicating a need for novel risk factors, particularly factors that may facilitate a transition from suicidal thoughts to behaviors. Suicide-specific rumination, defined as a mental fixation on one's suicidal thoughts, intentions, and plans, may be a potentially novel risk factor that warrants empirical attention. The present study developed and validated a measure designed to assess suicide-specific rumination (Suicide Rumination Scale [SRS]), including convergent and discriminant validity, group differences by attempter/ideator status, and associations with past suicide attempts controlling for other relevant risk factors across three unique samples.
Methods: Three samples (Sample 1: N = 300 students with lifetime suicidality, 80% female, aged 18 to 43 years [M = 19.08, SD = 2.07]; Sample 2: N = 518 students, 84.3% female, aged 16 to 55 years [M = 21.26, SD = 5.61]; Sample 3: N = 511 community members, 55.4% female, aged 18 to 71 years [M = 36.05, SD = 11.49]) completed a battery of self-report measures online. Item response theory, exploratory and confirmatory factor analyses, correlational analyses, one-way ANOVAs, and logistic regressions were utilized to test study hypotheses and validate the SRS.
Results: Using a two-parameter, graded response model within item response theory, the SRS was reduced from a pool of 41 items to a final set of 5 items that are highly discriminant with varying levels of difficulty. The factor structure of the SRS was best represented by a bifactor higher-order model, with a higher-order factor representing suicide-specific rumination and two lower-order factors reflecting (1) persistence and inescapability of suicidal thinking; and (2) ruminations about suicidal plans/preparations. Convergent validity analyses indicated that across the three samples, suicide-specific rumination was positively associated with, but not redundant with, measure of suicidal ideation (rs = .38 to .54, ps < .001), depression (rs = .31 to .53, ps < .001), anxiety (rs = .16 to .48, ps < .001), depressive rumination (rs = .39 to .59, ps < .001), perceived burdensomeness (rs = .31 to .61, ps < .001), thwarted belongingness (rs = .15 to .38, ps = .010 to < .001), capability for suicide (rs = .15 to .19, ps = .001 to < .001), distress tolerance (rs = .33 to .54, ps < .001), agitation (rs = .29 to .54, ps < .001), insomnia (rs = .24 to .40, ps < .001), and lifetime Acute Suicidal Affective Disturbance (ASAD) symptoms (rs = .57 to .59, ps < .001). Suicide-specific rumination also differentiated lifetime attempters (Ms = 7.59 to 9.24, SDs = 5.36 to 5.91), ideators (Ms = 4.51 to 6.42, SDs = 4.63 to 5.71), and non-suicidal individuals (Ms = .08 to 1.49, SDs = .69 to 3.19, all ps < .001). Finally, suicide-specific rumination was associated with the presence of a past suicide attempt (ORs: 1.21 to 3.16, ps < .001) above and beyond all other suicide risk factors (Sample 1: ORs: .82 to 1.07, ps = .001 to .961; Sample 2: ORs: .95 to 1.31, ps = .030 to .954; Sample 3: ORs: .99 to 1.09, ps = .219 to .990).
Discussion: These findings suggest that the SRS is a valid measure of suicide-specific rumination, further, that suicide-specific rumination may be an important, novel contributor to the transition from suicidal thoughts to behaviors. Though these findings are preliminary, targeting this pernicious thought pattern may reduce the likelihood of engagement in suicidal behavior.

4. FACTORS AFFECTING PROCESSES OF CARE IN EMERGENCY DEPARTMENT PATIENTS AT SUICIDE RISK: FINDINGS FROM THE ED-SAFE STUDY

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Background: Suicide is difficult to predict at the individual level: one pragmatic approach is to identify suicide risk in healthcare settings. For example, up to half of those who die by suicide visit an emergency department (ED) in the year before their death. However, ED management of patients with suicide risk is inconsistent, potentially missing a valuable opportunity for intervention. Here, we identify factors associated with receipt of emergency psychiatric evaluation and inpatient admission in individuals who screened positive for suicide risk in the ED.
Methods: Participants who screened positive for suicide risk at eight EDs across the US from 2009 through 2014 were recruited as part of the Emergency Department Safety Assessment and Follow-up Evaluation (ED-SAFE) study. Detailed interviews and medical chart reviews were conducted for 1375 ED patients who reported current ideation or a recent suicide attempt. Logistic regression analyses identified factors associated with receiving (1) an emergency psychiatric evaluation and (2) any inpatient admission.
Results: Results: In the final model for evaluation (pseudo R2=0.36), site, phase, Hispanic ethnicity, drug abuse, and having psychiatric behavior in the presenting complaint were all significantly associated with receiving an emergency psychiatric evaluation. Somatization scores and diagnosis of alcohol use disorder were inversely associated with evaluation. The final model for admission (pseudo R2=0.27) indicated that site, insurance status, having psychiatric behavior in the presenting complaint, any previous psychiatric hospitalization, higher depressive scores, and higher severity of suicidal ideation were all independently associated with inpatient admission. Self-reported diagnosis of eating disorder was inversely associated with inpatient admission. Having psychiatric behavior as part of the presenting complaint had an adjusted odds ratio of 7.27 (95% CI: 4.14-12.75) for emergency psychiatric evaluation and 3.19 (95% CI: 1.89-5.37) for inpatient admission.
Discussion: Discussion: Over and above a range of psychosocial and clinical factors, presenting with a psychiatric complaint may strongly influence the route of the patient through the entire ED visit. ED providers should evaluate established suicide risk factors in determining processes of care for patients with suicidal ideation or behavior.

5. PERCEPTIONS OF FIREARMS AND SUICIDE: THE ROLE OF MISINFORMATION IN STORAGE PRACTICES AND OPENNESS TO MEANS SAFETY MEASURES

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Background: Firearm ownership and unsafe storage increase risk for suicide. Little is known regarding factors that influence storage practices and willingness to engage in means safety.
Methods: A sample of 300 American firearm owners (53.0% male; 82.3% White; 92.0% heterosexual; mage = 36.11; age range = 20-69) was recruited via Amazon's Mechanical Turk (mTurk) program. The majority of the sample (60.7%) reported owning only one firearm (range = 1-20), with 96.7% reporting that the weapon(s) was stored at home. With respect to type of firearm, 80.7% reported owning a handgun, 36.0% reported owning a rifle, and 28.0%

reported owning a shotgun. With respect to storage, 45.3% reported not using a locking device (e.g. trigger lock) on at least one firearm, 35.7% reported storing at least one firearm loaded, and 29.3% reported storing at least one firearm in a non-secure location (e.g. bedside table). Nearly half (46.7%) of the sample resided in the Midwest region, with 19.7% in the South, 16.3% in the Northeast, and 16.0% in the West. A total of 19.7% of the sample reported lifetime suicidal ideation, 6.3% reported a lifetime suicide plan, and 5.0% reported a lifetime suicide attempt. Fearlessness about death was assessed using the Acquired Capability for Suicide Scale. Storage practices, beliefs about guns and suicide, and openness to means safety were assessed using items developed for this project.
Results: Firearms stored in non-secure locations (b = 0.44; 95% CI = 0.18 – 0.70; p = .001) and without a locking device (b = -0.33; 95% CI = -0.57 – -0.08; p = .008) were associated with lower beliefs in the relationship between firearm storage and suicide risk. Nearly half of the sample (45.7%) either strongly or very strongly believed in the notion of means substitution. Fearlessness about death moderated the association between current secure versus non-secure storage and beliefs regarding firearm storage and suicide risk (b = -.02; SE = .01; p = .02). For both secure and locked storage of a firearm, there was a significant indirect effect of current storage practices on willingness to engage in means safety in the future through current beliefs regarding the relationship between firearm storage and suicide risk. Firearms stored non-securely were associated with less willingness to store firearms safely to prevent one's own or another's suicide and to temporarily remove firearms to prevent another's suicide. Unlocked firearms were associated with less willingness to store firearms safely to prevent one's own or another's suicide and to remove firearms to prevent one's own or another's suicide. Loaded firearms were associated with less willingness to store firearms safely to prevent one's own or another's suicide but did not differ on removing firearms to prevent one's own or another's suicide.
Discussion: Firearm owners are prone to inaccurate beliefs about the relationship between firearms and suicide. These beliefs may influence both current firearm storage practices and the willingness to engage in means safety.

6. POLITICAL BELIEFS, REGION OF RESIDENCE, AND OPENNESS TO FIREARM-SPECIFIC MEANS SAFETY MEASURES TO PREVENT SUICIDE

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Background: Firearms typically account for approximately half of all suicides in the US (CDC, WISQARS, 2014). Firearms are the most lethal means of suicide, almost always resulting in death (Elnour & Harrison, 2008; Anestis, 2016).
Means safety—the safe storage, limitation of access, or decrease in potency of lethal methods for suicide—is effective in reducing suicide (Barber & Miller, 2014; Khazem et al., 2016). Means safety approaches that focus on firearms have exhibited substantial potential as suicide prevention tools. For instance, among firearm-owning households, suicide risk is lower when firearms are stored locked, unloaded, and separate from ammunition (Grossman et al., 2007). Geographic and political factors affect the decision to own a firearm and have the potential to influence openness to firearm-specific means safety interventions. Firearm ownership rates are higher in the South (29%) and Midwest (27%) than in the West (21%) and the Northeast (17%) and individuals living in rural areas are twice as likely as those in urban areas to own a firearm (Pew Research Center, 2013). Americans with conservative political beliefs are approximately twice as likely as those with liberal beliefs to own a firearm (Morin, 2014).

Little evidence exists to yield a complete understanding of the factors that may inhibit firearm owners' willingness to partake in means safety measures. This study examines the relationship between American firearm owners' political beliefs, region of residence, and demographics and their willingness to engage in the means safety practices of storing their firearm safely and allowing a trusted individual to hold their firearm during a time of crisis. We hypothesized that American firearm owners with conservative political beliefs would be less open to firearm-specific means safety measures than those with moderate or liberal beliefs and that firearm owners from regions with higher rates of firearm ownership and conservative beliefs would be less open to means safety measures than those living in regions with lower rates of firearm ownership and conservative beliefs.

Methods: A total of 300 adult firearm owners residing in the US (53.0% male; 82.3% White; 92.0% heterosexual; mean age = 36.11; age range = 20 - 69) were recruited via Amazon's Mechanical Turk program.

Basic demographics, region of residence, political beliefs, and factors related to firearm ownership and openness to means safety measures were assessed through questions developed by the research team.

Results: Significant differences in willingness to store firearms more safely or allow a trusted individual to temporarily store firearms to prevent one's own suicide attempt were found for region ($F (6, 506) = 2.149$, $p = .047$; Wilk's $\Lambda = .951$, $p\eta 2 = .03$). Differences were found between the Northeast and the South, Midwest, and West for willingness to store firearms safely only.

Significant differences in willingness to store firearms more safely or allow a trusted individual to temporarily store firearms to prevent a loved one's suicide attempt were found for region ($F (2, 253) = 3.221$, $p = .004$; Wilk's $\Lambda = .928$, $p\eta 2 = .04$). Differences were found between the Northeast and the West and the Midwest and West for both willingness to store firearms safely and allow a trusted individual to temporarily store firearms.

Discussion: Our findings indicate that demographic factors including region of residence are critical factors in firearm owners' openness to means safety measures, while ideological factors such as political beliefs may not be. These results provide further context for the development and implementation of efficacious means safety measures capable of overcoming potential demographically-based barriers to adherence.

Poster Session Abstracts

Poster Session I

M1. COGNITIVE-AFFECTIVE CORRELATES OF SUICIDE IDEATION AND ATTEMPT AMONG COLLEGE STUDENTS

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Background: In the biosocial theory of Borderline Personality Disorder (BPD), emotion dysregulation is posited to underlie suicidal behavior among individuals with BPD (Linehan, 1993). Others theorize that preoccupation with negative experience and activation of hopelessness during mood deterioration predict suicide risk among recurrently depressed individuals (Williams et al., 2015). In empirical tests of these theories, attentional instability (i.e., mindfulness) and emotion dysregulation have been found to relate to suicidal ideation among patients and community members (e.g., Law et al., 2015; Shorey et al., 2016). However, there are few studies aimed at refining understanding of the relationship between mindfulness and suicidal behavior of different severity (e.g., suicide ideation versus attempt). In the present study, differences in mindfulness and emotion reactivity, a facet of emotion regulation, are tested in four groups: suicide attempters with recurrent suicidal ideation (SA+SI), suicide attempters without current suicidal ideation (SA only), current suicide ideators with no history of suicide attempt (SI only), and controls. Based on prior research, we hypothesized that mindfulness would be greater among controls. Moreover, given past findings showing emotion dysregulation generally, and emotion reactivity in particular, is associated with suicidal ideation, we hypothesized emotion reactivity would be greater among students with suicidal ideation. A priori hypotheses regarding differences in emotion reactivity and mindfulness among students with suicide attempt and/or suicidal ideation were not made.

Methods: Using an online survey, 672 undergraduate college students completed the Scale for Suicidal Ideation, the Mindful Attention Awareness Scale (MAAS) and the Emotion Reactivity Scale (ERS) and reported on their lifetime history of suicide attempt. Five percent (n=33) were SA+SI, 3% (n=22) were SA only, 12% (n=79) were SI only. A one-way Analysis of Variance (ANOVA) was used to compare differences on mindfulness (MAAS) and emotion reactivity (ERS). Tukey's post hoc procedures were performed to evaluate group differences when the overall F-test was significant.

Results: F-tests for the MAAS and ERS were both statistically significant, $F(3, 654)=11.92$, $p<0.01$ (MAAS) and $F(3, 615)=18.42$, $p<0.01$ (ERS), respectively. Group classification explained 5% of the variance in MAAS scores and 8% of the variance in ERS scores. Post hoc analyses revealed that controls reported greater mindfulness than the SI only group, the SA only group and the SA+SI group (mean MAAS differences between groups= .38 [95% C.I. (.07, .69)], .57 [95% C.I. (.002, .1.15)], .89 [95% C.I. (.42, 1.37)], respectively). Controls reported less emotion reactivity than the SI only group and the SA+SI group (mean ERS differences between groups= 12.16 [95% C.I. (6.23, 18.09)], 19.24 [95% C.I. (10.24, 28.24)], respectively). Demographics (e.g., mean age, proportion White and female) did not differ among groups.

Discussion: Those with any prior suicide attempt or current suicidal ideation reported less mindfulness than controls. In contrast, those with suicidal ideation, regardless of their report of prior suicide attempt, reported greater emotion reactivity than controls. Thus, having a history of suicide attempt or current suicidal ideation is related to more difficulty engaging in mindfulness, suggesting that mindfulness may be a gross marker of suicidality. However, emotion reactivity may be specific to current suicidal ideation. Our findings thus specify the type of suicidal behavior associated with attentional instability and emotion reactivity in college students.

M2. LEARNING AND MEMORY, CHRONIC PAIN, AND SUICIDE

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Background: Suicide is the 10th leading cause of death in the United States and in veteran populations rates of death by suicide have been up to double those in civilian populations (Hoyert & Xu, 2012; Kaplan, Huguet, McFarland, & Newsom, 2007). Previous research has shown that suicidal ideation and suicide attempts (SI/SA) have been linked to chronic pain among other clinical factors (Scott, et al., 2010; Magruder, Yeager, & Brawman-Mintzer, 2012; Ilgen, et al., 2013); as such, chronic pain may contribute to the increased risk of suicide in veterans. While the relationship between chronic pain and suicide remains unclear, an examination of cognitive functioning may help explain the association. For example, cognitive deficits including reduced problem solving skills and memory processing have been reported in individuals with a history of suicidal behavior as well as those with chronic pain. However, many studies have relied on self-report rather than objective cognitive measures. The current investigation sought to examine whether veterans with chronic pain showed reduced performance on objective neuropsychological measures of memory processing. We completed an additional exploratory analysis to examine whether a working memory task differentiated veterans with and without SI.

Methods: Fifty veterans between the ages of 18 and 55 living in the community were recruited from a local VA hospital setting; 38 participants reported chronic pain. Participants completed the Pain Catastrophizing Scale (PCS) and the California Verbal Learning Test, 2nd Edition (CVLT-II). The HAM-A and HAM-D also were administered. In addition we acquired fMRI data during completion of a working memory paradigm in a subgroup of veterans with and without a history of suicidal ideation.

Results: We observed that for participants with chronic pain the PCS was significantly correlated with several of the learning and memory variables: Trials 1–5 ($r = .519$, $p=.001$), Immediate Free Recall ($r=.554$, $p=.001$), Delayed Free Recall ($r =.528$, $p=.001$), and Delayed Cued Recall ($r=.559$, $p=.001$). In addition, none of the neuropsychological scales examined in this study correlated significantly with the measures of mental health functioning (HAM-A, HAM-D). The fMRI data collected during the working memory task indicated that veterans without SI produced significantly greater activation in frontal and temporal areas when compared with veterans with SI (P fwe-corr <.003).

Discussion: These findings suggest that learning and memory are influenced by pain-specific symptoms including pain catastrophizing. Additionally, neurocognitive performance was independent of clinical state measures in veterans with chronic pain. We extended this work by examining working memory in veteran volunteers with and without a history of suicidal

ideation. The neuroimaging data indicated increased activation in frontal–temporal regions during working memory in controls. Future research should examine working memory performance in a chronic pain sample as it relates to risk of suicide.

M3. LIFE OR DEATH? RELATIONS BETWEEN IMPLICIT ASSOCIATIONS WITH DEATH, SUICIDAL BEHAVIOUR, AND THE CENTRAL CONCEPTS OF THE INTERPERSONAL THEORY OF SUICIDE

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Background: Nock and colleagues (2010) developed a suicide version of the implicit association test (suicide-IAT) and demonstrated that patients with mental disorders, who had already attempted suicide, showed stronger implicit associations with 'death' than with 'life' (compared to patients without suicide attempt history). The present study also investigates relations between implicit associations with death and suicidal ideation/behavior and, for the first time, with Thwarted Belongingness, Perceived Burdensomeness, and Acquired Capability, the central concepts of the Interpersonal Theory of Suicide (Joiner, 2005).
Methods: The sample (n=32) consisted of 16 patients with a current Major Depression as well as 16 healthy controls (no prior or current mental disorders or suicidality, matched for age, gender and education). Correlations between the suicide-IAT (d-score) and suicidal ideation/behavior (Beck Scale for Suicide Ideation/Suicide Behaviors Questionnaire-Revised), Thwarted Belongingness and Perceived Burdensomeness (Interpersonal Needs Questionnaire), and Acquired Capability for suicide (German Capability for Suicide Questionnaire) were computed, controlling for depressiveness (Rasch-based Depression Screening) and hopelessness (Beck Hopelessness Scale).
Results: In the entire sample, we found significant moderate to large correlations between the suicide-IAT and suicidal ideation ($r=.41$, $p<.05$), suicidal behavior ($r=.56$, $p<.01$), Thwarted Belongingness ($r=.27$, $p<.05$), Perceived Burdensomeness ($r=.49$, $p<.01$), and Acquired Capability ($r=.25$, $p<.05$). The correlation between the suicide-IAT and suicidal behavior remained stable when controlling for depressiveness and hopelessness (partial correlations; $rp=.36$, $p<.05$), and even suicidal ideation ($rp=.31$, $p<.10$).
Discussion: First, we replicated positive relations between the suicide-IAT and suicidal ideation/behavior as reported by Nock and colleagues (2010). Second, we found positive relations between the suicide-IAT and the central concepts of the Interpersonal Theory of Suicide (Joiner, 2005), especially perceived burdensomeness. Most interestingly, the positive relationship between the suicide-IAT and suicidal behavior remained stable when controlling for depressiveness, hopelessness, and even suicidal ideation, corroborating the incremental validity of the suicide-IAT.

M4. ELECTRODERMAL HYPOREACTIVITY AND THE DEPRESSIVE SUICIDE MAY REPRESENT A COMMON HIPPOCAMPAL DYSFUNCTION

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Background: Several clinical studies of electrodermal hyporeactivity and suicide have unanimously shown a very strong relationship between electrodermal hyporeactivity and suicide and other suicidal behaviors in depressed patients. Hyporeactivity implies the loss of specific electrodermal orienting responses to insignificant tone stimuli in a habituation test. It signifies a failure in creating a detailed memory model of the insignificant stimulus and a loss of normal emotional reactions to it. This represents a failure in the essential ability of "learning the usual". The aim is to discuss Thorell's theory of hippocampal indifference causing a vulnerability to suicide.
Methods: Available studies regarding studies of electrodermal hyporeactivity and suicide in depressed patients was revised, provided that the publications contained only unique data. The studies must include a follow-up period of at least 1 year regarding suicidal behavior.
Results: Four studies fulfilled the requests. The total number of unique patients with a primary diagnosis of depression was 2413. They were collected in different conditions: During the first two pioneer studies (n= 85 together, 6 suicides) (Edman et al., 1986; Thorell, 1987), there was no knowledge of a relationship between hyporeactivity and suicide, and can be considered as blind. The hyporeactivity was independent of the depressed state and time extended for years. During the third study (n= 783, 36 suicides) (Thorell et al., 2013) there was a growing awareness about the relationship and the study can be considered mainly blind. The fourth study, a multicenter study (16 centers in 9 European countries, n= 1545, 9 suicides) (Sarchiapone et al., 2017, not published yet) was a naturalistic open study in which it was encouraged to use the test result in a second suicide risk assessment and for the plans of suicide prevention.
Discussion: In patients who were not selectively targeted by suicide preventive measures (first three studies), the sensitivity of hyporeactivity to suicide was 83 to 100 %. The risk of death by suicide within a year (latest and largest study) was about 0.5 %, i.e. the negative predictive value, raw specificity, was 99.5 %. The number of suicides was significantly reduced to only a third (Sarchiapone, 2017, oral).
If these results represent a valid condition, the observed high sensitivity opens for the claim that the time extended hyporeactivity represents a factor that is almost necessary for the depressive suicide and the observed high raw specificity opens for the claim that reactivity represents a factor that is almost sufficient for preventing the depressive suicide.

Others' research (Sokolov et al. 2002) opens for the possibility that the relationship is linked to a common hippocampal dysfunction. One link is that neurons evoking orienting reactions were found in rabbit in CA1 and CA3 areas of hippocampus. The other link is that suicide is related to deviances in hippocampal anatomy and function which in turn have several causes (review by Dwivedi, 2012).

It is suggested that electrodermal orienting hyporeactivity is a separate neuropsychological dysfunction that may result in a readiness to leave the perceived indifferent life, due to a dysfunction of hippocampal neurons involved in orienting behaviors, and, in an indifference against imminent pain, due to reduced input to amygdala from hippocampus. Thus, according to Thorell's theory of hippocampal indifference, the hyporeactive depressed person is a victim of two severe psychological conditions: A disposition and a capacity to leave life, both being explainable by one dominating common factor – dysfunctional hippocampal orienting.

M5. NEUROCOGNITIVE RISK FACTORS DETECT PAST-YEAR SUICIDE ATTEMPT AMONG VETERANS AT HIGH-RISK FOR SUICIDE

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Background: Establishing new targets for suicide risk assessment and intervention is critical for developing clinical innovations for the care of high-risk patients. Part of the Veterans Health Administration (VHA) strategy for reducing suicide involves identifying and providing enhanced care to Veterans at high-risk for suicide. However, suicide risk assessment is complicated by the fact that risk factors tend to be ubiquitous in high-risk groups and therefore offer limited specificity in determining risk. For example, previously identified factors (e.g., mental health diagnosis, substance use, previous suicide behavior, hopelessness) would be largely present in mental health settings and particularly in groups identified as high-risk for suicide. Thus, factors that can differentiate risk among individuals already known to be at high-risk for suicide are needed to improve planning and clinical management. Holding such promise, several studies have shown that neurocognitive tests can differentiate groups who have attempted suicide from a variety of comparisons groups who have not attempted suicide. The present study aims to extend this previous research by examining whether neurocognitive tests can detect a recent suicide attempt, within a group of Veterans who nearly all have a lifetime history of suicide behavior.

Methods: Participants were Veterans (n=117) considered at high-risk for suicide, evaluated after an index suicide event, ranging from severe suicidal ideation to suicide attempt. Data were derived from clinical interviews (suicidal thoughts and behavior, psychiatric diagnosis, and history of aggressive behavior); self-report questionnaires (depression, hopelessness, impulsivity); and computerized neurocognitive testing of attention (Stroop tests), impulsivity (Go- No Go), and memory recognition. The key study outcome was whether a suicide attempt occurred during the past year. Hierarchical logistic regression was applied to examine the added value of neurocognitive factors, relative to established factors (e.g., suicidal ideation), on detecting past year suicide attempt.

Results: Nearly all participants (93.2%) had some form of lifetime suicide behavior (actual/aborted/interrupted attempt, preparatory behavior) and the majority had a previous suicide attempt (60.8% past-year/82.9% lifetime). Several established (suicidal ideation, diagnosis, history of aggressive behavior) and neurocognitive factors (attention, impulsivity) were significantly associated with past-year suicide attempt in univariate analyses. Multivariate analyses showed that poorer neurocognitive performance was significantly associated with past-year suicide attempt, adjusting for psychiatric diagnosis and the effects of established risk factors. Also, the model with neurocognitive factors significantly added to model with established factors in detecting past year suicide attempt.

Discussion: Results extend previous neurocognitive findings by showing their ability to differentiate risk within a sample that represents the very high end of the suicide risk spectrum, with nearly all reporting suicide behavior. In doing so, current results show that neurocognitive tests of attention functioning and impulse control hold promise for the clinical assessment of individuals already known to be at high-risk for suicide. The current results also highlight impulsivity and attentional functioning as potential targets for intervention.

M6. PATTERNS OF SOCIAL NETWORKS AND COPING WITH DEAF COLLEGE STUDENTS

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Background: The socioecoglocal model helps to conceptualize how suicide risk factors that influence the general population and suicide risk factors that are specific to the experience of having hearing loss impact d/Deaf & hard-of-hearing (d/DHH) people. d/DHH people have higher risk for suicide behaviors than hearing people (Boyechko,1992; Critchfield, et al.,1987; Dudzinski,1998). Compared with hearing people, d/DHH people have relatively lower quality of life (Lewis, et al., 1992), increased mental distress (Lewis & Stephens, 1995), lower educational attainment (Lewis, et al., 1994), lower socioeconomic status (Leigh, et al., 1988; Leigh, et al., 1989), lack stable employment (Lewis, et al., 1992), higher rates of untreated psychopathology (Watt & Davis, 1991), and higher risk of substance abuse (Marcus, 1991).

Other suicide risk factors may be specific to the experience of deafness including lack of role models, social isolation, increased risk of abuse, self image problems, parent and child separation, relationship troubles (Critchfield, et al., 1987), hearing-related medical problems (De Leo, et al., 1999), fund of information gaps, language development problems, and aacculturation stress (Dudzinski, 1998). Suicide behavior rates disparities between d/DHH and hearing people stem from inequalities in socioeconomic, educational, and psychological factors that affect quality of life and mental health.

Suicide is a leading cause of death among college and university students in the US (Schwartz, 2006; Suicide Prevention Resource Center, 2004). Many college and university campuses are establishing suicide prevention programs (Suicide Prevention Resource Center, 2014). New d/DHH university students face attrition (Boutin, 2008; Gore, et al., 2005), high dropout rates (Stinson & Walter, 1997), depression (Leigh, et al., 1989), and loneliness (Murphy & Newlon, 1987).

Ethical and methodological challenges (e.g. limited linguistic and cultural accessibility of measures, no single sign for 'suicide', etc.) and solutions (e.g. cognitive interviews, research, community based participatory research, etc.) in suicide research with d/DHH people will be explained and provide context for the research project. Suicide prevention work with d/DHH people is sparse and the need for adapted evidenced based suicide prevention practices is obvious. Drawing upon social learning theory, the elaboration likelihood model, and network health diffusion model; this research project aims to gather information to inform an culturally specific adaptation of the Sources of Strength program with d/DHH college students.

Methods: This project included 4-5 cognitive interviews and approximately 25 semi-structured interviews with d/DHH college students in sign language. Interviews gathered data to 1) understand d/DHH college students' social network characteristics related to peer leaders, ties to mentors, and campus affiliations and 2) understand d/DHH college students' perspectives on natural coping resources.

Results: Themes regarding d/DHH college students' social network characteristics and natural coping resources as well as piloted cognitive interview feedback that was used for research development will be shared. Associations between data and theory that inform plans to adapt the Sources of Strength program with d/DHH college students will be discussed.

Lessons learned in the challenges of specialized research with d/DHH people will be explained.
Discussion: Plans for additional research to understand other aspects for program adaptation and Sources of Strength program adaptation plans will be described. This project's contributions to developing research methodology with d/DHH people will be explained.

M7. ADAPTING TOOLS TO ASSESS SUICIDALITY IN ADULTS WITH AUTISM SPECTRUM CONDITIONS

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Background: A growing body of research is showing significantly increased rates of suicidality in adults with Autism Spectrum Conditions (ASC). However, it is unclear whether there are any validated tools available to effectively assess suicidality in those with ASC. The mental health in autism project thus aims to identify and/or develop a new validated tool to effectively assess suicidality in adults with ASC for future research and clinical practice.
Methods: The first stage of the research program conducted a two stage systematic review to identify tools used to assess suicidality in those with and without ASC, and assess these tools for their appropriateness and measurement properties using the COSMIN checklist. Subsequently, two focus groups, and 30 individual cognitive interviews with adults with ASC were undertaken to inform adaptations to the measure identified from this review, to ensure the questions are clear and relevant to this group.
Results: The systematic review revealed that no tools with evidence of validity have been utilised to assess suicidality in those with ASC. However the SBQ-R had robust evidence for its psychometric properties in the general population, and was taken forward to be adapted for adults with ASC in the next stage. Themes were identified from the focus groups and cognitive interviews regarding differences and difficulties in the interpretation of questions from the SBQ-R, and proposed solutions. These included adapting the language to improve the sensitivity of the questions, relevance of the response options, and clarity of the questions and response options.
Discussion: Adults with ASC reported difficulties with the language of the SBQ-R, which reduced the accuracy of the tool in successfully identifying suicidality in this group. For example, difficulties in imagining what one will do in the future impeded ability to answer question four of the SBQ-R: "How likely are you to attempt suicide someday?" Adaptations are thus proposed to the SBQ-R in order to more effectively assess suicidality in adults with ASC in future research and clinical practice.

M8. ETHNIC VARIATIONS OF TRAJECTORY IN SUICIDE IDEATION AND ATTEMPT: FROM MIDDLE SCHOOL TO HIGH SCHOOL

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Background: Previous studies of adolescent suicide behavior have focused primarily on European American populations (EA). It is unknown whether currently available estimates of the prevalence and risk factors for suicide ideation and attempts generalize to adolescents from other racial and ethnic groups. The purpose of this study was to compare patterns of suicidal ideation and suicide attempt in three racial/ethnic groups.

Methods: Data for the study were drawn from the Developmental Pathways Project (DPP), including seven longitudinal assessments at 6th grade, and 6-month, 12-, 18-, 36-, and 72-month follow-up. We analyzed data from 463 students with racial/ethnic backgrounds of EA (N=232), African American (AA; N=143), and Asian American (ASA; N=88). A Suicide Ideation Risk Scale (SIRS) was developed based on three items: thoughts of death and dying, feeling that life is not worth living, and having thoughts of killing oneself. Lifetime history of suicide attempt was measured at 12th grade. Data were analyzed with Growth Mixture Modeling (GMM).
Results: For all three racial/ethnic groups, the best fit model was a three-trajectory class model. The majority of adolescents (85% of AA, 80% of ASA, 90% of EA) belonged in the no-ideator trajectory, demonstrating little to no ideation across all time points. For the AA group, the moderate ideators trajectory (12%), demonstrated a low level of ideation at the baseline and increased gradually until 9th grade. The high ideators trajectory (4%), demonstrated a precipitous increase from 6th to 9th grade, then stayed at the highest level of ideation among all three groups throughout the high school years. For the ASA group, the increasing ideators trajectory (13%), started with low ideation and gradually increased during the seven assessment points. The high fluctuating ideators trajectory (8%), showed U-shape, peaking at baseline and 12th grade and reaching the lowest point at 9th grade. For the EA group, the ideators trajectory (6%) was characterized by a gradual increase in ideation throughout middle school years. The high-decreasing ideators trajectory (3%), demonstrated a very high rate of ideation at baseline and decreased dramatically over the middle school years, then increased during high school.
The proportion of students who had a lifetime history of suicide attempt for AA, ASA, and EA was 7%, 9%, and 5%, respectively. In the AA group, being a member of moderate ideators or high-ideators was not a significant predictor of suicide attempt. In ASA group, being a member of increasing ideators did not predict suicide attempt, while being a member of high fluctuating ideators was a significant predictor. In the EA group, being a member of ideators or high-decreasing ideators predicted suicide attempt reported in 12th grade.

Discussion: Although a three-class model was the best fit for all three racial/ethnic groups, timing of onset, patterns of change over time, and peak time in the ideator trajectories were markedly different. Unique for AA ideators, the duration of high ideation was much higher and much longer than that in other ethnic groups. ASA high fluctuating ideators showed a high level of ideation with a fluctuating U-shaped pattern. In EA youth the onset of suicidal ideation and its peak could be earlier than we previously assumed. Although the proportion of students who had attempted suicide was higher in ASA/AA than that of EA, the high level of attempts found in ASA/AA group was not explained by having suicide ideation. Findings suggest the need for in-depth examination of suicide behaviors across racial/ethnic groups and culturally adapted preventive efforts with distinct developmental timing for adolescents from different racial/ethnic backgrounds.

M9. AN EXAMINATION OF RACIAL MICROAGGRESSIONS, THE INTERPERSONAL THEORY OF SUICIDE, AND SUICIDE IDEATION IN AN AMERICAN INDIAN SAMPLE

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Background: American Indians (AIs) experience the highest suicide rates of all ethnic groups (CDC, 2015). Although overt racism has decreased since the 1960s, modern racism is prevalent via racial microaggressions. Racial microaggressions (RMs) are verbal, behavioral, and environmental slights directed to persons of color (Sue et al., 2007). Six identified RMs dimensions are invisibility (feeling devalued/ignored), criminality (stereotyped as a criminal or threatening), low-achieving/undesirable culture (viewed as incompetent, success due to unfair advantage), sexualization (oversexualized/eroticized), foreigner/not belonging (viewed as an immigrant or not a "true" American), and environmental invalidations (negative environmental messages about one's race; Torres-Harding et al., 2012). RMs have been linked to suicide for people of color (O'Keefe et al., 2015) and specifically in African Americans (Hollingsworth et al., 2017). Given AIs have high suicide rates, it is important to study if RMs increase suicide risk. Since this was the first study to test the relationship between RMs and suicide ideation exclusively in AIs, relationship hypotheses were exploratory. The Interpersonal Theory of Suicide (ITS; Joiner, 2005) posits suicidal desire develops when thwarted belongingness (TB), feeling socially disconnected, and perceived burdensomeness (PB), feelings of burdening others, are concurrently experienced. In line with previous work with African Americans (Hollingsworth et al., 2017), it was hypothesized that TB and PB would mediate the relationship between RMs and suicide ideation.
Methods: Participants were 127 self-identified AI college students, 88 females and 39 males, who represented 23 different tribes. Participants' ages ranged from 18 to 48 (M = 20.07). These self-report measures were completed online: RMAS (Torres-Harding et al., 2012); INQ-15 (Van Orden et al., 2012); and HDSQ-SS (Metalsky & Joiner, 1997).
Results: Bivariate correlations were used to test the relationships of RMs with TB, PB, and suicide ideation. Of the six RMs dimensions, results indicated that foreigner/not belonging ($r = .25$, $p < .01$) and environmental invalidations ($r = .25$, $p < .01$) were positively associated with TB, and foreigner/not belonging ($r = .24$, $p < .01$) and environmental invalidations ($r = .23$, $p < .01$) were positively associated with PB. Findings also revealed that criminality ($r = .22$, $p < .05$), sexualization ($r = .25$, $p < .01$), low-achieving/undesirable culture ($r = .19$, $p < .05$), and foreigner/not belonging ($r = .19$, $p < .05$) were positively associated with suicide ideation. Six bootstrapped mediation analyses with two mediators and 5,000 re-samples were conducted to test hypothesized indirect effects. Estimates revealed that environmental invalidations had an indirect effect on suicide ideation through TB (point estimate = 0.20, BCa = 0.0003 to 0.07), but not PB (point estimate = 0.002, BCa = -0.02 to 0.02). The remaining five RMs dimensions did not indirectly influence suicide ideation through TB or PB.
Discussion: Results indicate that for AIs, experiencing certain types of RMs (foreigner/not belonging and environmental invalidations) were associated with increased thwarted belongingness and perceived burdensomeness. Findings also revealed an indirect relationship between negative environmental messages about one's race (environmental invalidations) and suicide ideation through increased social disconnection (TB). Results provide important clinical implications, which may include incorporating the assessment of racial microaggressions in suicide risk assessments with AI clients. Societal implications involve educating the public on the existence and negative impact of these racial slights.

M10. THE ROLE OF RUMINATION AND IMPULSIVITY IN THE RELATIONSHIP BETWEEN EARLY LIFE STRESS AND SUICIDAL THOUGHTS AND BEHAVIORS

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Background: Research suggests that early life stress may contribute to the tendency to ruminate in response to distress (Michl, McLaughlin, Shepherd, & Nolen-Hoeksema, 2013). Characterized by passive, perseverative dwelling on low mood, the brooding subtype of rumination may promote impulsivity by compromising one's ability to generate alternative solutions. Both rumination and impulsivity have been associated with a number of negative psychological and behavioral outcomes, including suicidal thoughts and behaviors (SITBs). The present study assessed the mediating influence of subtypes of rumination and impulsivity in the relationship between early life stress and SITBs.

Methods: Participants were 452 college students (351 females), ages 17-43 (M = 19.10, SD = 3.28) from a public college in the northeastern U.S. The racial/ethnic distribution of the sample was 39% Asian, 23% White, 19% Hispanic/Latino/a, 7%, Black, and 9% Other. Participants completed self-report measures of early life stress (Early Trauma Inventory-SF), impulsivity (a shortened version of the UPPS impulsive behavior scale), rumination (Ruminative Responses Scale), and suicidal ideation and attempts (Suicide Behavior Screening).

Results: Early life stress was associated with brooding, $r = .298$, $p < .01$, and reflection, $r = .238$, $p < .01$. There was a relationship between rumination and impulsivity: Negative urgency was associated with both brooding, $r = .397$, $p < .01$, and reflection, $r = .178$, $p < .01$, and poor perseverance was associated with brooding, $r = .142$, $p < .01$, but not reflection. A multinomial logistic regression was conducted to examine whether early life stress, rumination, and impulsivity predict SITBs, with No SITBs as the reference group. Early life stress was associated with higher odds of Ideation Only (O.R. = 1.12, 95% CI = 1.04-1.21), Attempt Only (O.R. = 1.21, 95% CI = 1.10-1.34), and Ideation and Attempt (O.R. = 1.35, 95% CI = 1.16-1.57). Brooding predicted Ideation and Attempt (O.R. = 1.27, 95% CI = 1.00-1.60), and reflection was associated with higher odds of Ideation Only (O.R. = 1.16, 95% CI = 1.04-1.29) and Ideation and Attempt (O.R. = 1.32, 95% CI = 1.06-1.64). Poor perseverance was associated with higher odds of Ideation Only (O.R. = 2.26, 95% CI = 1.19-4.28). A serial mediation model tested through PROCESS revealed that poor perseverance mediated the relationship between early life stress and Ideation Only, but only if it was preceded by brooding or reflection.

Discussion: Early life stress may increase the risk for rumination, which may promote impulsivity by depleting cognitive resources that can aid with planning. Although previous research has shown that the reflection subtype of rumination tends to be more adaptive than brooding, early life stress may compromise some of the adaptive features of reflection and contribute to suicidal risk.

M11. DEVELOPMENT AND EVALUATION OF A SPANISH-LANGUAGE VERSION OF THE INTERPERSONAL NEEDS QUESTIONNAIRE

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Background: Although Hispanics have historically been at decreased risk for suicide in the U.S., rates have risen notably in the last decade. Linguistically and culturally sensitive Spanish-language measures assessing risk factors for suicide are lacking. The present study reports the multistage psychometric development and evaluation of a Spanish translation of the Interpersonal Needs Questionnaire (INQ). The INQ measures the constructs of thwarted

belongingness and perceived burdensomeness, which the interpersonal theory of suicide (Joiner, 2005) proposes are proximal causes of suicidal desire. Ongoing qualitative analyses, guided by findings from psychometric analyses and exploring the construct of belonging further, are also presented.

Methods: The English-language INQ (Van Orden et al., 2012) was translated into Spanish by the primary author and reviewed by three independent Spanish-speakers. Back-translation was conducted by an independent Spanish-speaker blind to the English measure. Discrepancies were discussed and resolved by consensus. Language effects, factor structure, measurement invariance, and criterion validity of the translated measure were examined across different Spanish-speaking samples. Participants were bilingual college students (n=56), young adult heritage Spanish speakers (n=238), adults from Spain (n=1,016), and inpatients from Mexico (n=138). Qualitative analyses with an independent sample are being conducted as psychometric analyses indicated that thwarted belongingness may be understood differently by Spanish-speakers. In-depth individual interviews have been completed with 3 bilingual Hispanic women and preliminary thematic analyses using the Grounded Theory approach are presented. We expect to conduct approximately 20 more qualitative interviews with Spanish-speakers to aid with further refinement of the measure.

Results: Initial translation procedures indicated that certain items measuring thwarted belongingness did not translate directly into Spanish (e.g., "care" translated as "worry"). Results indicated that the original (i.e., English measure) 15-item two-factor measurement model provided poor to borderline acceptable fit across the Spanish-speaking samples from the U.S., Spain, and Mexico. Instead, an 11-item two-factor solution (INQ-S-11) provided acceptable to good fit across the samples. Multigroup analyses were consistent with invariance for American vs. foreign students and non-clinical vs. clinical samples. Finally, both subscales demonstrated concurrent associations with suicidal ideation. Qualitative analyses examining the construct of belonging indicated that participants defined belonging as "being a part of" something, as opposed to frequency of contact or reciprocal care. Specifically, thematic analyses indicated that belonging was experienced as having a sense of (1) home and (2) cultural identity. A lack of belonging was often discussed as feeling (3) isolated and (4) different from the local Hispanic community.

Discussion: The current study is the first to develop and evaluate a Spanish language version of the INQ. The development of a valid and reliable Spanish measure of well-known suicide risk factors can promote research, as well as provide a means to identify treatment targets or measure outcomes, among Spanish-speakers. Full qualitative results will be used to further improve the measure and more accurately capture the construct of thwarted belongingness among Spanish-speakers. Understanding how Hispanic adults experience, express, and satisfy interpersonal needs can help healthcare providers develop culturally-appropriate services for those struggling with thwarted belonging or perceived burdensomeness.

M12. MENTAL HEALTH SERVICE UTILIZATION AMONG ASIAN AMERICANS WITH SUICIDAL IDEATION

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Background: Converging evidence suggests that Asian Americans tend to underutilize mental health services compared with other racial and ethnic groups. This tendency to refuse help, or to delay entering treatment until it is too late, could be dangerous for those at risk for suicide in this population. Those with prior history of suicidal ideation are at particularly

elevated risk of making suicide attempts. Thus, the current study aims to study a sample of suicidal Asian Americans and identify factors that predict mental health service utilization.
Methods: Survey data from 191 self-identified Asian American adults (Mean age = 36.29, SD=13.76) with a history of suicidal ideation were drawn from the 2002-2003 National Latino and Asian American Survey (NLAAS). Bivariate logistic regression analyses were conducted to predict mental health service utilization, using relevant socio-demographic, clinical, or culturally relevant variables as predictors.
Results: Results identify specific factors that statistically predict which suicidal Asian Americans utilize mental health services. Bivariate logistic regressions indicated that being female, perception of having a mental health problem, perception of needing treatment, English language ability, family cohesion, family conflict, number of DSM diagnoses, and number of parents born in USA were significant positive predictors of professional mental health treatment (ORs=1.15-7.47, CIs=1.01-15.38, ps<.05), while Asian language ability, being born outside of the US, subjective ratings of good mental health, social support among friends, social support among extended family, and social strain among extended family were significant negative predictors of professional mental health treatment (ORs=0.42-0.73, CIs=0.23-0.98, ps<.05). Variables such as age, household income, educational level, and religion were not significant predictors of service utilization in this sample (ORs=0.82-1.23, CIs=0.58-1.91, ps>.05).
Discussion: This study highlights gender, quality of social networks, language, and generational status as culturally relevant predictors of whether or not suicidal Asian Americans use professional mental health services. Results support past research showing that females have more favorable help-seeking attitudes than males, and that higher levels of acculturation (i.e. English language proficiency) positively predict mental health treatment utilization, while higher levels of enculturation in Asian values and customs negatively predict professional help-seeking. Subsequent analyses will enter these distinct factors into a multivariate model.

M13. VIOLENCE PREDICTS SUICIDALITY: RACE/ETHNIC SPECIFIC ANALYSES

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Background: Research on the link between violence and suicidality has a series of limitations including a neglect of race-specific analyses, tenuous theoretical development, reliance on specialized samples such as prisoners and mental patients, and relatively small samples. In response to these issues, the present study uses a large national representative sample and applies a construct from Joiner's interpersonal theory of suicide, capability for suicide, to assess the link between violence and suicide attempts for three racial groups. Background. Experience with violence is assumed to increase the capability for suicide through a desensitization process towards physical pain. Fear of pain can prevent suicide in otherwise suicidal persons such as those lacking in belongingness. However, from the standpoint of social control theory of criminology & deviant behavior, the degree of the association between exposure to violence and suicidality will vary according to subcultural values. In particular, racial/ethnic diversity in values, which act as buffers against suicide (suicide acceptability and religiosity), would moderate the association between violence exposure and suicidality. Ethnic and racial minorities, being lower in suicide acceptability

and higher in religiosity than Caucasians, would be expected to have a weaker relationship between violence exposure and suicidality.
Methods: All data are taken from the Youth Risk Behavior Survey (YRBS) of 2013. The YRBS is based on a nationally representative sample of 13,583 students. Suicidality is measured as a self reported attempt during the previous 12 months. Violence is measured as involvement in one or more fights where the respondent required medical treatment for the injuries sustained. Controls are incorporated for factors which may mediate the link between violence and suicide attempts. These include psychiatric morbidity (e.g., major depression with 12 month prevalence), substance abuse (use of cocaine, marijuana, and binge drinking), risky sexual behavior (e.g., unsafe sex, number of partners), school integration (e.g., sports team member), and demographic controls (e.g., age, gender). Complete data were available for three large racial groups: Caucasian Americans (N=5,301), non Hispanic African Americans (N=2,738), and Hispanics (N=3,223). Since the dependent variable is a dichotomy, multivariate logistic regression techniques are appropriate.
Results: For Caucasians, controlling for the other variables, fighting was associated with 3.29 times higher risk of a reported suicide attempt (Adjusted Odds Ratio= 3.29, p=.0000). Other significant predictors included major depression (aOR=12.3, p=.0000). For non Hispanic African Americans, controlling for the other variables, fighting was associated with risk of a reported suicide attempt (aOR= 2.16, p=.0138). Other significant predictors included major depression (aOR=6.4, p=.0000). For Hispanics, fighting was associated higher risk of a reported suicide attempt (aOR= 2.9, p=.0000). The models provided reasonable fit to the data. Nagelkerke r-squared statistics were .342, .220, & .291. The percentage of cases correctly classified were 94.1, 93.7, & 91.1.
Discussion: As anticipated, the association between violence exposure and suicidality is significantly stronger for Caucasians relative to minority groups. Further work is needed to rigorously test the extent to which cultural constructs are responsible for the diversity in the findings. The results provide the first systematic evidence that the link between violence and suicidality exists for each major racial group. The findings are consistent with Joiner's theorem that links capability to suicidality.

M14. APPLYING MACHINE LEARNING TECHNIQUES TO IDENTIFY QUALITY AND STAFFING MEASURES ASSOCIATED WITH VETERAN HEALTH ADMINISTRATION FACILITY SUICIDE RATES IN 2013-2014

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Background: Suicide prevention is a priority for the Veterans Health Administration (VHA). Little is known regarding variation in rates across VHA facilities or patterns of association with facility characteristics and quality indicators. We examined variation in suicide rates across VHA facilities and identified quality indicators and facility measures that may explain this variation.
Methods: For VHA patients in user cohorts for 2013 and 2014, we assessed facility-specific suicide rates using ordinary least squares regression, including as covariates facility size, age and sex distributions, region, state-level suicide rates among non-VHA users, mental health staffing ratios, and VHA quality indicators from the Mental Health Information System (MHIS). Using LASSO regression, we selected quality indicators for inclusion in the model.
Results: Facilities in the West (versus the Midwest) and those in states with higher suicide rates had significantly higher suicide rates ($p<0.001$). Those with greater receipt of mental

health treatment among patients with service connected disabilities had lower suicide rates (p=0.02). Greater receipt of benzodiazepines among patients with PTSD and receipt of residential rehabilitation services among patients with serious mental illness were associated with higher suicide rates (p=0.04; p=0.01, respectively). Greater mental health staffing ratios were associated with lower suicide rates (p=0.04). Overall, the model explained 41.2% of variation in facility-level suicide rates.
Discussion: Study analyses identify systematic associations between contextual factors, modifiable facility factors, and facility suicide rates in the VHA. Findings on quality indicators are complex, suggesting they may be mediated through their impact on case mix as well as outcomes.

M15. BROODING DIFFERENTIALLY PREDICTS STRESS-MEDIATED MOOD REACTIVITY IN INDIVIDUALS WITH OR WITHOUT A HISTORY OF NON-SUICIDAL SELF-INJURY

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Background: Every year over 800,000 people die by suicide (WHO, 2016). Non-Suicidal Self-Injury (NSSI), conceptualized as self-injury in the absence of suicidal intent, often precedes and increases risk for suicide (Hamza et al., 2012). Individuals who engage in NSSI are more emotionally and physiologically reactive to stress (Nock & Mendes, 2008; Nock et al., 2008), and may engage in NSSI to regulate their distress (Nock & Prinstein, 2004). Depressive rumination, or the tendency to repetitively focus on the causes, meanings, and consequences of one's symptoms of distress increases risk for suicide and self-injurious behaviors (Miranda & Nolen-Hoeksema, 2007; Polanco et al., 2015). Research has suggested that the two subtypes of depressive rumination: brooding, a tendency to dwell on symptoms of distress or negative mood, and reflection, a tendency to try to understand the reasons for depressed mood and to engage in cognitive problem solving to improve one's mood, are differentially related to self-harm behaviors (Polanco et al., 2014; Treynor et al., 2003). What is not known is whether the relationship between these ruminative subtypes and stress-mediated mood reactivity differs, and if so, whether this difference is influenced by NSSI history. The current study examined whether brooding and reflection are positively associated with stress-mediated mood reactivity, and whether these relationships are stronger among individuals with a history of NSSI.
Methods: Following initial screening, 30 young adults (M age= 21.13, SD = 2.66; 83.3% female) were recruited for a laboratory study to examine stress-mediated mood reactivity and self-harm. The Self-Injurious Behaviors Interview (SITBI; Nock et al., 2007) was administered to participants with (n = 18), and without (n = 12) a history of self-harm in order to assess for history of NSSI. Participants completed the Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991), and the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). To assess for mood reactivity, participants completed a computerized social stress task (Cyberball; Williams et al., 2012) and provided self-reports of their mood using the Visual Analogue Scale (VAS; Aitken, 1969) before and after the social stress task.
Results: Independent samples t-tests showed that the NSSI group was more likely to engage in reflection, $t(28) = -3.48$, $p = .002$, and brooding, $t(25.01) = -6.18$, $p < .001$ than the control group. The NSSI group also endorsed higher levels of suicidal ideation, $t(17.08) = -.4.54$, $p < .001$, and a sadder mood at baseline, $t(28) = 3.47$, $p = .002$.

A multiple linear regression analysis examining predictors of stress-mediated mood reactivity in response to the stress task found that only the two-way interaction between brooding and NSSI history predicted stress-mediated mood reactivity in the full sample, b = -5.84, SE = 2.74, partial r = -.39, p = .043.

Separate linear regression analyses were run by group, and brooding positively predicted stress-mediated mood reactivity among the control group, b = 3.11, SE = 1.24, p = .031, but, counter to expectations, brooding negatively predicted stress-mediated mood reactivity among the NSSI group, b = -2.63, SE = 1.05, p = .024.

Discussion: Individuals in the NSSI group were more likely to engage in both subtypes of rumination, endorsed greater sad mood at baseline and higher levels of suicidal ideation. In line with expectations, brooding was detrimental for individuals without a history of NSSI; however, unexpectedly, it was protective for the NSSI group. While it is possible that brooding among those who engage in NSSI is beneficial, particularly in the short term, results are preliminary and will be updated as data collection is ongoing.

M16. WOMEN AND SUICIDE: DEPRESSION OR OPPRESSION

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Background: The issue of women and suicide has not yet received its due attention in the field of suicidology. Despite the outbreaks in many parts of the world such as China, Turkey and now Pakistan, there is dearth of literature to understand the social determinants of suicide from gender perspectives.
The study presents a gender analysis of suicide cases in the Ghizer district of Pakistan, where suicide rates are unexpectedly high since 2000.

Methods: The paper reports the incidences of suicide from 2000 -2017 in Ghizer district of Gilgit-Baltistan.The total population of the district is .09 million. Using mix methods, the data has been gathered from primary sources (life history of suicide survivors n= 9) and secondary sources including police records, newspapers and previously published literature.
Results: A total of 261 completed cases have been reported during fifteen years. The victims range from 11 -80 years. Youth from 16-25 years age groups account for 58% of total cases. The second vulnerable group is 26-35 years which account for 17%. Children under 15 years account for almost 7% of the total. In these entire categories female ratio is higher than male. The ratio of unmarried girls is disproportionately high compared to married women. The common methods among women are jumping from height and hanging, while use of gun in common among men
Discussion: The findings reveal a sharp difference in methods and isk factors among men and women. The findings suggest that the patriarchal social norms and structures are the key factors behind suicide in women. Several cases in the study reveal that suicide has been the only best option after a thoughtful evaluation of choices and social circumstances. In conclusion, the data indicates that social forces at work in terms of women and suicide which suggest prevention approaches need to address oppressive social conditions

M17. IMMUNE MARKERS PREDICT DEATH BY SUICIDE IN A LONGITUDINAL COHORT OF 1393 PERSONS WITH SERIOUS MENTAL ILLNESS

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Background: Although clinical risk factors for death by suicide such as an attempt history are well established, they are limited in terms of predictive value for identifying risk at the level of the individual. Previous studies show an association between immune markers and a history of suicide attempts but few studies have examined these markers prospectively in relation to death by suicide. Patients with serious mental illnesses such as schizophrenia and mood disorders are at high risk for suicide so more objective predictors of suicide risk in these patients are particularly needed for these individuals.

Methods: Patients with schizophrenia, bipolar disorder, and major depression receiving psychiatric care from a large psychiatric health system in Baltimore, MD were enrolled into the study cohort starting in 1999. Data collected at baseline included demographic and clinical variables as well as health behaviors and medical co-morbidities. Each participant had a blood sample drawn from which were measured antibodies to herpes viruses and toxoplasma gondii, a parasite. The death status of participants at the end of the study period was determined with data from the US National Death Index as of December 31, 2015. Patients who died from self-harm were identified as well as those who died from other causes. Multiple logistic regression analyses were used to determine predictors of suicide death comparing the participants who died by suicide with the participants who were still living.

Results: A total of 1393 persons were enrolled in the study of whom 799 had a diagnosis of schizophrenia, 518 a diagnosis of bipolar disorder, and 76 a diagnosis of major depression. The mean age of the participants at baseline was 37.9 years (sd=12.7); 700 (50.2%) were male and 901 (64.7%) were Caucasian. The mean follow-up interval was 8.3 years representing 11,325 person years. Per the National Death Index data, a total of 16 persons died from definite or possible self-harm and 1284 were alive at the end of the follow-up period. The remaining 93 persons in the cohort died from other causes. The deaths by suicide took place on average 2018 days (range 18 – 4961 days) after the baseline evaluation. Compared with the persons who were still alive, the persons who died by suicide were more likely to be male (OR=4.3, 95% CI 1.2, 15.3, p=0.022), Caucasian (OR=8.7, 95% CI 1.3, >50, p=0.037), and cigarette smokers (OR=3.2, 95% CI 0.96, 13.6, p=0.036). They were also more likely to have a schizophrenia diagnosis (OR=3.5, 95% CI 0.9, 19.2, p<0.039). Adjusting for demographic and clinical variables, the death by suicide group had elevated levels of IgG class antibodies to Toxoplasma gondii (for definite suicide group OR=1.9, 95% CI 1.2, 3.3, p=0.013, for definite and possible suicides OR=1.5, 95% CI 0.9, 2.4, p=0.122) and to Cytomegalovirus (for definite suicide group OR=1.8, 95% CI 1.2, 2.6, p=0.002, for definite and possible suicides OR=1.6, 95% CI 1.2, 2.0, p=<0.001) but not to the other human herpes viruses such as Herpes Simplex Virus Type 1 or Epstein Barr Virus.

Discussion: Our results document an increased rate of death by suicide associated with cigarette smoking and a schizophrenia diagnosis among individuals with serious mental illness in our research cohort. We also found an association between exposure to specific infectious agents and subsequent increased rate of death by suicide in this population. Reasons for the association with Cytomegalovirus and Toxoplasma gondii are not known with certainty but may be related to the effect of these agents on the brain or the immune system. The better identification of biological markers in individuals at risk of suicide may lead to improved methods of suicide prevention and treatment.

M18. SUICIDE AMONG IMMIGRANT POPULATION IN NORWAY: A NATIONAL REGISTER-BASED STUDY

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Background: With a steady increase in residential mobility across borders in contemporary society, the psychosocial well-being of immigrants has become of increasing interest for suicide research. The aim of this study was to investigate differences in suicide risk among immigrant population in Norway compared with native Norwegians, with respect to associated country group of origin.

Methods: A population-based nested case-control design was adopted using Norwegian national longitudinal registers to obtain 23,073 suicide cases having occurred in 1969-2012 and 373,178 controls. Odds ratios (ORs) for suicide were estimated using conditional logistic regression analysis adjusting for socio-economic factors.

Results: Compared with persons born in Norway with two Norwegian-born parents (native Norwegians), suicide risk was significantly lower in first- and second-generation immigrants but higher in Norwegian-born with one foreign-born parent and foreign-born individuals with at least one Norwegian-born parent. When stratifying data by country group of origin, first-generation immigrants had lower ORs in most of the strata. Subjects born in Asia and in Central and South America with at least one Norwegian-born parent had a significantly higher risk of suicide. The observed results remained mostly unchanged in the analyses controlled for personal differences of socio-economic status.

Discussion: Suicide risk is lower in first- and second-generation immigrants but higher in subjects born in Norway with one foreign-born parent and those born abroad with at least one Norwegian-born parent, with notable differences by country group of origin. The findings of this study call for a strengthening of suicide-preventive measures and mental healthcare services for immigrant populations.

M19. RISK FACTORS FOR SUICIDE IN OFFSPRING BEREAVED BY SUDDEN PARENTAL DEATH FROM EXTERNAL CAUSES

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Background: Although the majority of people who have experienced sudden parental death due to external causes return to their normal life functioning following a period of grief, research has consistently reported that bereaved offspring have an elevated risk of suicide. The reasons for the variation in responses to loss are, however, largely unknown, and the ability to identify specific individuals at risk of suicide on the basis of risk and protective factors is limited. The present study aimed to investigate to what degree different interpersonal, intrapersonal and bereavement-related factors influence suicide risk in offspring bereaved by parental death from external causes.

Methods: We retrieved individual data from three Norwegian longitudinal registers and merged them by means of the personal identification number. The study is based on the national cohort of all individuals who experienced parental death due to external causes. In this bereaved cohort, we identified 375 cases who died from suicide at an age of 12 to 65 years old between 1992 and 2012. A nested-case control design was applied to randomly

select 7500 gender- and age-matched living controls from the bereaved cohort. Suicide risk associated with the different risk factors was assessed using conditional logistic regression.
Results: Bereaved offspring with low social support, indicated by offspring's status as single and repeated changes in marital status and residence, had a significantly increased suicide risk compared to bereaved offspring with high social support. Moreover, low income and education only increased suicide risk in people who are single, again signifying the importance of social support. Having an immigration background, having lost both parents and loss due to suicide also constituted risk factors for suicide in parentally bereaved offspring.
Discussion: Healthcare professionals should be aware of the additional risk posed by the identified risk factors and incorporate this knowledge into existing practice and risk assessment in order to identify individuals at risk and effectively target bereaved family and friends for prevention and intervention programs. Ideal follow-up for bereaved families should include a specific focus on mobilizing social support.

M20. GENDER DIFFERENCES IN CORRELATES OF SUICIDAL IDEATION AMONG PREVIOUSLY DEPLOYED VETERANS: RESULTS: FROM THE SURVEY OF EXPERIENCES OF RETURNING VETERANS

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Background: Elevated suicide rates for Veterans compared to civilians are more pronounced for females than for males and among Veterans, suicide rates are increasing considerably faster for females, with an increase of 62.8% from 2001 to 2014 compared to 29.5% for males. As such, research is needed to identify factors which relate to suicidal thoughts and behaviors among female Veterans and to examine whether gender moderates key suicide risk factors among Veterans. The majority of studies to date, however, have not included sufficient numbers of female Veterans to examine whether risk or protective factors for suicide differ in regard to the magnitude of their association with suicidal thoughts or behaviors when compared to male Veterans. Such information could help guide gender-sensitive suicide risk assessment and provide insight regarding whether suicide prevention efforts should target different experiences for male and female Veterans. Accordingly, the present analysis leverages information captured in the Survey of Experiences of Returning Veterans (SERV), a longitudinal OIF/OEF Veteran cohort study, to address this critical research gap.
Methods: SERV aims to examine gender differences in risk and protective factors for addictive behaviors and co-occurring conditions. Suicide Ideation (SI) in the past three months and lifetime suicide attempt (SA) were assessed with the Columbia Suicide Severity Rating Scale. Additional measures of interest for the present analysis included: demographics, military experiences, physical and mental health screens, current life concerns, and perceived meaning in life. This analysis summarizes respondents' active SI and lifetime SA history and presents findings from logistic regression models which assess gender differences in the correlates of active SI at baseline.
Results: Of 812 participants with complete data, 340 (42%) were female, 122 (15.0%) reported a history of SA, and 123 (11.7%) reported active SI. Prevalence of SI did not vary significantly by gender, even after accounting for demographics, combat exposure, and

mental health conditions. In evaluating gender-specific risk profiles for SI, we found that being a Veteran with a history of SA, who has had significant combat exposure, who is currently abusing alcohol or who is lacking a secure home or experiencing financial problems was more strongly associated with SI for women than men. In contrast, we found that being a Veteran who is experiencing higher levels of PTSD symptoms, who has concerns about recent traumatic events (e.g. divorce, health crisis), or who reports less meaning in life is more strongly associated with SI for men. Other suicide risk factors (i.e., depression, anxiety, TBI, drug abuse, insomnia) were similarly associated with SI for men and women.
Discussion: Active SI was relatively common in this sample. Although the prevalence of SI did not vary by gender, clear gender differences in correlates of SI were observed which could help to inform gender-sensitive Veteran suicide prevention efforts. For example, our findings suggest that although quality mental health treatment is likely to be important for both male and female Veterans in preventing and addressing suicidal thoughts and behaviors, female Veterans may benefit more from interventions which help them address current life challenges such as alcohol abuse and housing or financial concerns. Male Veterans may need more support managing their PTSD symptoms while also addressing recent traumatic events in their life. SERV offers a unique opportunity to improve our understanding of factors which may help to explain gender differences in suicide risk among recently returning Veterans who served in the recent conflicts.

M21. PREDOMINANCE AND PROXIMITY OF MENTAL HEALTH CARE CONTACT TYPES PRIOR TO SUICIDE IN PEOPLE WITH IDENTIFIED BIPOLAR DISORDER OR SCHIZOPHRENIA

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Background: The current study characterizes and compares health care contacts before suicide death between those with bipolar disorder (BD), schizophrenia, and a control cohort.
Methods: Data were linked between the Office of the Chief Coroner of Ontario for suicide deaths in the city of Toronto from 1998-2011 (n=2835) and provincial health administrative data. Frequency, timing, and correlates of health care contacts in the year prior to suicide death were examined between decedents with BD (n = 176), schizophrenia (n = 195), and a non-BD non-schizophrenia control group (n = 2464).
Results: More than 90% of suicide decedents with BD or schizophrenia had some form of mental health care contact during the year prior to death, significantly higher than the control group. For both the BD and schizophrenia groups, ambulatory care contacts were more likely than acute care contacts, and outpatient psychiatrist visits were the most frequent type of contact. The median time from last contact to time of death was shorter for outpatient psychiatric contacts relative to outpatient primary care or emergency department contacts.
Discussion: Suicide decedents with major mental illnesses such as BD or schizophrenia are very likely to have received mental health care during the year prior to death, most commonly and most proximally in an ambulatory care setting. This finding has important implications for the development and implementation of suicide prevention measures by reinforcing the

centrality of ambulatory mental health care contacts as windows of opportunity for suicide prevention, even for patients with major mental illness.

M22. THE INTERGENERATIONAL TRANSMISSION OF SUICIDAL BEHAVIOR: A CHILDREN OF SIBLINGS AND TWINS STUDY

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Background: Previous research has documented that parental suicidal behavior is associated with offspring suicidal behavior (Agerbo et al., 2002). In order to test whether the association is consistent with a causal interpretation, most studies have statistically controlled for measured covariates (e.g., parental psychiatric disorders) to examine whether parental suicide is independently associated with offspring suicide when comparing unrelated individuals (e.g., Brent et al., 1996). Yet, numerous reviews have highlighted the fact that these studies are unable to rigorously test plausible alternative explanations, which is a major limitation of research thus far (Nock et al., 2008). Given that twin and extended family studies suggest that genetic factors partly account for the variability in suicidal behavior in the population (Tidemalm et al., 2011), studies that do not account for unmeasured genetic covariates cannot be used to draw causal inferences about the intergenerational transmission of suicide. In order to rigorously test the association between parental and offspring suicidal behavior, we utilized Children of Siblings and Children of Twins (CoS/CoT) designs to examine differentially exposed cousins with varying degrees of genetic relatedness.

Methods: We merged eight longitudinal, population-based Swedish registers to generate a nationally representative sample of offspring born 1973-2001 (N=2,891,267). We linked all cohort members to their parents and determined parent-sibling relationships using the Multi-Generation Register. We obtained information about offspring and parental suicidal behavior (defined as either suicide attempt or death by suicide) from the National Patient Register and Cause of Death Register using International Classification of Disease-8/9/10 codes. We restricted all offspring suicidal behavior to before age 18 based on previous research (Wilcox et al., 2010). We fit Cox proportional hazard regression models to examine the risk for offspring suicidal behavior after parental suicidal behavior among children of siblings and twins. In addition to controlling for a variety of measured covariates (i.e., offspring sex and parity, and parental age at childbearing, educational attainment, country of origin, severe mental illness, criminality), using the CoS/CoT designs accounts for unmeasured genetic and environmental factors shared by cousins.

Results: In the general population, preliminary results suggest that parents with suicidal behavior were more likely to have offspring with suicidal behavior (Hazard Ratio (HR)=2.60 [2.51-2.69]). When controlling for measured covariates, the risk was attenuated (HR=1.57 [1.51-1.62]). In the cousin-comparison models, the risk did not attenuate further when analyzing children of maternal half-siblings (HR=1.49 [1.23-1.79]), maternal full-siblings (HR=1.31 [1.21-1.41]), and DZ and MZ twins (HR=2.07 [1.19-3.62]).

Discussion: Offspring of suicidal parents are at an increased risk to attempt or die by suicide. Measured and unmeasured covariates partially confounded the relation between parental suicidal behavior and offspring suicidal behavior. However, the associations from children of siblings and twins analyses did not attenuate when controlling for more genetic and shared environmental factors. Thus, we conclude that the association between parental and offspring suicidal behavior is consistent with a causal interpretation. Future studies should use

quantitative behavior genetic methods to address how the intergenerational transmission of suicidal behavior is transmitted across generations, as well as explore potential effect moderation by parental sex.

M23. ROLE OF PHARMACOGENETIC TESTING IN SUICIDAL IDEATION DURING ANTIDEPRESSANT TREATMENT

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Background: Pharmacogenetic-guided treatment is being increasingly considered for improving psychiatric drug treatment. The effect of pharmacogenetic guidance on suicidal ideation has not been investigated.

Methods: To test the feasibility and utility of pharmacogenetic testing, we conducted a multi-year study and provided pharmacogenetics-based guidance to clinicians in prescribing antidepressant and antipsychotic medications. This study, IMPACT, was cross-diagnostic and naturalistic, and included patients referred by primary-care physicians, allied health professionals, and psychiatrists. The IMPACT study uses a combinatorial pharmacogenomics test GeneSight (Assurex Health), which tests for variants in six liver enzyme genes (CYP1A2, CYP2D6, CYP3A4, CYP2C9, CYP2C19, CYP2B6) and two serotonin genes (HTR2A, SLC6A4). The patients are assessed for symptom severity and side effects at baseline and eight weeks.

As part of an interim analysis for the IMPACT study, we selected participants with Beck Depression Inventory (BDI) scores of at least 20 at baseline, and medication information available for their baseline (V0) and eight-week follow-up (V2) visits. We divided the patients into two groups: patients whose physicians considered the genetic information that was provided in prescribing were classified as 'congruent' group compared to patients whose medications were not guided by the GeneSight report ('non-congruent'). In this pilot analysis, we included only patients of self-reported European ancestry. A total of 253 participants were available for analysis. Of these, 83 reported SI at baseline. Among these SI patients, 33 patients received congruent medications and 50 were non-congruent. We examined whether receiving congruent medications resolved SI.

Results: Our preliminary analysis did not detect a statistically significant association between medication congruency and the resolution of SI. However, numerically, patients who received congruent medications were more likely to report no SI at follow up (Odds Ratio=1.62; 95% CI: 0.66-3.98, p=0.29).

Discussion: This exploratory analysis did not show a major effect of pharmacogenetic testing on suicidal ideation. However, our analysis is limited by the small sample size and the naturalistic design of the study. Larger prospective randomized controlled studies will identify the contribution of pharmacogenetic testing in SI.

M24. THE LIPID - SUICIDE STORY: UPDATES

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Background: Suicide and suicidal behaviors have been classified as among the leading causes of death and injuries worldwide. Rates of suicide and suicidal behaviors vary within and between countries, with variability that has been attributed to population and individual risk factors. Factor domains include economic status and cultural differences, which can manifest through diet.
Methods: We focus on the scientific literature concerning two major dietary lipid classes and their implication in suicide risk, cholesterol and polyunsaturated fatty acids (PUFA).
Results: Meta-analyses find lower serum total cholesterol associated with higher risk of suicidality, suicide attempts, and suicide; and three studies have linked low omega-3 PUFAs with suicidal behaviors. A number of studies examine intermediates relating to potential mechanisms of action, including Toll-like receptors (TLRs), nuclear factor κB (NFκB), peroxisome proliferator activated receptors (PPARs), and interleukin-6 (IL-6).
Discussion: We describe a theoretical model linking cholesterol and PUFAs to suicide risk. This model takes into account the effects of cholesterol-lowering interventions on PUFA balance; membrane lipid microdomains as a nexus of interaction between cholesterol and omega-3 PUFAs; and downstream effects on specific inflammatory pathways.

M25. HISTOPATHOLOGICAL FINDINGS IN BRAIN OF VARIOUS CASES OF SUICIDAL DEATHS

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Background: Suicide is a foremost cause of morbidity and mortality in all age groups worldwide. According to WHO 2013, nearly one million people die from suicide every year. According to national crime record bureau over 1,33,623 people died by suicide in 2015 in India. Every passed hour 15 people ended his/her life. Nowadays it is a major public health problem which consists medical as well as social problem. Alcohol and drug abuse are considered as the important risk factors for completed suicide. Many studies have been conducted in different parts of the world to find the association between suicidal tendencies and alcohol/drug abuse.
Methods: In this recent study different brain sections: Cerebrum, Cerebellum, Brain stem, Hypothalamus, Thalamus, Hippocampus of 34 cases of suicide were analyzed using H&E stain. Main objective of this study was to find out neurobiological effect of alcohol and different drugs in suicidal deaths by histopathology.
Results: Out of 34 cases no abnormality was found in 14 cases, Edema in white matter were found in 8 cases, periventricular edema were found in 5 cases, cortical dysplasia were found in 2 cases, swiss cheese appearance were found in 2 cases, autolyzed artifact was found only in 1 case, in 2 cases corpora amylacea were found. Out of these 19 positive histopathology cases, 8 cases were positive for alcohol. Drug were positive in 3 cases but they were negative for any histopathology finding.
Discussion: This study concludes that many suicide decedents were intoxicated by alcohol at the time of death. Alcohol and various drugs are known to reduce inhibitions and increase risk-taking, impulsiveness with an increase in suicide ideation. Having such knowledge provides a better understanding of the circumstances surrounding the decedent's death, their possible state of impairment, including the possibility of a staged suicide.

M26. BOWEL INTEGRITY IN MAJOR DEPRESSION AND SUICIDALITY

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Background: Depression and suicidality have been suggested to be linked to inflammation. We have previously shown increased plasma levels of soluble Urokinase-Type Plasminogen Receptor (suPAR) in patients suffering from major depressive disorder (MDD) and suicidal attempters, indicating the presence of low-grade inflammation in conjunction both to MDD and suicide. Leaking gut has been shown to cause inflammation in the brain and development of depression. Zonulin as well as the intestinal fatty acid binding protein (I-FABP) has been identified as biomarkers for gut permeability.
It has been shown that the concentration of both zonulin and I-FABP, were changed in early-dying HIV-patient. A decrease of zonulin was accompanied by an increase in I-FABP levels, indicating the translocation of microbial species in AIDS-patients.

The aim of this study was to investigate the plasma levels of zonulin and I-FABP in samples from MDD patients and suicide attempters.

Methods: The levels of zonulin and I-FABP in cryo-preserved plasma samples were measured using enzyme based immunological methods according to the manufacturer´s instructions. Statistical analysis of the results was performed using Mann-Whitney´s U-test and Pearsons correlation's
Results: The levels of zonulin showed, although not statistically significant, a tendency to be increased in MDD-patients compared to healthy controls. However, the zonulin concentration was significantly decreased in samples from suicidal patients compared to both MDD and controls. The concentration of I-FABP was significantly higher in samples from suicidal patients than in both MDD- and control samples. The only significant correlation observed was between zonulin and suPAR in MDD-samples.
Discussion: An increase in gut permeability, should normally be indicated by an increase in zonulin levels. This was noticed in MDD samples. In samples from suicidal attempters, low levels of zonulin was seen together with increased I-FBAP. The present results are contradictory with respect to zonulin and could be explained as a result of medication. However, this remains to be further investigated.

M27. Poster Withdrawn

M28. SENSITIVITY OF ASSESSMENT FOR SUICIDAL IDEATION TO DETECT LATER COMPLETED SUICIDE IN MENTAL HEALTH SERVICES

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Background: Screening for suicidal ideation is a key component of clinical suicide prevention. Clinicians rely on screening via clinical interview to detect suicidal ideation and tailor interventions accordingly. Clinical screening often reports suicidal ideation as a dichotomous variable, although scales of suicidal ideation and behaviour may be used in research. This approach to screening for suicidal ideation assumes this method is an adequate in detecting outcomes of interest.

Although the limitations of clinical or research models to predict suicidal behaviour has previously been established it has not been clear how sensitive or specific clinical screening for suicidal ideation is for detecting those individuals who will later complete suicide.

Methods: Medline and Pubmed were searched with MeSH term 'suicid*'. 21901 titles were searched. Included studies were those that 1) sampled patient populations, including inpatient, emergency department and outpatient settings, reported 2) suicidal ideation and 3) completed suicide, and included the frequency of both, 4) had living control groups, and 5) were either cohort or case –control study design. Studies not reported in English, and those using the psychological autopsy method were excluded. 515 abstracts were searched and 350 full text articles were reviewed. 61 articles met inclusion criteria. Data was extracted by authors and entered into MetaDisc software, which was used to construct a receiver-operating curve and report sensitivity and specificity.

Results: Preliminary results suggest that the sensitivity of suicide ideation for completed suicide is about 40% while the specificity of non-suicide ideation for non-suicide is about 90%.

Discussion: Responses to screening questions for suicidal ideation in clinical settings should only be considered useful if positive for suicidal ideation. The low sensitivity of suicidal ideation for completed suicide suggests approximately 60% of cases will be missed.

All mental health populations should receive evidence based suicide prevention interventions, whether means restriction, safety planning, systematised follow up and psychological therapies targeting suicidal ideation and behaviours. Future research should examine the sensitivity of suicidal ideation and behaviour scales for completed suicide. Measurement of suicidal ideation proximal to suicidal events (suicide attempts and completed suicide) warrants investigation for sensitivity and specificity.

M29. EXPERIENCES WITH SUICIDAL BEHAVIORS AND THEIR RELATIONSHIPS TO PERCEPTIONS OF PRECIPITANTS AND PROTECTANTS OF LATE-LIFE SUICIDE

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Background: The meanings and consequences of suicidal behaviors are defined, in part, by personal and cultural beliefs as well as one's life experiences. Individuals who have attempted to take their own lives have a proximal experience with suicide, whereas individuals who experienced the suicide death of a close friend or family member have a distal experience with suicide. Although previous suicide attempts and having a relative or friend who has completed suicide are considered to be important risk factors, the attitudes of individuals with proximal experience of suicide may differ from individuals with distal experience of suicide, as well as from those who have no experience with suicide. The present study explored the impact of individuals' differing experiences with suicide on their attitudes about aging and late-life suicide in a cross-sectional vignette study.

Methods: A sample of 642 adults (M age = 27.73 years, SD = 16.60 years, range = 18 to 81 years; 74.8% women; 72.5% White/European-American) read a fictional obituary of an older adult who completed suicide. Participants then answered questions regarding their perceptions of 10 stressful precipitating events and eight protective factors as well as measures on age stereotype, age distancing, suicidality, and reasons for living. Participants were categorized by whether they indicated proximal, or distal experience with suicide.

Participants who indicated having both proximal and distal experiences were included in the proximal group. A series of t-tests were conducted to examine the difference in mean scores across groups or individuals with different suicide experiences.
Results: Results indicated that individuals with proximal experiences with suicide reported greater overall agreement with suicide t(292)= 3.43, p=.001; more agreement with negative attitudes toward aging t(292)= 2.73, p=.007, and more engagement in age distancing t(292)= 2.10, p=.034 than individuals who reported having only distal experience of suicide. Moreover, individuals with proximal experience with suicide scored higher on a measure of suicidal ideation t(154.95)= 7.53, p=.000, and scored lower on a measure of reasons for living t(156.69)= -4.07, p=.000, compared to those in the distal group. Regarding precipitants, when compared with the distal group, individuals in the proximal group agreed more with the decision to suicide for 9 of the 10 stressors: social isolation, t(292)= 3.64, p=.000, death of a first degree relative t(292)= 3.45, p=.001, illness of a first degree relative t(292)= 3.25, p=.001, feeling like a burden, t(292)= 2.83, p=.005, severe terminal illness t(292)= 2.43, p=.016, family discord t(164.88)= 2.77, p=.006, separation or divorce t(188.41)= 2.46, p=.015, employment change/retirement t(181.27)= 2.36, p=.020, and legal difficulties t(177.30)= 2.14, p=.034.
Discussion: Our results suggest that the cultural framework of suicide may be unique to those who have proximal experience with suicide and differs from those who have distal experience with suicide. In addition, individuals with distal experience of suicide may have more in common with individuals with no experience of suicide suggesting that losing a close friend or relative to suicide may be less of a risk factor than having a personal history of suicidal behavior. Lastly, exploring individuals negative attitudes toward aging may help to reduce suicidality in late-life. Additional analyses will explore group differences on perceptions of individual precipitants and protectants.

M30. DEVELOPING AN EXPERIMENTAL PROCEDURE TO ELICIT SUICIDAL REACTIVITY

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Background: Imagine you were having intense chest pains while exercising. What would you think if you went to see the cardiologist and the exam consisted of asking you about how you think your heart would respond to stress rather than actually examining your heart's response to external stress in a controlled environment (i.e., a cardiac stress test)? The vast majority of suicide risk assessment is based on the analogous question, "How do you think you will cope if you experience an emotional stressor?" Predicting suicidal behavior is phenomenally challenging, partially because mental health clinicians are forced to rely primarily on patient self-report when assessing suicide risk in the relative calm of a mental health clinic or psychiatric inpatient unit. Over the past 50 years, the field of suicidology has made little to no progress improving clinicians' capacity to predict suicide. In this paper presentation we propose that this lack of progress is partially due to an absence of paradigms to objectively assess how patients will react and cope with suicide-related stress in the real world. Further, we will present findings from a pilot study evaluating a suicide-specific mood induction, which combines video and audio stimuli with the aim of briefly activating "dormant" suicide risk, followed by a positive mood repair induction.

Methods: Eighteen veterans with current or past mood, anxiety, and/or trauma related disorders participated in the study. Ten participants had attempted suicide within the past year; whereas, the remaining eight participants had never seriously considered suicide. All participants took part in the mood inductions and rated their current affect before and after each induction using the Self-Assessment Manikin (SAM), a non-verbal pictorial assessment technique measuring emotional valence (pleasant vs. unpleasant), arousal (calm vs. aroused), and dominance (controlled vs. in control) using three sets of five images varying in intensity; scores rage from 1 to 9, with higher numbers representing a more negative valence, arousal, and dominance. Participants who had attempted suicide were also asked to complete the SAM based on how they felt during their worst suicidal crisis.
Results: All participants reported that the suicide-specific mood induction resulted in moods that were similar- but slightly less intense- than those experienced during suicidal crises (e.g., SAM valence post-induction M=8.2, SD=1.0; SAM valence during suicidal crisis M=8.6, SD=1.2). Responses to the induction were similar regardless of participants' history of suicide. Data also provided preliminary support for the efficacy of the mood repair induction, with all participants reporting improvements in emotional valence. Furthermore, no participants endorsed increases in desire for self-harm or suicide when assessed at the start of the study visit and re-assessed at the conclusion of the study visit using the University of Washington Risk Assessment Protocol. No adverse events were reported.
Discussion: We discuss these preliminary findings as a first step in developing a procedure to safely and ethically assess the ease with which suicide-relevant physiological, emotional, or cognitive processes are activated by suicide-relevant cues. Additionally, we describe potential directions for future research incorporating similar experimental inductions to overcome the limitations of self-report assessment and better understand and predict suicidal behavior.

M31. THEORY OF MIND AND NONSUICIDAL SELF-INJURY IN ADOLESCENT INPATIENTS

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Background: Nonsuicidal self-injury is prevalent and problematic in adolescents, representing a major public health concern. Previously, NSSI has been related to interpersonal functioning, with well-documented links between social processes and self-injurious behavior (Muehlenkamp, Brausch, Quigley, & Whitlock, 2013; Nock & Mendes, 2008; Prinstein et al., 2010). One domain of interpersonal functioning linked to NSSI is social cognition. Theory of mind (ToM), which refers to one's ability to attribute mental states to the self and others (Sharp et al., 2011), has been implicated as a social-cognitive construct related to NSSI, with treatment-based research finding that interventions focused on ToM (i.e., Mentalization-Based Treatment) reduce adolescent self harm behavior (Rossouw & Fonagy, 2012). Despite intervention-based research, empirical work has yet to directly investigate the relation between ToM and NSSI in adolescent inpatients, a subset where NSSI remains prevalent and medically severe. Against this background, the present study aimed to examine the relation between ToM and NSSI in a high-risk adolescent inpatient sample. Specific aims of the present study were: (a) to examine the relation between ToM impairment and behavioral characteristics of NSSI (lifetime frequency, medical severity), and (b) to examine the relation between ToM impairment and NSSI functions.

Methods: N=63 adolescent inpatient self-injurers admitted to a private, residential inpatient unit were recruited for the current sample. ToM was assessed using a computerized experimental task, the Movie Assessment of Social Cognition, and NSSI was assessed with semi-structured interviews and self-report based measures. First, correlational analyses were used to examine the relation between ToM, NSSI behavioral characteristics (frequency, severity), and covariates (depressive symptoms, age, gender, race). Second, we examined bivariate and regression analyses between ToM impairment, NSSI functions (13 individual function subscales loading onto two sub-domains: intrapersonal, interpersonal), and all aforementioned covariates.
Results: No significant relations were found between ToM impairment and behavioral characteristics for NSSI, per correlational analyses. Bivariate and regression analyses indicated ToM impairment was significantly related to overall endorsement of interpersonal functions for NSSI, particularly toughness and autonomy, and this was unique from ToM impairment's null relation to intrapersonal functions for NSSI. Regression analyses revealed the ToM-interpersonal NSSI function relation exists above and beyond the effects of depression, and is not moderated by gender.
Discussion: Findings overall suggest that, although intrapersonal functions for NSSI are most commonly endorsed among adolescent inpatients, impairments in an adolescent's ability to attribute, interpret, and understand the mental states and emotions of others uniquely relate to interpersonally-focused functions for NSSI. Findings on the ToM-NSSI functionality relation point to the efficacy and importance of utilizing emotion-focused (i.e., Dialectical Behavior Therapy) and social-cognitive treatments (i.e., Mentalization Based Treatment) for adolescent self-injurers in acute care settings.

M32. UNDERSTANDING THE CONNECTION BETWEEN PARENTING AND SUICIDAL IDEATION AMONG ADULTS: THE MEDIATING ROLE OF ATTACHMENT

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Background: It has been argued that aspects of parenting may be associated with children's vulnerability for suicidal thoughts and behaviour in adulthood. Although the connection between these variables is complex, an important issue to understand is how parenting, attachment and suicidal ideation are related. Attachment is characterised as a psychobiological function that regulates emotional bonds. It is activated in childhood, it has been shown to be affected by experience of parenting and these early experiences generalise to other relationships later in life. There are different types of attachment relationships, with secure (comfortable with intimacy and autonomy) and insecure attachments commonly reported. Insecure attachment is also operationalized in different ways; it may be defined as preoccupied (preoccupied with relationships), dismissive avoidant (dismissive of intimacy and counter-dependent), and fearful avoidant (fearful of intimacy and socially avoidant). Although findings from a recent systematic review suggest that insecure attachment is associated with suicidal ideation and behaviour, the mechanisms that account for this relationship remain unclear. The primary aim of this study is to address this dearth in research and test the specific hypothesis that neglectful and overprotective parenting predicts suicidal ideation and that this relationship is mediated by adult attachment styles.
Methods: We recruited 730 adults from the general population (mean age= 25.08 years, SD = 8.40) who completed an online battery of self-report questionnaires about their experiences

of parenting, their current attachment styles, and current suicidal ideation. Preliminary correlation analyses between parenting, attachment and suicidal ideation indicated the existence of a relationship between these variables in the direction previously suggested by the literature. A series of multi-mediation analyses were conducted to investigate (i) the extent to which parenting is a predictor of suicidal ideation, (ii) and whether this relationship is mediated by attachment styles (when considered simultaneously). After the primary analyses, all of the significant models were adjusted for depression.
Results: When the four attachment styles were entered as simultaneous mediators, only fearful avoidant attachment remained as a significant mediator between parenting and suicidal ideation, after adjusting for depression. This relationship was significant for all participants and for female participants but not significant for male participants.
Discussion: Although the literature suggests that insecure attachment styles are associated with suicidal ideation, the findings from the present study suggest that fearful attachment is the strongest mediator of the relationship between parenting and suicidal ideation. In psychological terms, this could mean that the relationship with parents characterised by significant low levels of care or an excess of protection and control over the child could lead to a maladjusted perception of the self (sense of unworthiness) which is, in turn, associated with suicidal ideation. As suicidal thoughts and behaviours are a result of a complex net of variables, we acknowledge that the present analyses should be seen as partial explanation of the development of the vulnerability for suicidal behaviour. The results of the present study provide novel insights into the development of vulnerability for suicidal behaviour as well as into the complex dynamics between parenting, attachment styles and suicidal ideation.

M33. STRESSFUL SITUATIONS: HOW STRESS REACTIVITY MODERATES THE RELATIONSHIP BETWEEN MORAL INJURY AND PTSD

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Background: Despite efforts of researchers and military officers to raise awareness, suicide rates among the armed forces has continued to increase (National Center for Telehealth and Technology, Defense Centers for Psychological Health, 2014). Research suggests focusing on deployment related experiences rather than number of deployments (Bryan, 2015). Post-traumatic stress disorder (PTSD) can result from disturbing experiences during deployment and is characterized by distress reactions to re-experiencing traumatic events through persistent and disturbing thoughts (Howlett & Stein, 2016). PTSD is prevalent in the military with 10-18% of combat troops experiencing symptoms and approximately 30% of veterans experiencing PTSD at some point in their lives (Litz & Schlenger, 2009; King, King, Fairbank, Keane, & Adams, 1998). Previous research has linked PTSD with lifetime suicide attempts (Nepon, Belik, Bolton, & Sareen, 2010), suicidal behavior (Sareen et al., 2007), and suicidal ideation (Sareen, Houlahan, Cox & Asmundson, 2005).
One way military personnel deployed could develop PTSD is through moral injury. Moral injury is, "perpetrating, failing to prevent, or bearing witness to acts that transgress deeply held moral beliefs and expectations" (Litz et al., 2009, p. 697). Moral injury has been separated into three categories; Self-Transgressions (ST; deeds done by the individual that goes against their personal or moral beliefs), Others-Transgressions (OT; seeing or learning about things done by others that infringe on personal or moral beliefs), and Betrayal (the perception that the individual has been betrayed by others while deployed; Bryan et al., 2014; Nash et al., 2013). Previous research on moral injury has shown relationships with self-

injurious thoughts and behaviors as well as suicidal ideation in a clinical sample of military personnel (Bryan, Bryan, Morrow, Etienne, & Ray-Sannerud, 2014). Despite this, no studies have examined the effects that moral injury has on PTSD.

Methods: This study examines if the relationships between the moral injury subscales and PTSD is affected by individual's perceived stress reactivity (PSR). The Perceived Stress Reactivity Scale (Schlotz et al., 2011) measures individual's exposure to stress and their response everyday situations. Individuals' PSR contributes to traumatic re-experiencing of deployment events, especially among those who violated their morals.

Results: Participants were previously deployed U.S. military personnel recruited from a Joint Forces Training Center in the southern U.S. (n= 286; 82.6% male; 66.8% white; mage = 28.7). Results indicated that the interaction of ST and PSR significantly predicted PTSD symptoms ($t = -2.05$; $p = .041$; $f2 = .047$). Simple slopes revealed that PSR was significantly associated with PTSD symptoms at high ($t = -3.39$; $p = .001$) and mean ($t = -2.99$; $p = .003$), but not low ($t = -1.28$; $p = .203$) levels of PSR. Next, betrayal and PSR significantly predicted PTSD symptoms ($t = -2.31$; $p = .021$; $f2 = .134$). Simple slopes revealed that PSR was significantly associated with PTSD symptoms at high ($t = -5.65$; $p < .001$), mean ($t = -5.78$; $p < .001$), and low ($t = -3.16$; $p = .002$) levels of PSR. Finally, OT yielded non-significant results ($t = -.98$; $p = .32$).

Discussion: Results suggest that those with high and mean levels of PSR who acted against their morals during combat have higher levels of PTSD. Those who were betrayed have increased level of PTSD at all levels of PSR. This indicates that betrayal influences PTSD and PSR may compound at any level. This study can enhance suicide prevention techniques in military personnel with moral injury by identifying how deployment experiences can affect mental health and potential suicide risk.

M34. SUICIDE INOCULATION? EXAMINING THE EFFECTS OF EXPOSURE TO SUICIDE BEYOND CONTAGION

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Background: The suicide contagion effect has been well documented in various contexts, especially among adolescents. However, some studies and anecdotal evidence point to the opposite effect as they indicate that exposure to suicide can, in some individuals, also decrease one's risk of suicide. In this study, we consider data from interviews with bereaved families and friends of individuals who have died by suicide to examine ways in which the exposure to suicide might produce this 'suicide inoculation' effect.

Methods: Data comes from 55 interviews with the bereaved survivors of suicide conducted in a few urban and suburban locations across the United States. The interviews ranged from 1.5-2.5 hours, and were then transcribed and coded for relevant themes in NVivo. The respondents were classified in three groups 'evidence of contagion,' 'evidence of inoculation,' and 'other/inconclusive,' and the 'inoculation' group was analyzed more closely. The data has been anonymized, including the use of pseudonyms. This research received human subjects approval from the University of Chicago's Institutional Review Board.

Results: Among the 55 interviews, we designated 12 respondents as 'evidence of inoculation'. These individuals voiced clear changes in attitudes about suicide following the suicide death of their friend or family member, indicating their perception of a decreased suicide risk. In their responses, these individuals reveal a great awareness of their own, as

well as others', grief and point out that they could never cause their own loved ones such grief by taking their own lives. While many of these individuals would have been considered low risk prior to their exposure to the suicide death (e.g. no mention of mental health issues, economically and social stable lives etc.) we found the inoculation effect among individuals with histories of mental health issues, self-injury and suicide attempts as well.

Discussion: Current research on suicide contagion stipulate two pathways through which exposure to suicide can increase one's risk of suicide—by impacting the bereaved's mental health (e.g. increasing likelihood of depression, itself a suicide risk factor) and/or by making suicide more available as an option (e.g. through identification with the suicide motive). This study illustrates an alternative pathway, through which exposure to suicide might work to decrease one's suicide risk. Specifically, through exposure to the grief following a suicide death (both one's own and others' grief), individuals are increasingly able to visualize the consequences their own suicide would have on their own loved ones. Thinking about loved ones has been indicated as a protective factor against suicide, and it is possible that exposure to suicide grief strengthens it, thereby decreasing overall risk of suicide. By exploring this pathway, this study adds to the suicide contagion literature and makes recommendations for future studies of effects of exposure to suicide. Furthermore, this study also has implications for suicide prevention, urging a closer look at programs that bring together suicidal individuals and bereaved families.

M35. PAST YEAR NSSI IS A ROBUST PREDICTOR OF PAST YEAR SUICIDE ATTEMPT STATUS

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Background: Studies have established that non-suicidal self-injury (NSSI) is a robust risk factor associated with future suicide attempts (Hamza et al., 2012; Whitlock et al., 2013), often conferring greater risk than commonly known factors such as hopelessness and depression (Klonsky et al., 2013). Cross-sectional group comparison studies have identified NSSI lifetime frequency and number of methods (i.e., versatility) as unique predictors of suicidal behaviors (Victor & Klonsky, 2014). However, a majority of these studies have focused on lifetime NSSI and lifetime suicidality. Few studies have examined the associations between NSSI and suicide attempts within a concise time frame, like the past year. Additionally, there are no known studies examining whether risk for suicidal behaviors conferred by NSSI is mitigated by the presence of protective factors like resilience or life satisfaction. The current study evaluated the hypothesis that resilience and life satisfaction would moderate the association between NSSI frequency, versatility, and suicide attempt status such that high levels of resilience and life satisfaction would reduce the likelihood of a suicide attempt for individuals at median and high NSSI frequencies or versatility.

Methods: Data were collected from 2787 (64.3%F; Mage = 19.03, SD = 1.54yrs) Midwestern university students as part of a larger study screening survey that assessed past year and lifetime NSSI (SITBI items), suicidal behavior (SBQ-R item), perceived personal resilience (CD-RISC), and global life satisfaction (Satisfaction with Life Scale). Participants reporting lifetime NSSI (n = 690) were used in the current analyses.

Results: Of those reporting lifetime NSSI, 54.3% reported past year NSSI, with an average of 3.0 SD = 1.69 different methods, and 9.6% (n = 65) reported having attempted suicide once or more in the past year. A binary logistic regression with age and gender as covariates was run to examine the association between study variables. The full model was significant,

X2 (6) = 28.36, p < .01, and correctly classified 87.5% of the participants. Past year NSSI frequency (b = .29, OR = 1.33), versatility (b = .24, OR = 1.27), and life satisfaction (b = -.53, OR = 0.59) were significant predictors, but resilience was not. To examine the primary study hypothesis, two logistic regression analyses were conducted using PROCESS bootstrapping models (Hayes, 2013). The first model examined the moderating effect of life satisfaction on past year NSSI frequency and past year suicide attempt with versatility, age, and gender as covariates. The interaction was non-significant, but life satisfaction (b = -.25, CI = -.41 to -.08; p < .01) and frequency (b = .28, CI = .02 - .54, p < .01) maintained significant effects. The second model examined the moderating effect of life satisfaction on NSSI versatility and past year suicide attempt, covarying past year frequency, age, and gender. The interaction was non-significant, but method versatility (b = .30, CI = .12 to .47, p < .01) and life satisfaction (b = -.30, CI = -.47 to -.14, p < .01) held significant main effects.
Discussion: Among individuals who engage in NSSI, frequency and method versatility appear to be robust predictors of suicide attempts and this effect does not appear to be impacted by the presence of protective factors such as resilience and life satisfaction. Strengthening resilience and life satisfaction may reduce the likelihood of a suicide attempt and should be the focus of clinical interventions, but they do not appear to reduce the robust effect of NSSI. Consequently, efforts to detect and stop NSSI as early as possible may prove to be most effective in reducing risk for suicide within this high risk population.

M36. CLINICAL AND IMAGING STUDIES OF URIDINE: A RAPID TREATMENT FOR SUICIDAL IDEATION VIA SHARED MECHANISMS WITH KETAMINE AND LITHIUM

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Background: There is a critical unmet need for rapid-acting pharmacologic interventions for suicidal ideation (SI). The U.S. National Institute of Mental Health (NIMH) Advisory Council report, "From Discovery to Cure," emphasized that treatment development should be driven by emerging understanding of psychiatric disorders. This was followed by NIMH's adoption of an Experimental Medicine model for clinical trials, where the goal is for a novel treatment to demonstrate "target engagement." This means the drug or psychosocial intervention is shown to be capable of altering an objectively measurable molecular, circuit or behavioral target, that has been linked to the clinical problem under study. For example, disruption of the glutamatergic system has been implicated in suicidal behavior, by studies focusing on gamma-Aminobutyric acid (GABA), glutamate and glutamine. To measure these in vivo requires proton-1 magnetic resonance spectroscopy (1H-MRS). Accordingly, 1H-MRS has been used show that ketamine administration increases brain levels of both GABA and glutamine. Identification of these putative brain chemistry "targets" was an important advance for suicide research, given that ketamine possesses an anti-suicidal effect, that is thought to be independent of its effect on depression.
Methods: We have conducted a series of clinical trials of a related treatment, uridine. Uridine is related to ketamine by the fact that ketamine's effect depends on activation of the mechanistic target of rapamycin (mTOR) pathway, and two articles in the prestigious journal 'Science' reported that the function of mTOR is to activate de novo pyrimidine synthesis.

This means ketamine is an obligate up-regulator of uridine, because uridine is the circulating pyrimidine in humans. In addition, the literature reflects a surprising commonality in the neural effects and brain mechanisms shared by ketamine, uridine, and another drug with anti-suicidal properties: lithium. These will be reviewed and include effects on GABA-A receptors, brain derived neurotrophic factor, glycogen synthase kinase 3 beta, interleukin 6, cortisol/corticosterone, long-term potentiation and synaptogenesis. However, our human studies incorporate 1H-MRS to measure alterations in GABA and glutamine that occur with uridine administration.

Results: First was a study of bipolar depression treated with open-label uridine (n=24). Measures of serum uridine verified that oral uridine impacts serum levels. Clinically, we observed that in a 6-week study, 97% of the decrease in SI occurred after 1 week of uridine treatment. This was followed by a placebo-controlled study (n=34) of uridine for bipolar depression. At the end of 6 weeks, there was a trend toward a lower proportion of uridine-treated participants endorsing SI vs. placebo-treated (Chi Square 2.89; p=0.08). The imaging results showed that in anterior cingulate cortex (ACC), the uridine group had a higher mean GABA/(Glutamine + Glutamate) concentration compared with placebo (p=0.01). Furthermore, the change in ACC Glutamine/Glutamate Ratio (Gln/Glu) showed a strong trend favoring the uridine group (0.06).

Discussion: The potential implications of our uridine clinical results to date will be considered. In closing, our plans to next enroll and study uridine as a rapid treatment for SI in a high-risk population, military Veterans with suicidal thoughts and behaviors, will be discussed.

M37. D-CYCLOSERINE (DCS), AN EMERGING, ORALLY ACTIVE TREATMENT FOR DEPRESSION AND SUICIDALITY?

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Background: The ability of N-methyl-D-aspartate receptor (NMDAR) antagonists such as ketamine to induce rapid reductions in both depression and suicidality has now been extensively documented. Clinical use of ketamine-like compounds, however, is limited by their marked psychotomimetic effects, relatively short duration of action and potential for neurotoxicity during repeated treatment. This presentation focuses on the potential clinical utility of D-cycloserine (DCS), an orally active NMDAR antagonist, for long-term maintenance of anti-suicidal effects following acute ketamine treatment.

Methods: DCS is an anti-tuberculosis medication that fortuitously modulates NMDAR function. Anti-depressant effects of DCS were first reported in the late 1950's but were only recently reconfirmed. As opposed to ketamine, DCS is orally active, and so can be administered as a standard daily treatment. Moreover, DCS binds to the glycine modulatory site of the NMDAR (partial allosteric modulation), which confers a reduced liability for inducing psychotomimetic side effects relative to "channel blockers" such as ketamine. This liability is further reduced by co-administering DCS along with anti-depressants approved for treatment of either unipolar or bipolar depression. In a recent small-scale clinical trial, DCS significantly reduced treatment refractory depressive and anxiety symptoms in major unipolar depression, while prolonging anti-depressant, anti-anxiety, and anti-suicidal effects of ketamine for up to 6 weeks. As with other effective treatments for suicidality, including ECT, effects of DCS are associated with alterations in glutamate levels in key brain regions such as anterior cingulate cortex.

Results: In parallel with clinical studies, animal studies have been conducted to evaluate mechanisms of potential anti-suicidal effects of DCS. In animals, DCS significantly reduces immobility time in the forced swim test, consistent with anti-depressant effectiveness. In addition, it significantly reduces anxiety in the rodent elevated plus maze, and reverses akathisia-like activity induced by standard anti-depressant agents. Effects of DCS on anxiety- and akathisia-like symptoms may be particularly relevant to reported anti-suicidal effects.
Discussion: Although clinical trials with medications such as ketamine or DCS remain at early stage, the availability of such compounds not only provide potential new treatments in the short term, while enabling improved understanding of underlying neural mechanisms in the long term.

M38. INTRAVENOUS KETAMINE FOR ACUTE TREATMENT OF SUICIDAL IDEATION IN INPATIENTS WITH MAJOR DEPRESSIVE DISORDER: FEASIBILITY AND CHALLENGES

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Background: Intravenous ketamine is an effective, albeit temporary, treatment for depression in patients with treatment-resistant major depressive disorder (MDD). An ancillary finding of previous studies is that ketamine can rapidly diminish or even abolish suicidal ideation (SI) in patients receiving it for depression. Given that suicidal ideation is often transient, it may be a particularly well-suited target for a highly effective, acute, intervention like ketamine. However, studies of ketamine with an a priori focus on suicide are largely absent in the research literature. Here we report findings from a pilot double-blind, randomized controlled trial of serial ketamine infusions vs. midazolam, an active placebo, in adult inpatients with MDD who are currently depressed and experiencing SI.
Methods: Participants had DSM-IV diagnoses of MDD as well as SI (as evidenced by a score >0 on either of the Scale for Suicidal Ideation (SSI) or Columbia Suicide Severity Rating Scale (CSSRS) or both, at the screening visit) and were admitted to the inpatient psychiatry unit of a tertiary care hospital. MDD subjects were not required to be treatment-resistant and were given treatment as usual, with the addition of infusions of IV ketamine 0.5 mg/kg or midazolam 0.045 mg/kg ketamine over 40-50 minutes three times per week for two weeks. Five subjects were randomized to receive ketamine (100% were treatment-resistant) and four received midazolam (50% were treatment resistant). Participants were assessed at baseline, pre- and post-infusions, at week 2 (day 14) and 6 (day 42). Clinician- and self-report measures included the CSSRS and the SSI as well as the Montgomery Asberg Depression Rating Scale (MADRS) and a subject satisfaction questionnaire.
Results: All subjects in the midazolam group completed the six treatments while two out of five ketamine subjects dropped out after at least one infusion (one due to hypertension and another decided to pursue ECT instead of continue the trial). The ketamine group had numerically higher MADRS scores at baseline (42.2 +/-5.3 vs. 31.0 +/- 9.0) but had nearly double the reduction of the midazolam group at week 6 (change in MADRS -19.8 +/- 7.2 vs. -10.5 +/- 15.1). Baseline SSI scores were slightly, numerically lower in the ketamine group (14.0 +/- 4.5 vs. 19.75 +/-9.5), however at 6 weeks, the ketamine group had experienced an 84% reduction in SSI scores compared to only a 37% reduction in the midazolam group (2.2

+/- 2.5 vs. 12.5 +/- 15). There was one suicide attempt in the midazolam group and none in the ketamine group.
Discussion: This small pilot study demonstrates the feasibility of augmenting standard antidepressant treatment with serial ketamine infusions to patients admitted to hospital with major depressive disorder and suicidal ideation. Despite the greater levels of depression symptomatology and higher proportion of treatment resistance in ketamine subjects, relative to the midazolam group, these results provide some limited evidence of greater efficacy of ketamine over active placebo in decreasing depressive symptoms and suicidal ideation, and support the need for larger studies to confirm these results.

M39. "TOGETHER" - A UNIQUE PSYCHOLOGICAL APPLICATION FOR CHILDREN AND YOUTH: COULD WE USE THE APP'S EMERGENCY BUTTON TO PROMOTE SUICIDE PREVENTION?

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Background: During our professional work with children and youth, as school psychologists, we have noticed that we need to encompass technology as means of communicating with our clients. The first attempt we made in that direction was to develop a web-site for the public school psychology service. More than 300 questions from children and youth were posted on a forum designed to address emergency situations, during an emergency exercise. Thus we further challenged the use of technology and created an application that incorporate therapeutic principles.
Methods: Joining the application requires parent's consent form. The application consists of three parts: First, the user chooses his avatar characteristics. Second, communication. the user is invited to share information such as current mood, pictures, links, thoughts, comments and specific questions. Third, the user can choose the way he wants to be assisted. He can either read from the professional knowledge in the application (FAQ), ask other users or write a post to a psychologist. In addition there is an emergency button. The application also will alert the managers of the application regarding the usage of the emergency button. Thus, operating this button will lead to a phone call between the user and the psychologist.
Results: The application is now in the phase of Beta version test. we believe that by November an initial data will be available.
Discussion: We would to like to promote the awareness to the importance of being with the children and youth in the technological space and be there as a professional grown up. Moreover, the accessibility and immediacy with which children can use the application, makes it a potential useful tool in prevention of suicide. We believe that there is much to be learned about how children want to consume the help they need on low intensity and crisis situations. The direct access to a psychologist is not a common option.

M40. DETECTING SUICIDE RISK ON PEDIATRIC INPATIENT MEDICAL UNITS: IS DEPRESSION SCREENING ENOUGH?

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Background: Suicide is the second leading cause of death for youth ages 10-24. Medically ill youth are at a heightened risk for suicidal thoughts and behavior. In 2016 the Joint Commission issued a Sentinel Event Alert recommending that all medical patients be screened for suicide risk, but without specific guidance, many hospitals are struggling to implement universal suicide risk screening. Often times, hospitals will screen patients for suicide risk using depression screening instruments. The Patient Health Questionnaire for Adolescents (PHQ-A) is a commonly utilized depression screen that includes an item that is purported to measure suicidal ideation and self-harm (Item #9). However, recent studies suggest that depression screening alone may not be adequate to identify medical patients at risk for suicide. This study aims to determine if depression screening can detect suicide risk in pediatric medical inpatients who screen positive on suicide-specific measures.

Methods: As part of a larger instrument validation study, a convenience sample of medical inpatients, ages 10-21, were recruited from two pediatric hospitals. Participants completed a self-report screening measure for depression (PHQ-A), two validated suicide risk screening tools, the Ask Suicide-Screening Questions (ASQ) and the Suicidal Ideation Questionnaire (SIQ; patients aged 10-14 completed the SIQ-Junior), and a demographics/exploratory variable questionnaire. Patients who scored ≥ 11 on the PHQ-A screened positive for depression and those who responded "Yes" to any of the four ASQ items and/or scored above the SIQ/SIQ-JR cut-off score (SIQ≥41 or SIQ-JR≥31) were positive for suicide risk. Univariate and multivariate statistics were calculated to examine the relationship between screening positive for depression and suicide risk.

Results: A total of 400 pediatric medical inpatients participated as part of the larger study (59% female; 47% white; mean age 15.2 ± 2.9 yrs). Thirty-nine patients (9.8%) screened positive for depression only, 16 (4.0%) screened positive for suicide risk only, and 36 (9.0%) screened positive for both depression and suicide risk. After controlling for demographic factors, patients who screened positive for depression were 13 times more likely to also screen positive for suicide risk (95% CI: 6.8-23.8, p<.001). Of the patients who screened positive for suicide risk, 37.9% (22/58) did not screen positive on the PHQ-A, and nearly half (26/58) did not endorse PHQ-A Item #9. Notably, 16 (27.6%) participants who screened negative for depression and on Item #9 were found to be at risk for suicide based on the suicide-specific measures.

Discussion: In this sample, depression screening alone would have failed to detect over a quarter of youth at risk for suicide. Although there is a clear overlap between depression and suicide risk, some medical patients at risk for suicide may pass through the healthcare system unrecognized if depression screening is used as a proxy for identifying suicide risk. Asking youth direct questions about suicidal thoughts and behaviors using validated suicide risk screening tools may identify more patients in need of further mental health care.

M41. EVALUATING THE EFFECTIVENESS IN INCREASING HELP-SEEKING BEHAVIORS BY EXPOSURE TO AN ADULT MALE PUBLIC SERVICE ANNOUNCEMENT

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Background: Creating and disseminating effective public awareness/messaging on the topic of suicide prevention is complicated, difficult, and costly; moreover, it must be done right to reduce the risk of harm (cf., Klimes-Dougan et al., 2016). As these authors note, many public awareness campaigns lack an empirical base and have not been rigorously studied. The effort in the present study was to ground the public awareness messaging in evidence-based research and to provide data on its impact. SAVE specializes in doing this work, takes the necessary time to define the needs for its campaigns, incorporates lessons from research and meets safety standards in designing its messaging, uses experts and focus groups to test messages/content, etc.
Methods: A 30" PSA was created and disseminated through Facebook advertising depicting an adult male within the age range of the intended targeted viewers engaging in everyday scenes of life while thinking dysfunctional cognitions associated with suicide. A similar flyer was created and disseminated to 5,000 National Guard members during a briefing. This approach is consistent, again, with what is directed by the National Strategy for Suicide Prevention (USDHHS, 2012) that states, "efforts promoting behavior change should convey a clear call to action and provide specific information the audience needs to act."
Results: The PSA was viewed 261,178 times by 105,831 individuals or 14% of the targeted population. Slightly more than 1% of these views and 1.6% of at least one-time viewers resulted in a click to the dedicated web page for an average stay of more than 2 ½ minutes. The flyer produced 30 hits to the dedicated web page from 0.6% of those who received the flyer. This proportion was roughly one-third that of those resulting from the PSA, a significant difference.
Discussion: The primary goal of this study was to determine whether exposure to a short-term suicide prevention PSA campaign would result in help-seeking behavior. In this regard better than 1% of individuals viewing the PSA clicked through to the primary dedicated web page offering corrective cognitions. These results are slightly better than expected given comparable analytics of audience engagement and CTRs. Both these CTRs for the PSA were statistically superior to those achieved via a printed flyer to a similar demographic group. the CTRs to the 2nd dedicated web page exceeded comparable Facebook data with 1.4% of individuals seeking further information about referrals in the metropolitan Minneapolis-St. Paul area. Further, both these CTRs for the PSA were statistically superior to those achieved via a printed flyer to a similar demographic group. It is reasonable to conclude, therefore, that SAVE's suicide prevention PSA was successful in effecting both desired follow-up behaviors, i.e. to seek helpful information and to seek help.

M42. SELF-REPORTED ANXIETY PREDICTS POSITIVE SUICIDE RISK SCREENING IN ADOLESCENTS PRESENTING TO THE EMERGENCY DEPARTMENT

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Background: In 2015, suicide was the second leading cause of death for youth ages 10 – 24. Recent research has established emergency departments (ED) as essential venues for detecting youth at risk for suicide and suicide attempts. Anxiety disorders can be key risk factors of suicidal thoughts and behaviors. Importantly, sub-clinical anxiety symptoms are

also linked to suicide risk in adolescents. While it may be impractical to provide psychiatric assessments for all patients, identifying recent symptoms of anxiety, even by using a single item, may help determine which patients are at elevated risk of suicide and warrant further mental health care. This study aims to assess whether patient-reported symptoms of anxiety are associated with suicide risk in pediatric patients presenting to the ED.
Methods: The sample for this sub-analysis consists of pediatric patients ages 10 to 21 years who presented to one of three pediatric EDs and participated in a multisite study that developed the Ask Suicide-Screening Questions (ASQ) instrument. Seventeen candidate items, including the four ASQ items, and the criterion standard Suicidal Ideation Questionnaire (SIQ), were administered to patients to detect suicide risk. Patients who answered "Yes" to any of the four ASQ items or scored above the SIQ cutoff were considered positive for suicide risk. Self-reported anxiety was assessed using one of the candidate items administered as part of the development of the ASQ ("In the past few weeks, have you felt so nervous or worried in a way that felt unbearable, like you couldn't stand it anymore?").
Results: Participants included 524 patients ages 10 – 21 recruited from three pediatric EDs. The sample was 57% female, 50% white, and had a mean age of 15.2±2.6. 155 participants (30%) endorsed feeling unbearably nervous or worried. After controlling for demographic factors, a multivariate logistic regression revealed that endorsement of the anxiety item significantly predicted screening positive for suicide risk. Participants who endorsed feeling unbearably nervous or worried were five times more likely to screen positive for suicide risk (adjOR= 5.18, 95% CI: 3.06-8.76). All participants who endorsed symptoms of anxiety were more likely to screen positive for suicide risk regardless of chief complaint (adjOR for medical patients=4.87, 95% CI: 2.09-11.36, $p < .001$; adjOR for psychiatric patients=3.95, 95% CI: 1.79-8.72, $p < .001$).
Discussion: Nearly 1/3 of youth presenting to the ED reported having worries that felt unbearable. Notably, youth presenting to the ED reporting recent symptoms of anxiety had a greater likelihood of screening positive for suicide risk, regardless of whether their chief complaint was medical/surgical or psychiatric. Asking brief questions about recent sub-clinical psychiatric symptoms to all pediatric ED patients may allow clinicians to better identify patients at elevated risk for suicide.

M43. LIFESPAN INTEGRATED SUICIDE PREVENTION: HOW CAN DATA BE USED TO DRIVE CHANGE IN MULTILEVEL MODELS OF SUICIDE PREVENTION?

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[1]Black Dog Institute, [2]Coordinare

Background: LifeSpan is a 9 level community-wide, integrated model of suicide prevention currently under trial in Australia. The evaluation focuses on the primary outcome of suicide and suicide attempts, and a range of secondary and process outcomes have been defined. At an implementation level, the challenge is one of service reform, linking the role of data driven improvements intrinsically to the primary and secondary outcomes.
Methods: The LifeSpan model and its evaluation framework were scoped in 2014/15. A randomised stepped wedge design was selected to evaluate the model. With funding secured for commencement in 2016, there has been an extensive process of site selection, planning, and engagement both in terms of the implementation and also feedback required to sites in order to inform delivery, build and maintain engagement, and drive further improvements.

Results: The evaluation framework will be presented, along with the requirements for data defined by the trial sites and the way that these data are being used to engage service providers and sustain improvements.
Discussion: LifeSpan is an implementation trial where local data and implementation requirements require as much attention as the traditional research framework. With increasing interest in implementation science and population-wide suicide prevention frameworks, there is a need to better understand the structures, processes, and data required to build and maintain engagement.

M44. CHARACTERISTICS AND BEHAVIORAL RISK FACTORS OF FIREARM-EXPOSED YOUTH IN AN URBAN EMERGENCY DEPARTMENT

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Background: Understanding firearm access is an important first step in preventing violent injury among adolescents, especially given the contribution of firearm violence to mortality and morbidity in this population. Suicides by firearm are an important public health priority in our young patients. Fifty percent of deaths by suicide utilized firearms as the primary weapon. Screening in the emergency department setting can be a point of contact for at-risk adolescents and can provide an opportunity for preventative measures. In this study, we described self-reported firearm access and delineated the behavioral risk factors and demographic characteristics associated with firearm access among adolescents visiting an urban pediatric emergency department.
Methods: A cross-sectional study of adolescents over a one-year period who presented to the emergency department. Between June 2013 and June 2014, 2258 patients aged 14-24 were administered the Behavioral Health Screen (BHS), a web-based self-report screening tool, to assess their access to firearms both inside and outside the home, as well as mental health symptoms and risk behaviors. Demographic and chief complaint data were obtained through chart review. Factors associated with firearm access within the BHS were also analyzed using bivariate analysis. A logistic regression model was developed to determine the factors that were predictive of firearm access in our population. Bivariate analyses were conducted to determine the association between demographic and clinical factors and the likelihood of the screen being administered.
Results: 68% of participants were female, 30% white, and 53% African American. Presenting complaints included medical complaints (81%), trauma or assault related complaints (13%), and psychiatric complaints (6%). One out of 6 patients (15%) endorsed access to a firearm (47% reported in-home access). Male gender (AOR 1.70 95%CI: 1.31-2.20), lifetime alcohol use (AOR: 1.71; 95% CI: 1.26-2.32), lifetime marijuana use (AOR: 1.42; 95% CI: 1.02-1.97), and lifetime other drug use (AOR: 1.81; 95% CI: 1.11-2.94) were associated with firearm access. Participants who reported firearm access were also more likely to report clinical levels of lifetime suicidality (AOR: 1.50; 95% CI: 1.05-2.15) and depression (AOR: 1.49; 95% CI: 1.12-1.99). In our sample, patients who endorsed current suicidality were more likely to report 24-hour access as opposed to in-home access (OR 2.85 CI 1.24-6.54).
Discussion: This study demonstrated the notable frequency of firearm access among adolescents in an urban pediatric emergency department as well as the behavioral risk factors associated with such access. One out of six adolescents screened endorsed access to firearms. This study demonstrated significant behavioral risk factors associated with firearm access.

Male gender, substance use, and clinical levels of lifetime suicidality and depression were associated with firearm access.

M45. HOW DO ADOLESCENTS COPE VIRTUALLY WITH EMOTIONAL DROWNING?

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Background: A growing number of adolescents are seeking answers to health problems through Information and Communication Technologies (ICT), especially regarding mental health. Some studies even report that adolescents highly at risk of suicide don't seek help in person and prefer seeking help through ICT. To our knowledge, very few studies have explored the ICT help-seeking process of adolescents at risk of suicide. Thus, the aim of this study was to understand and generate a theory on the ICT help-seeking process of adolescents at risk of suicide. The objectives were to: (1) describe the use of ICT by adolescents at risk of suicide seeking help and (2) understand the ICT help-seeking process of adolescents at risk of suicide

Methods: Grounded theory methodology was used in response to these objectives to help model the help-seeking process of adolescents at risk of suicide. Data was collected through semi-structured interviews, an ICT help-seeking questionnaire and live observations of ICT help-seeking by the adolescents of this study. Theoretical saturation was reached with a total of 15 adolescents, aged 13 to 17, at risk of suicide. Data was analysed using Corbin and Strauss's paradigm model and the constant comparative method until data saturation occurred and a substantive theory was generated called the virtual emotional drowning theory.

Results: A substantive theory called the virtual emotional drowning theory emerged from this study. In order to "virtually cope with emotional drowning" (central category), adolescents tried different strategies and sometimes, more than one strategy was used in the same session. These strategies included distracting themselves, getting informed, revealing themselves and helping others. The use of these strategies resulted in emotional growth, getting help, getting temporary relief, having no changes or sadly, having an exacerbation of suicidal thoughts or an actual suicide attempt.

Discussion: Suggestions for clinical practice, training programs and future research are presented. The results of this study allow a better understanding of the use of ICT by adolescents at risk of suicide in order to develop, implement and evaluate ICT interventions that will better respond to these adolescents' needs.

M46. ARE "FALSE NEGATIVE" SUICIDE ATTEMPTS ASCERTAINED FROM ELECTRONIC MEDICAL RECORDS ACTUALLY SUICIDE ATTEMPTS?

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Background: Recent research using electronic health records has shown that routinely collected depression severity measures (Patient Health Questionnaire, PHQ-9) identify a population at risk of suicide attempt and death. Those reporting suicidal ideation on the ninth item of the PHQ-9 have a risk of approximately 4% per year of an attempt and account for approximately 30% of all suicide attempts. Those reporting thoughts of death or self-harm "not at all" have only a .4% risk of suicide attempt over a year, nevertheless, they account for

a significant number of suicide attempts (approximately 20% over one year, over 30% over two years). In an effort to understand these "false negative" attempts, this study evaluated the true prevalence of self-harm events among patients recently reporting no suicidal ideation.
Methods: Diagnosis codes from electronic medical record and insurance claims data identified persons who had a Patient Health Questionnaire (PHQ-9) ninth item score indicating no thoughts of death or self-harm followed by an incident of self-harm or possible suicidal attempt within 60 days. Review of full-text electronic health records determined whether an injury had actually occurred and whether it was intentional, possibly intentional or other.
Results: We identified 134 unique instances of a recorded diagnosis of self-inflicted injury or poisoning preceded by a PHQ9 item 9 response of "not at all" in the prior 60 days from extracted claims and electronic medical record data. Of the 118 cases with records available, review identified 20 cases with documentation of intentional self-injury (including two deaths), and four instances of injury or poisoning that were possibly intentional. Of the remaining 94 cases, 65 were visits or hospitalizations with documentation of suicidal ideation but no documentation of injury or poisoning. Five cases described remote rather than recent self-harm. The remaining 24 cases included injuries that did not seem plausible mechanisms for intentional self-harm (e.g. insect bite).
Discussion: Only 20% of suspected "false negative" attempts were verified intentional or possibly intentional self-harm events. Thus, it is possible our previously reported findings regarding risk of suicide attempt among individuals without suicidal ideation as reported on the PHQ-9 was erroneously inflated. Coding errors in data culled from the electronic medical records and insurance claims may distort the true risk of self-harm based on previous responses to the PHQ-9 and this distortion may be greatest for low frequency events such as suicide attempts after the report of no suicidal ideation. Future research should carefully validate all self-harm events that are identified from electronic records.

M47. PARENT-ADOLESCENT SUICIDE REPORT CONCORDANCE AND INTERNALIZING/EXTERNALIZING SYMPTOMATOLOGY

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Background: In the U.S., approximately 18% of adolescents report seriously considering suicide within the previous year, 15% report having made a plan, and 9% report making an attempt. Current prevention and treatment programs rely heavily on youth suicide risk screening in order to address suicide in this population, and the majority of these screening protocols rely solely on youth self-report to assess suicidality. It may be beneficial to utilize parents as additional informants in suicide risk screening protocols, as parents of adolescents with externalizing symptomatology have been found to be more likely to report suicidality than their children. The aims of this study were to 1.) compare parent-adolescent suicide report concordance among adolescents with internalizing versus externalizing symptomatology and 2.) examine whether internalizing and externalizing adolescents were more or less likely than their parents to report suicidality.
Methods: A secondary analysis was completed using data from a clinical subsample of adolescents (n = 64) recruited for a separate study. Adolescents were classified as having "externalizing" or "internalizing" symptomatology based on their t-scores on the internalizing and externalizing subscales of the Child Behavior Checklist (CBCL). To measure suicide

report concordance, an item from the CBCL asking parents about their child's suicidal talk was compared to an item from the Children's Depression Inventory (CDI-2) asking adolescents about their suicidal thoughts. A one-sided z-test for proportions was used to compare parent-adolescent suicide report concordance. Two-sided z-tests for proportions were used to compare the proportions of adolescents and parents reporting suicidal ideation for discordant pairs in each subset.
Results: No statistically significant differences were found between reports of suicidality among the internalizing and externalizing subsets of adolescents, nor were adolescents more likely than parents to report suicidal thoughts. There were higher rates of suicide report concordance among adolescents in the externalizing subset (73.0%) compared to the internalizing subset (59.3%), but this difference was not statistically significant. Among the discordant pairs in the subset of externalizing adolescents, more parents reported suicidality (60%) than adolescents (40%), but this difference was also not statistically significant. Among the discordant pairs of the subset of internalizing adolescents, significantly more adolescents (72.7%) reported suicidal thoughts than parents (26.3%; $p < .05$).
Discussion: These findings support other research showing that parents of internalizing youth are often unaware that their children are experiencing suicidal thoughts. While the results regarding externalizing adolescents were not statistically significant, they were in the hypothesized directions, with higher proportions of parents reporting suicidality than adolescents. Because of the small sample, there may have been limited power to detect results. Therefore, replication of these findings with a larger sample may be warranted. While these findings did not provide direct support for the inclusion of parents in suicide risk screening protocols, they do support the importance of educating parents about how to recognize and inquire about suicidal ideation among youth with primarily internalizing symptomatology.

M48. CALMA THE FIRST TOO-BASED APPLICATION FOR SMARTPHONES IN SPANISH FOR THE PREVENTION OF SUICIDE

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Background: Suicidal behavior is one of the leading causes of death worldwide. In Argentina, suicide rates among the population aged 15-24 have doubled in the last 15 years. To prevent suicide, it is necessary to intervene early. The time to intervene among at-risk individuals may be brief and not assessable; therefore, interventions delivered by smarphones may be a useful tool.
Methods: CALMA free download is an application designed for the prevention of suicide among adolescents and young adults by a group of researchers at the University of Buenos Aires, Argentina. It is based on tools of Dialectical Behavioral Therapy (DBT), a treatment proved effective in reducing suicidal behavior. CALMA offers strategies of emotional regulation, such as distress tolerance. It also gives the user the addresses of nearby health centers and telephone numbers that can be accessed at the time of the crisis. The intervention works with the initial choice of the emotion that the user feels and he or she rates their level of distress on a thermometer. The user then receives a series of cards that can be read or listen. These cards explain the theoretical basis of the intervention and provide instructions to carry it out. The user can decide to use or discard the card with a swipe movement. If he or she chooses to practice the intervention, after completing the intervention, a thermometer appears again to measure the degree of distress. Based on the result of this second measure,

the app follows different algorithms. If the intervention lowered levels of distress, the app continues to deliver the same type of cards; if the distress stays the same, the app change the type of intervention and if the distress increases, the app offers a card with emergency phones and connects the individual in with the nearby health centers. All user information is anonymous and complies with security standards.
Results: The app was released to the Android and IOS stores in May 2017. In October when the IASR congress will take place, we will have results related to its use in Argentina.
Discussion: "CALMA" is the first tool-based application developed in Spanish for Latin America by researchers in the field of suicide behavior from an Academic Institution. I addition, the use of the measure is free.

M49. Poster Withdrawn

M50. COMORBIDITY OF MENTAL DISORDER AFFECTS SUICIDE BEHAVIOR IN PATIENTS WITH MOOD DISORDERS

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Background: Panic disorder is associated with an increased risk of suicide attempt (Rappaport LM et al, 2014). Thus, suicide attempt may be an important intervention point for predicting and preventing suicide. Substantial information suggests that individuals who suffer from both major depression and panic disorder respond poorly to acute treatment, are more likely to remain ill over the long term, require more psychiatric treatment, and are at approximately twice the risk of suicide attempts than individuals who suffer from either condition alone (Nam YY et al, 2016). Effective pharmacological and psychological treatments of depression are important in suicide prevention (Zalsman G et al, 2016). Therefore, identifying factors that predict suicidal attempts may hold promise in reducing the personal and societal burden of suicide.
Methods: This cross-sectional study included 156 consecutive patients attending the Stress Disorders Clinic. The Mini International Neuropsychiatric Interview (M.I.N.I.5.0.0) was used for structured psychiatric interview. The current major depressive episode (A-module), panic disorder (E-module) and suicidality (C-module, while question C9 assessed for suicide attempt in a patient's lifetime) modules of the M.I.N.I. were analyzed. We used logistic regression models to estimate the odds ratio of suicide attempts (dependent variable) among subjects with a current major depression disorder and with both a current major depression disorder and lifetime history of panic disorder. Multiple logistic regression analyses were performed to adjust for differences in demographic characteristics, history of smoking and the presence of alcohol use disorder. All statistical significance was evaluated at a level of $p < 0.05$ using two-tailed tests.
Results: A total of 72/156 (46.2%) patients with current major depressive episode was analyzed. The mean age was 37.8±12.9 years, and 56 (77.8%) subjects were women. Both subjects with comorbid panic disorder 24/72 (33.3%) and those without panic disorder 48/72 (67.7%) were compared based on history of suicide attempts. Subjects with panic disorder were more likely to report a history of suicide attempts: 11/24 (45.8%) and 8/48 (16.7%) respectively; (p=0.008). Subjects with comorbid panic disorder were younger than those without panic disorder: 31±9 and 41±13 year p=0.003, respectively, were more likely to have a history of smoking (16.7% and 54.2% respectively, p=0.002) but not alcohol dependence. Univariate logistic regression showed comorbid panic disorder was significantly associated

with increased likelihood of suicide attempts (OR=4.2 (1.4-12.7) p=0.011. A multivariate logistic regression analysis was adjusted for demographic variables (age, gender, education, and income), comorbid alcohol use disorder and history of smoking. However, this association was unaffected by sequential adjustments of differences in these variables.
Discussion: Our study suggests that subjects with comorbid panic disorder were more likely to report a history of suicide attempts. According to some authors, panic and depression reinforce each other on the natural course of the illness to a point of developing either mixed or pure major depression, regardless of the primary diagnosis (Vollrath and Angst, 1989). Yet, though greatly overlapping, panic disorder and depression are two independent disorders and their combination more than the sum of two parts (Weissman et al., 1993). In relation to suicidal behavior, assuming that panic is a main determinant. These findings suggest that comorbid panic disorder in patients with current major depressive episode may independently increase the likelihood of suicide attempt.

M51. SUICIDE BEAUTIFICATION AND RELATED FACTORS AMONG JAPANESE

Terunari Kato*[1], Daisuke Kawashima[1], Shizuka Kawamoto[2], Keisuke Shiraga[3], Kenji Kawano[2]

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Background: In Japan, almost 25,000 deaths occur by suicide annually. Suicide rates are thought to be influenced by the socio-cultural context (Fuse, 1985), and Japanese literary works such as Hagakure and Bunraku (Japanese traditional puppet theater) such as Sonezaki-Shinju portray suicide beautification that might affect Japanese attitudes toward suicide (Kawashima et al., 2014). However, studies in this area are limited. The present study aimed to explore the actual situation of suicide beautification and related factors among Japanese people.
Methods: We distributed questionnaires via an internet research company covering suicide beautification, mental health (the Kessler Psychological Distress Scale; K6), and demographic variables (e.g., age, sex, and bereavement experiences). Data from 2,051 participants were analyzed using t-tests, analysis of variance (ANOVA), and hierarchical regression analysis. All participants provided informed consent and participated in this study on a voluntary basis. This study was part of a larger study of Japanese attitudes toward suicide, and was approved by the Chukyo University Institutional Review Board.
Results: First, t-tests showed significant differences between bereaved and non-bereaved participants ($t = -2.87$, $p < .01$, Cohen's $d = .14$), and between participants with K6 scores above and below the cut-off ($t = 6.39$, $p < .001$, Cohen's $d = .29$). Two-way ANOVA revealed significant main effects of sex ($F(1, 2041) = 12.20$, $p < .001$, $\eta 2 = .01$) and age group ($F(4, 2041) = 2.90$, $p < .05$, $\eta 2 = .01$), but there was no significant sex × age group interaction. Post hoc comparisons revealed the suicide beautification scores of those aged 40–49 years were significantly higher than those aged 60–69 years. A final hierarchical regression analysis model revealed suicide beautification was significantly related to sex ($\beta = -.06$, $p < .01$), bereavement experience ($\beta = .06$, $p < .05$), and mental health as scored by the K6 ($\beta = .15$, $p < .001$; R-square = .03, $p < .001$).
Discussion: Bereaved participants showed more suicide beautification than non-bereaved participants. In addition, suicide beautification differed by sex and age group; males beautified suicide more than females, and those aged 40–49 years beautified suicide more than those aged 60–69 years. Male sex, bereavement experience, and poor mental health may

reinforce suicide beautification. Regardless of these results, most effect sizes were relatively small; therefore, further study is needed.

M52. "IN THEIR OWN WORDS": A 'BIGGER PICTURE' INVESTIGATION OF WHAT MOTIVATES CHILDREN, ADOLESCENTS AND YOUNG ADULTS TO ATTEMPT SUICIDE

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Background: Suicide is complex. Current theoretical models of suicide are heavily informed by epidemiological and clinical knowledge however, no suicide is the same. Little research has investigated what motivates a suicide attempt from the perspectives of the person who makes the attempt. These perspectives are particularly absent for young people.
Methods: A systematic review of qualitative studies on the perspectives of young people aged 12 to 25 motivations for suicide was undertaken. MEDLINE, EMBASE, and PsycINFO were searched. Independent raters assessed comprehensiveness of reporting of included studies. Thematic networks analysis was used to analyse the data.
Results: From 17 studies involving 613 participants, basic and organising themes were identified and grouped into four major themes; intrapersonal, sociocultural, interpersonal and historical factors, as those directly attributed to suicide attempts. Comprehensiveness of reporting among studies was assessed, and particular subdomains identified as inadequately reported, i.e., relationships with participants, theoretical frameworks, and design and implementation of studies.
Discussion: More robust and comprehensive theoretical frameworks could enhance the knowledge base of the complex and multiple factors that motivate young people to take their own lives. This review highlighted the capacity of comprehensive qualitative inquiry to identify central themes which may otherwise be minimised or missed in clinical and epidemiological studies.
The results of this review have informed the design of a qualitative study which is currently being undertaken to investigate the self-reported motives of young suicide attempters.

M53. SUICIDAL BEHAVIOUR IN EARLY PSYCHOSIS: THE ROLE OF INSIGHT

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Background: Early psychosis is a high-risk period for suicide and suicide rates in psychosis have increased over recent years. Although several risk factors have been established, including being male, white, recent loss, previous suicide attempts, depression, illegal drug use and agitation/restlessness, the role of insight in suicide risk remains unclear. Thus, this presentation will review the literature on this topic, which reported mixed results and methodological limitations in previous studies, which were addressed in our studies.
Methods: Sample: Two large cohorts of first-episode psychosis (FEP) patients from the Institute of Psychiatry, Psychology and Neuroscience (IOPPN), (London, UK): i) the Genetics and Psychosis (GAP) study (n=112) and ii) the Aetiology and Ethnicity in Schizophrenia and Other Psychoses (AESOP) study (n=181).

Measures: Three insight dimensions (illness recognition, symptoms relabelling and awareness of the need for treatment) were assessed at baseline with the Schedule for Assessment of Insight – expanded version (SAI-E, Kemp & David, 1997). Psychopathology was measured with the Positive and Negative Syndrome Scale (PANSS, Kay et al., 1987) and the Schedule for Clinical Assessment in Neuropsychiatry (WHO, 1992), respectively.

The National Adult Reading Test (NART) (Nelson & Willison, 1991) was used to evaluate the premorbid Intelligence Quotient (IQ). The short version of the Wechsler Adult Intelligence Scale Revised (WAIS-R, Wechsler, 1981) estimated the current IQ (full scale).Executive function was assessed by the Trail Making Test (Reitan, 1958).

Other sociodemographic and clinical variables included sex, age at first contact, duration of untreated psychosis (DUP), level of education, relationship status, living status, employment status, cannabis use (yes/no) and alcohol use (yes/no).

Information on suicidal behaviours, including suicide attempts and suicide completions in accordance with O'Carroll et al. (1996)'s definitions, was taken from the medical records and patients records were linked with UK national mortality data.

Statistics: Survival analyses (Kaplan-Meier curves) and Cox-regression analyses were performed.

Results: GAP study: Although treatment compliance showed a significant bivariate association with time to first suicidal act (RR 1.36, 1.01-1.53, p=0.04), the multivariable Cox regression models revealed that living alone (RR 3.24, 1.04-10.04, p=0.01) and suicide attempts prior to FEP (RR 7.36, 2.25-24.04, p<0.01), which was significantly associated with all insight dimensions at baseline, predicted time to first suicide attempts over the 3-year follow-up.
AESOP study: No insight dimensions was significantly associated with time to first suicidal event, although illness recognition (RR 1.14, 0.98-1.34, p=0.09), treatment compliance (RR 1.30, 0.99-1.71, p=0.06) and total insight (RR 1.06, 0.99-1.13, p-0.08) showed borderline trends. On the other hand, depression (RR 1.55, 1.22-1.97, p<0.01) and a history of previous suicide attempts (RR 2.78, 0.90-8.60, p=0.07), both of which were linked with baseline insight levels, predicted time to first suicidal event over the 10-year follow-up.

Discussion: Suicidal history and depression appear to explain in large part the apparent association of insight with suicide risk in psychosis.
Specifically, no evidence was found supporting a direct relationship between insight and suicidal behaviour in early psychosis despite common assertions to the contrary, which has implications on clinical practice and future research. Intervention studies testing whether improving insight interventions reduce suicide rates in psychosis are needed.

M54. THE MICHIGAN PEER-TO-PEER DEPRESSION AWARENESS CAMPAIGN: SCHOOL-BASED PREVENTION TO REDUCE THE IMPACT OF DEPRESSION AMONG TEENS

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Background: Depression among adolescents is associated with significant disruption in school, relationships, and increased suicide risk. In response to a growing awareness of the

importance of preventing adolescent depression and suicide, the University of Michigan Depression Center (UMDC) and the Ann Arbor Public Schools developed the Peer-to-Peer Depression Awareness Campaign (P2P) in Washtenaw County Schools. This school-based program expanded from five high schools to ten between 2009 and 2016. Over 450 students have participated directly on P2P teams, with over 140 events run by P2P student educators, and program exposure to thousands of students. The goals of the project are to: 1) educate high school students about depressions and related illnesses; and 2) support them in finding creative ways to convey this knowledge to their peers in order to raise awareness, reduce stigma, and ultimately, help promote the early detection of depression and reduce suicide risk.

Methods: The intervention involved a one-day conference to teach student educators about mental health issues, suicide prevention, and prepare them to provide peer-to-peer instruction as a team. Each P2P team then developed and implemented a depression awareness campaign featuring activities tailored to fit their school. Both P2P student educators and a convenience sample of non-P2P students completed baseline and post-test questionnaires.

Results: Following campaign roll-outs, students were more knowledgeable about depression, more confident in their ability to identify and refer peers who may be depressed, less likely to keep suicidal ideation a secret, more willing to seek help for themselves, and reported lower mental illness stigma in their schools.

Discussion: The risk for onset of depression increases dramatically during the middle and high school years. Depression adversely affects developmental trajectories and is strongly associated with functional impairment; recurrent depressions later in adulthood; comorbid mental disorders; and suicidal ideation, attempted suicide, and death by suicide. Recognizing depressive illnesses as early as possible is a crucial step in managing depression more effectively and preventing negative outcomes and tragedies in our schools and communities. The vast majority of extant school-based interventions are delivered exclusively by professionals such as clinicians, school psychologists, or teachers, despite research findings that difficult-to-engage teens are more likely to listen to their peers than to well-meaning adults. The outcomes of the P2P program suggest that high school students can be trained to implement an effective peer-based prevention intervention. Moreover, currently published school-based depression prevention programs often feature a highly structured approach requiring strict adherence to detailed manuals and procedures to ensure standardization, which creates an approach that can be inflexible and difficult to adapt to the schools' needs. A clear strength of our intervention is the structured, yet adaptable nature of the program. The P2P program benefits from principal characteristics of effective prevention programming, including 1) providing contact with adults and peers in a way that promotes strong relationships and supports positive outcomes; and 2) tailoring the program to the community and cultural norms of the participants and including the target group in program planning and implementation. Community-driven prevention programs such as this can lead to high community acceptance and ownership, the potential for broader implementation across different organizations and institutions, and the opportunity to obtain immediate feedback to enhance program outcomes over time.

M55. DEVELOPMENT OF A FIREARM-STORAGE DECISION AID TO AUGMENT LETHAL MEANS COUNSELING

Marian Betz*[1], Christopher Knoepke[1], Bonnie Siry[1], Ashley Clement[1], Deborah Azrael[2], Daniel Matlock[1]

[1]University of Colorado School of Medicine, [2]Harvard Injury Control Research Center

Background: Reducing access to highly lethal methods of suicide—especially firearms—can save lives. Counseling about how to reduce lethal means access is recommended for people at risk of suicide but often does not occur in busy clinical settings like emergency departments (EDs). By using respectful, acceptable messaging, a patient-centered firearm lethal means decision aid (LM-DA) could augment current care by educating and enabling at-risk patients and their family or friends to enhance home safety. The central decision in the LM-DA is "which options to choose to reduce home access to firearms."
Methods: Following international standards for decision aid development, we are using iterative refinement and testing with stakeholder groups to finalize a paper LM-DA that will be translated into a web format for future ease of use and dissemination. Stakeholder groups include: individuals with lived experience of suicide ideation or attempts (their own or family members'); individuals who have lost a family member or friend to suicide; firearm owners; representatives from firearm organizations; ED providers; and suicide prevention professionals. Our underlying hypothesis is that the LM-DA will be acceptable to stakeholders and ultimately effective in enhancing patient-centered decision-making around home firearm access during times of suicide risk.
Results: The LM-DA includes four major sections: (1) introduction with information about firearm suicide and the rationale for reducing home firearm access; (2) scales to assist in clarification of values and preferences; (3) presentation of options for out-of-home and in-home firearm storage, including their risks/drawbacks, benefits, and approximate costs; and (4) concluding questions to motivate action. LM-DA language and visuals are attentive to messaging recommended from both the suicide prevention and firearms communities so as to offer support and guidance without being confrontational or offensive. Stakeholder interviews (scheduled for August 2017 and beyond) will provide feedback on the LM-DA acceptability and recommended modifications.
Discussion: A web-based tool offers the potential to enhance current care, decrease real-world access to lethal means of suicide, and thereby decrease short-term risk of suicide. In a subsequent pilot randomized controlled trial, we will assess acceptability, feasibility and effects of LM-DA use among patients and providers. To supplement the presentation, we will display the most recent LM-DA and solicit feedback from conference attendees.

M56. COMMUNICATION ABOUT SUICIDE HISTORY, FUTURE SUICIDE RISK, AND DESIRED INTERVENTIONS WITHIN MILITARY COUPLES

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Background: Romantic partners play an important role in suicide risk – they can function either as risk or protective factors. One the one hand, married individuals generally have significantly lower suicide death and attempt rates than individuals who have never married, are divorced, or are widowed. On the other hand, relationship problems are one of the most commonly endorsed precursors to a suicidal crisis. Despite this paradox, very little is known about suicide communication or risk assessment within the context of married couples. The current study sought to address this gap by investigating the concordance between self-reported and partner-reported suicide history, communication about suicide, and future suicide risk within romantic couples.
Methods: Couples were drawn from a larger study of suicide risk in military partners. Each partner reported his or her own suicidality via the Self Injurious Thoughts and Behaviors

Interview (SITBI; Nock et al., 2007). Next, each individual reported on his or her understanding of his or her partner's suicidality via a lightly edited self-report version of the SITBI (e.g., "Has your partner ever had thoughts of killing him/herself?"). Concordance between self-report and partner-report of suicide history, communication about suicide, and future suicide risk were examined. Participants also answered questions about types of interventions they may find helpful.

Results: Of the 40 individuals (20 couples) interviewed thus far, 37% reported a history of ideation and 17% reported a history of suicidal behavior (i.e., aborted, interrupted, or actual attempt). Concordance was examined within couples reporting suicidality. The majority (73%) of individuals correctly identified their partners' history of ideation. The minority (20%) of individuals correctly identified their partners' history of suicidal behavior. Most individuals found out about their partners' suicide ideation history by being told directly (83%). Regarding risk for future suicide ideation, only 14% of individuals thought there was any likelihood that their partners would consider suicide in the future, while 48% of the partners actually reported some likelihood of future ideation. Sixty percent of participants reported they would be interested in a suicide-specific couples intervention.

Discussion: Romantic partners may be a source of both stress and support during a suicidal crisis. However, little is known about the degree to which couples communicate with each other about their suicidality. These results suggest that though many individuals were aware their partners had suicidal thoughts, many fewer knew their partners had acted on these thoughts. Further, individuals underestimated the likelihood that their partners would be at risk of suicide in the future. Increased communication between members of a couple about suicide behavior history and concerns about future suicidal ideation may be useful in reducing future risk. Specific interventions designed to include both the suicidal individual and his or her partner may aid in such communication and were desired by participants. Limitations include the small sample size and limited generalizability outside of military couples.

M57. SOCIAL EMOTIONAL LEARNING IN NYE COUNTY SCHOOLS FOR UPSTREAM SUICIDE PREVENTION: A QUALITATIVE EVALUATION OF CAMP MAKEBELIEVE KIDS

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Background: Camp MakeBelieve Kids (CMB Kids) is a comprehensive social and emotional learning (SEL) curriculum designed for elementary school students that was developed to promote universal prevention strategies for healthy populations. Research has identified leading outcomes of SEL programs as the improvement of attitudes, behaviors, and performance in students. Positive attitudes include factors such as a higher sense of self-efficacy, improved coping with school stressors, and increased understanding of the consequences of behavior. Reductions in aggression and interpersonal violence, better conflict resolution skills, and less substance use are among some of the behavior outcomes associated with SEL programs. These areas of improvement are linked with increasing protective factors and decreasing risk factors for mental illness, substance abuse, and ultimately, suicide. The goal of this study is to assess the fidelity of the CMB Kids program implementation and the feasibility of future program implementation in a classroom setting.

Methods: The CMB Kids 8-hour program was implemented in 5th grade classrooms of 3 elementary schools in a rural county in Nevada during the 2016-17 school year. During implementation, qualitative data was collected through two main methods. First, lesson observations were conducted consisting of completing a fidelity checklist to determine the consistency with which each lesson was taught and to note differences in the classroom environment and teaching style for each school social worker (SSW). Second, semi-structured interviews were conducted with SSWs who implemented the program and with classroom teachers after all 3 schools had received their program. Individual interviews were conducted with each of the SSWs teaching the program, while small group interviews were conducted with 5th grade teachers who observed the program's implementation in their classrooms.
Results: Each SSW (n=2) was observed twice; observations were conducted during the final two lessons of the CMB Kids program during the Spring 2017 semester. Significant differences were recorded in classroom environment – teaching individual classrooms versus all 5th grade students together – and in teaching style. We found the number and content of activities differed for each SSW. These differences affected student engagement with the program, as well as the opinions of teachers regarding the relevance and effectiveness of the program for their students. Interviews with SSWs yielded recommendations for improving the program's training procedures as well as specific examples for how to revise the program to make it more classroom and grade compatible. Interviews with teachers highlighted how teaching style and program content influenced their opinion of the program. Overall, teachers did approve of teaching SEL in school curricula, but were hesitant to recommend the CMB Kids program without further revision to some lesson activities and implementation procedures.
Discussion: The results of this study describes the feasibility of future implementation of the CMB Kids program in elementary schools and provide a detailed context for the quantitative data collected during this evaluation. As the program was only implemented in 9 classrooms over 3 schools, future research should incorporate the suggested revisions for improving the feasibility of classroom-based and school-wide implementation and re-evaluate the program in a larger scale setting with a more diverse population. Ultimately, the CMB Kids program is an innovative strategy for bringing SEL into the classroom; with continued improvement, implementation, and evaluation, it may prove to be an effective, universal upstream strategy for suicide prevention in schools.

M58. MENTAL HEALTH SERVICE PREFERENCES AND UTILIZATION AMONG WOMEN VETERANS IN CRISIS: PERSPECTIVES OF VETERANS CRISIS LINE RESPONDERS

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Background: Women Veterans are at increased risk of suicide compared to non-Veterans, but little is known with regard to mental health service preferences and needs of women Veterans in crisis.
Methods: This study used a qualitative, secondary source key informant interview method to ascertain the experiences of women Veterans in crisis from 54 responders working at the

Veterans Crisis Line (VCL). Transcribed interviews were analyzed to identify facilitators and barriers to mental health services for women Veterans in crisis as well as ways of better engaging women Veterans in essential VA and non-VA services.
Results: VCL responders indicated that for women Veterans calling the VCL, private sector care concerns were primarily related to cultural sensitivity to veterans; private care satisfaction was grounded in provider relationships and availability of specialty care. VA health care concerns were related to appointment wait times, limited service options and locations, gender sensitive care, and care environments that were inhospitable to survivors of military sexual trauma (MST); VA health care satisfaction was grounded in provider familiarity with "military culture," close provider relationships, and continuity of care. Responders generally suggested that the barriers limiting VA access for women Veterans are perceived as similar to barriers to non-VA care.
Discussion: These findings suggest that caller experiences with providers and clinic staff appear to drive satisfaction with mental health services, both within and outside of the VA healthcare system. Within the VA, there are incremental opportunities for improving care for women Veterans and leveraging crisis line call responders' perspectives based on encounters with women Veterans in crisis to improve these women's access to needed mental health services.

M59. THE USE OF AN ACTIVE CONTROL CONDITION IN A RANDOMIZED CONTROLLED TRIAL FOR VETERANS IN SUBSTANCE USE TREATMENT AT RISK FOR SUICIDE

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Background: Nearly 43,000 die by suicide every year in the United States. Well-designed randomized trials are needed to determine the efficacy of new and existing interventions to reduce suicide. However, most of studies of suicide-specific interventions compare an active therapeutic intervention against 'treatment as usual', where the patient has access to available treatment resources but does not receive a matched level of contact with a therapist. We have therefore developed the Supportive Psycho-Educational Control (SPC) condition, which provides a novel scientific contribution in that it provides the same amount of therapeutic contact, however, specific therapeutic techniques are not provided during sessions. The purpose of the SPC condition is to allow for a test of the efficacy of the content of the CBT condition above and beyond the overall benefit of therapeutic relationship between a patient and therapist.
Methods: The present study is a multi-site randomized control trial (final N=300) evaluating a Cognitive Behavioral Therapy (CBT) intervention for suicide prevention for Veterans with Substance Use Disorders versus an attention matched control condition – Supportive Psycho-Education (SPC). Both conditions are comprised of eight individual therapy sessions and are intended to be delivered twice per week during Substance Use Disorder outpatient treatment to individuals who report current suicidal thoughts. The SPC condition is designed to match the CBT condition in terms of level of attention and the non-specific aspects of receiving support for a suicidal crisis and substance misuse. Participants are randomly assigned to a condition following the completion of their study enrollment interview.
Results: The SPC condition is a manualized, time-limited individual therapy intended to be delivered over eight total sessions, each 1-hour in length. Sessions are designed to help

patients to better understand the resources available during a suicidal crisis and how substance use impacts various aspects of their life. The primary focus of the sessions is on providing education and factual information about consequences of substance use. Resources are provided regarding both suicide and substance use that allow the patient to learn more about the reasons underlying their feelings or their experiences as someone with a substance use disorder, and to make connections between substance use and suicide. Topics related to psychological factors associated with suicidal thoughts and behaviors and possible psychosocial coping mechanisms, however, are not a part of the formal content of these sessions. The main goal of the therapist in this condition, then, is to be a supportive resource for the patient and to provide them with options on how to deal with certain aspects of their lives, but does not specifically work with the patient on practicing any of those specific skills in session.

Discussion: Although this study is still actively recruiting, preliminary data suggests that patients report their participation in the SPC sessions as beneficial. Sixty-nine percent of those randomized to the SPC condition have completed all 8 therapy sessions, and 81% have completed at least 4 sessions. Patients receiving the SPC condition typically describe the sessions as helpful, report participating actively in the sessions, and feeling comfortable discussing issues around suicide and substance use with their therapist. The use of a control condition within randomized controlled trials will allow for better efficacy testing to identify which components of therapy are beneficial in suicide prevention above and beyond therapist contact.

M60. EXPLORING THE ACCEPTABILITY OF A COMPUTERIZED INTERVENTION FOR ANXIETY SENSITIVITY IN OEF/OIF VETERANS WITH MTBI TO MITIGATE SUICIDE RISK

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Background: Anxiety sensitivity (i.e., fear of fear; AS) is a well-established risk factor for mental health conditions (e.g., post-traumatic stress disorder and depression), and has been consistently associated with suicide risk. Research also suggests that AS may impact the speed and quality of recovery from traumatic brain injury (TBI). Recently participation in a single-session computerized cognitive anxiety sensitivity training (CAST) was associated with significant decreases in AS, which in turn mediated reductions in suicidal ideation. Given these findings and the association between AS and relevant risk factors for Veteran suicide, CAST may have utility as an upstream suicide prevention intervention. However, the acceptability and feasibility of delivering CAST has not been examined among Veterans or individuals with a history of TBI. The objective of the proposed paper presentation is to report study findings about the acceptability and feasibility of CAST when used by Veterans with elevated cognitive AS and a history of mild TBI (mTBI).

Methods: Twenty-five OEF/OIF Veterans with a history of mTBI and current anxiety sensitivity will complete IRB approved study procedures. Participants complete a single study session including clinical interviews, self-report measures, and the CAST intervention. Primary outcomes are acceptability and feasibility of the CAST intervention in this sample.

Acceptability, defined as Veterans' perceived suitability of the intervention, is being assessed by a self-report questionnaire and a qualitative interview. Feasibility, or the ease of administering the intervention, is being assessed by study eligibility, enrollment, and completion rates. Exploratory analyses will examine changes in AS pre-to post-intervention.
Results: Fourteen participants have completed the intervention to date. Initial acceptability results show that 65% of Veterans are satisfied with the intervention. Initial feasibility results suggest some barriers related to recruitment and technological difficulties. Final analyses on the target sample of 25 participants will be completed prior to the proposed presentation.
Discussion: Findings from the current study are helping to guide modifications to the intervention and the implementation of computerized interventions to administer within large healthcare networks. We posit that results from this study will lay the ground work for future research aimed at evaluating the efficacy and effectiveness of computerized interventions aimed at mitigating negative mental health outcomes, such as suicide, among Veterans.

M61. SUICIDE PREVENTION INTERVENTION FOR HOSPITALIZED MIDDLE-AGED AND OLDER ADULTS

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Background: Adult suicide rates in the US have increased from 2000-2015 and suicide rates for middle-aged and older adults are alarmingly high. Among adults aged 50 years old and older, suicide rates increased from 13.9 to 18.4/100,000 and suicide deaths almost doubled from 2000 to 2015. The highest risk group for suicide is older white males 85 years or older (Suicide rate in 2015: 52.5/100,000). The risk is even higher for patients who have been hospitalized for active suicidal ideation or a suicide attempt.
Methods: This presentation will describe the development and preliminary data of a novel emotion-regulation based psychosocial intervention designed to reduce suicide risk in middle-aged and older adults (50-90 years old) who have been discharged after a suicide-related hospitalization (i.e. for active suicidal ideation or suicide attempt).
Results: The intervention is based on the assumptions that: a) suicidal ideation and behavior may be conceptualized as failed attempts to regulate negative emotions and b) improving cognitive reappraisal, a well-documented and effective emotion regulation strategy, may be one way to reduce suicide risk in high risk populations.
Specifically, the intervention identifies triggers of negative emotions that are associated with suicidal ideation and suicide attempt and develops simplified, easy to use cognitive reappraisal techniques to reduce these negative emotions during the first 3 months after hospital discharge. The intervention employs environmental adaptations/aids to assist patients in utilizing cognitive reappraisal techniques between sessions (a personalized tablet app, written step-by-step plan, phone calls). Preliminary data support the feasibility and acceptability of the intervention, and provide a signal of improvement of emotion regulation and an association of emotion regulation with reduction in suicidal ideation.

Discussion: Patients hospitalized following acute suicidal ideation or attempt are at high suicide risk during the early post-discharge period, especially within the first 3-months after discharge. Psychosocial interventions aimed at reducing suicide risk after a suicide-related hospitalization for middle-aged and older adults are limited. Our cognitive reappraisal may help reduce suicidal ideation and suicide risk in middle-aged and older adults recently hospitalized for active suicidal ideation or a suicide attempt.

M62. RESEARCH ON PSYCHOSOCIAL INTERVENTIONS FOR MIDDLE-AGED AND OLDER ADULTS HOSPITALIZED FOR SUICIDALITY: OPPORTUNITIES AND CHALLENGES

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[1]Weill Cornell Medical College

Background: According to the latest CDC data, suicide is the 15th leading cause of death in adults aged 50+ in the US. Middle aged and older adults with mood disorders who have been hospitalized for suicidality (i.e. active suicidal ideation or suicide attempt) are at high suicide risk, especially within the first 6 months after hospital discharge. Psychosocial interventions for this high-risk population are limited. To address this need, AFSP has funded an on-going RCT of two psychosocial interventions for middle-aged and older adults after their hospital discharge. The aims of this presentation are: a) to describe the demographics and clinical characteristics of the sample; b) to discuss the stressors that precipitated the hospitalization; and c) to highlight the challenges of recruiting this high suicide risk group and of administering psychosocial interventions post-discharge.

Methods: Participants (N=27) were recruited from the inpatient units of Weill Cornell Medicine/New York Presbyterian Hospital. Assessments included Demographic Questionnaires, Montgomery-Asberg Depression Scale (MADRS), Hamilton Rating Scale for Depression (HAMD), Columbia-Suicide Severity Rating Scale (C-SSRS), and Client Satisfaction Questionnaire (CSQ). Participants were randomized into two interventions: Problem Adaptation Therapy for Suicide Prevention (PATH-SP) and Supportive Therapy (ST). Because the study is on-going, we will not present any interim analysis of clinical outcomes.

Results: Participants were middle aged and older adults hospitalized for suicidality (52% females and 48% males; 68% Caucasian, 32% African-American; 95% Non-Hispanic and 5% Hispanic; Mean age: 63.1). They were severely depressed (Mean HAMD: 36.3, std= 4.6; Mean MADRS: 37.2; std= 4.5). The mean C-SSRS score for Suicidal Ideation at admission was 3.1 (std= 1.6); 21% had an actual suicide attempt or aborted suicide attempt at admission, and an additional 13% had a history of suicide attempts. Stressors included pain and physical illnesses (29%), financial difficulties (19%), interpersonal stressors (19%), and feelings of isolation (24%). Participants were very satisfied with both treatments [CSQ: Mean 3.5 (std= 1.4)]. Challenges of recruitment were: short hospital stay, poor social support, and stigma towards research. Challenges of the administration of psychosocial interventions included: financial stressors, interpersonal tension with significant others, poor adherence to medication treatment, substance abuse, and significant negative emotions such as anger, guilt, helplessness, and anxiety.

Discussion: Preliminary analysis shows that our sample exhibits severe depression and active suicidal ideation (with or without intent or plan). Risk factors for hospitalization include history of pain and physical illnesses, financial stressors, and interpersonal stressors. Recommendations for successful recruitment of participants include a protocol developed in collaboration with unit staff and participation of therapists early in the recruitment process to establish rapport. Addressing financial stressors, interpersonal tension, and adherence to medication treatment may facilitate the administration of psychosocial interventions post-discharge.

M63. QUALITY OVER QUANTITY: SOCIAL NETWORKING AND SOCIAL SUPPORT IN DEPRESSED AND SUICIDAL ADOLESCENTS

Delaney Jones*[1], Alison Athey[1], James Overholser[1], Jalessa Perez[1], Jennifer Lehmann[1]

[1]Case Western Reserve University

Background: Self-disclosure in friendships has been shown to buffer against peer victimization and depressive symptoms in adolescents (Adams et al., 2012). Friendship instability (Chan et al., 2008), such as not sharing with best friends (Laird et al., 2013), has been associated with depressive symptoms in adolescents. Adolescents who have had suicide attempts are ten times more likely to report dissociated relationships with friends and feelings of not being heard (Hedeland et al., 2016).

The present study investigated the relationships between frequency and quality of social interactions and depressive symptoms and suicidal ideation in adolescent inpatients. Frequency of social interactions, or amount of in- person contact with peers, and quality of social interactions, amount of self- disclosure with friends, was examined. Social interactions may not buffer against depression or suicidal ideation unless they are meaningful and adolescents can share personal problems with friends.

Methods: The study evaluated 128 adolescent inpatients, ages 12-17. The data was composed of 69% females and 81.7% Caucasians. Subjects had a mean age of 14.79 (SD = 1.24). Two subgroups were evaluated: patients with a history of self-harm (N=39) and patients with no previous history of self- harm (N=49). Depression severity was assessed using the Children's Depression Rating Scale- Revised (CDRS-R; Poznanski et al., 1984). Self- reported levels of depression were assessed using the Children's Depression Inventory (CDI; Masip et al., 2010). Suicidal ideation in the self-harm subgroup was measured using the Suicide Intent Scale (SIS; Stefansson et al., 2012). Frequency of social interactions were evaluated using the question "how often have you seen your close friend in the past month?". Quality of social interactions were evaluated using the question "how often have you shared with your close friend in the past month?". Subjects responses to social interaction questions were assessed on a Likert-type scale ranging from 0 (never) to 4 (always).

Results: Correlations were evaluated between depression and suicidal ideation variables (SIS scores for the self harm group, CDRS-R scores and CDI scores) and social interaction variables. In the subsample with self-harm, the negative correlation between quality of social interactions and CDI scores was medium ($r = -.329$, $p < .05$). The negative correlation between quality of social interactions and CDRS-R scores ($r = -.257$, $p < .05$) was almost medium. In the subsample with no self harm, the positive correlation between frequency of social interactions and CDI scores ($r = .253$, $p < .05$) was small. All remaining bivariate correlations were small and non-significant.

Discussion: The results suggest that in adolescents with a history of self- harm, higher depression scores are associated with lower scores for quality of social interaction (less sharing with friends). In adolescents that have never self- harmed, high frequency of social interactions (seeing friends more often) is associated with greater depression scores. This may suggest that social interactions with peers may not buffer against depression if there is a lack of self-disclosure in friendships. Depressed adolescents who engage in high levels of social interaction may not seek out adequate emotional support. Friendships may protect against depression when adolescents can share with friends and see them as always available and accepting.

Limited statistical power because of the modest sample size in the present study may have played a role in limiting the significance of some of the statistical comparisons conducted. Data collection is ongoing.

M64. THE EFFECTIVENESS OF PSYCHOTHERAPY CLASSES IN REDUCING SUICIDAL THINKING IN A CRISIS POPULATION

Natalie Mota*[1], Maxine Holmqvist[1], Jitender Sareen[1], James Bolton[1]

[1]University of Manitoba

Background: Although scientific research has shown that certain psychotherapies are effective in reducing suicidal thinking, plans, and attempts, there can be several barriers to accessing these treatments despite urgency for intervention. The current study aims to develop a prospective patient cohort in order to examine the effectiveness of rapid access classes that teach introductory coping skills for reducing suicidal ideation and other mental health symptoms in a population presenting with a mental health crisis.
Methods: Two psychotherapy classes are currently offered at a mental health crisis response center in Manitoba, Canada: 1) The Cognitive-Behavioral Therapy with Mindfulness (CBTm) Course covers topics such as relaxation strategies, cognitive restructuring, goal setting, and an introduction to exposure therapy principles. 2) The Managing Difficult Emotions (MDE) Course is adapted from Dialectical Behavior Therapy (DBT) and safety planning skills, and introduces patients to mindfulness, emotion regulation, distress tolerance, and interpersonal effectiveness skills, as well as to the primary components of a comprehensive crisis plan. Patients referred to these psychotherapy classes typically begin participation within two to three weeks of their crisis-related visit to the centre. Consenting study participants will complete the Beck Scale for Suicidal Ideation as well as several other measures assessing current symptoms of depression, anxiety, and emotional difficulties. Upon completion of the classes, participants will complete the same outcome measures. Participants who do not attend all classes will be contacted and administered the measures by phone. An intention-to-treat analysis with last observation carried forward will be used to examine changes in suicidal ideation. Type of class (MDE vs. CBTm) and number of sessions attended will additionally be evaluated as predictors of decreases in suicidal thinking.
Results: Final results will be presented at the International Summit on Suicide Research.
Discussion: If effective, these classes could provide a low-resource, rapid access, introductory and brief psychotherapy option for individuals who are at higher risk of dying by suicide and have time-sensitive mental health needs.

M65. CAMS DRIVERS OF SUICIDE AND THEIR RELATION TO TREATMENT PLANNING

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[1]The Catholic University of America

Background: Historically, the approach to assessing suicidality in patients was to identify suicide "risk factors," defined as a range of largely psychosocial variables that correlate with suicide attempts and completions (O'Conner & Nock, 2014). More recently, some researchers have focused on potential indicators of more imminent suicide risk by seeking to

identify suicide "warning signs" (Rudd et al., 2006). Suicide warning signs are constructs that relate to near-term acute risk (Rudd et al., 2006). While both risk factors and warning signs are considered important for the research of suicidality, only a single warning sign (anger/aggression) has been found to relate to imminent risk of suicide resulting in limited clinical utility (Gunn, Lester, & McSwain, 2011). To further enhance the clinical effectiveness of suicide assessment Jobes et al (2016) have proposed the idea of "suicidal drivers" which compel the patient to consider suicide. Patient-defined suicide drivers are central to treatment planning within the Collaborative Assessment and Management of Suicidality (CAMS; Jobes, 2016). Tucker et al (2015) have noted that suicidal drivers are patient-specific suicidal warning signs and the construct may represent a new light on our efforts to better identify and ultimately treat suicidal risk. However, the practical process of incorporating drivers within practice and treatment research has been somewhat challenging. Previous work has revealed that drivers identified within CAMS research were often equivalent to risk factors and warning signs and perhaps not specific enough (Siegelman & Jobes, 2015). It was posited that drivers were being conceptually equated to risk factors or warning signs due to the lack of an optimal operational definition (Siegelman, Gregorian, & Jobes, 2016). Consequently, based on CAMS research data, drivers were operationally defined as 1) the patient specified context that creates greatest risk of suicidal behavior and 2) the meaning the patient ascribes to understanding and fully appreciating that context. Analyses according to this operational definition found that drivers significantly related to treatment plans. Given that these constructs are assessed on an ongoing basis throughout the CAMS protocol, we posit that over time 1) drivers and 2) treatment plans will increase in precision, and 3) the relationship between the two will become stronger.

Methods: We will use three archival data sets: 1) suicidal Soldiers from the Operation Worth Living (OWL) study in a South-Eastern US military installation (n = 73), 2) college student clinical trial sample (n = 31), 3) post-hospitalization clinical trial sample (n = 27). Session 1 drivers and corresponding treatment plans were previously coded according to the operational definition (0=no criteria met; 1=at least one criterion met).

Results: Based on this coding, analyses revealed that drivers significantly related ($\chi^2(1, N=130) = 5.09$, $p=.02$) to their corresponding treatment plan. Now, data will be coded with more precision (0=no criteria met; 1=one criterion met; 2=both criteria met) to provide more variability for analyses. Latent growth analysis will be conducted to model change in driver specificity and treatment plan specificity over 5 time points. In addition, relations between these constructs across time points will be examined.

Discussion: At its core, CAMS is focused on identifying and treating suicidal drivers, but the relationship of drivers to CAMS treatment planning has never been established statistically. This study seeks to explore the change of drivers and their treatment plans to provide us with a statistical perspective into the clinical utility of the drivers-focused treatment that is central to CAMS.

Poster Session II

T1. Poster Withdrawn

T2. CLINICAL CUT-OFF SCORES FOR THE MILITARY SUICIDE RESEARCH CONSORTIUM COMMON DATA ELEMENTS

Fallon Ringer*[1], Anna Gai[1], Megan Rogers[1], Carol Chu[1], Matt Schneider[1], Thomas Joiner[1]

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Background: The Common Data Elements (CDEs) were developed to assess suicidality and related risk factors, including anxiety sensitivity, insomnia, alcohol use, and symptoms of Posttraumatic Stress Disorder (PTSD), in military populations. The shortened CDE measures assessing these constructs exhibited good reliability and validity (Ringer et al., under review). The current study's aim was to establish cut-offs scores for the CDEs for individuals experiencing suicidal ideation, individuals with previous suicide attempts, and individuals with a previous history of multiple attempts and resolved plans.

Methods: Participants (n = 4,748, Mage = 33.7, 65.9% male, 65.1% White) included military service members, veterans, and civilians aggregated from 19 funded studies. The CDEs were administered at baseline data collection over the phone, online, or in-person depending on the site of data collection. Protocol for each study varied by study site. The CDEs are comprised of items from existing measures assessing suicide risk and related risk factors as well as unique items assessing relevant risk factors (i.e., non-suicidal self-injury). The Modified Scale for Suicide Ideation (MSSI; Miller, Norman, Bishop, & Dow, 1986) was used to assess for suicidal ideation, previous suicide attempts, and resolved plans or preparations. Receiver Operating Characteristics (ROC) were utilized to establish cut points. ROC curves and ROC areas under the curves (AUCs) were calculated for the CDEs to measure diagnostic test performance. Cut-off points were determined by the maximum Youden's index value (Youden, 1950). We examined the ROC analyses and curves for predicting various levels of suicide risk using the CDEs.

Results: For current suicidal ideation, ROC analyses revealed that the CDEs exhibited good predictive value (AUC = 856, SE = .009, $p < .001$, 95% CI [.839, .873]). The optimal cut-off point which maximized sensitivity and specificity, as determined by Youden's index (J = .563), was 76 (sensitivity of 85.2% and specificity of 71.1%). For a history of previous attempts, ROC analyses revealed that the CDEs exhibited fair predictive value, (AUC = .747, SE = .008, $p < .001$, 95% CI [.731, .762]). The optimal cut point as determined by the Youden index (J = .390) was calculated as 60 (sensitivity of 82% and specificity of 56.9%). For individuals with a history of multiple attempts and resolved plans or preparations, the CDEs exhibited good predictive value (AUC = .856, SE = .009, $p < .001$, 95% CI [.838, .873]). The optimal cut point for identifying these individuals was 81 (J = .563, Sensitivity of 80.3% and Specificity of 75.9%).

Discussion: Results demonstrated cut points for the CDEs which may be used to distinguish between individuals at various levels of suicide risk. Established cut-offs may aid clinicians and researchers in identifying individuals at risk for suicide; however, future studies should examine the predictive value of the CDEs in a longitudinal design.

T3. EFFECTS OF MODE OF PROCESSING ON COGNITIVE REACTIVITY TO SUICIDAL IMAGERY

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Background: Suicidal behaviour is the most adverse outcome of depression and the most consistent symptom across depressive episodes. Because depression is highly recurrent, treatment of patients engaging in this behaviour is extremely important, yet finding effective treatments for this group remains a challenge. Experimental designs identifying mechanisms underpinning persistent suicidality are required. It is our theoretical premise that the proximal use of a discrepancy-based processing mode to deal with low mood and suicidal intrusions is a key mechanism in exacerbating suicidal crises1. In this mode, self-regulatory activity is directed towards discrepancies between current and desired states, which has been shown to manifest in avoidance, rumination and ove o or-general autobiographical memory, and both reduced problem-solving and impaired specificity of future thinking in our previous work. We hypothesise that rather than the pathology-specific negative thinking in itself (e.g., suicidal ideation), the maladaptive self-regulatory processes triggered by such thinking (e.g., rumination and avoidance) maintains suicidal symptoms. We hypothesise that by modifying responses to suicidal intrusions, the tendency for suicidal intrusions to escalate into persisting suicidal crises or suicidal acts is reduced. Our theoretical framework points us towards decentered processing (i.e., seeing thoughts as mental events) as an adaptive alternative mode of processing. The aim of the current study was to test experimentally whether mode of processing of aversive suicidal urges predicts cognitive reactivity to a challenge task.
Methods: Participants were a) 18 -70 years, had b) ≥ 3 episodes of depressive episodes (DSM−IV criteria for recurrent MDD), c) a history of recurrent suicidal ideation (SCID) and/or behaviour (SASII and BSS-W), were d) currently well and e) giving consent. Exclusion criteria were lifetime symptoms of a) OCD, b) substance abuse, c) bipolar disorder, d) schizophrenia and e) visual impairments or cognitive difficulties. Following a baseline identification of suicidal imagery pertaining to the worst ever episode, participants were randomly assigned to a discrepancy-based or decentered mode of processing condition involving a mode induction paradigm2 followed by a challenge task (i.e., bring to mind the suicidal image). Outcome measures were suppression (WBSI), attempts to cancel effects (VAS scale), depression (BDI) and mindfulness (FFMQ).
Results: There were no significant differences in baseline characteristics between groups (n=12 and n= 13) before randomisation, nor post-randomisation differences on the urge to cancel effects or trait mindfulness. Group predicted WBSI, i.e.; the decentered condition predicted thought suppression, persisting after adjusting for age and gender but not when accounting for number of depressive episodes. An interaction effect was found between number of previous depressive episodes and intervention on depression scores (BDI).
Discussion: The findings lend support to the hypothesis that a decentered mode of processing short-circuit maladaptive self-regulatory processes involved in maintenance of suicidal ideation. Replication in larger samples examining the impact of mode of processing on mood and behavioural urges is required.

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T4. SOCIAL COGNITIVE ABILITIES IN PSYCHOTIC PATIENTS WITH SUICIDAL BEHAVIOR

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Background: Suicidal behavior has been shown to be associated with limited interpersonal connections. The ability to read other people's emotions guides social behavior and might possibly be altered in people with suicidal ideation. Previously, it was shown that patients with suicidal behavior responded differently while viewing angry faces compared to neutral ones. Individuals diagnosed with psychotic diseases have an increased risk for suicidal behavior, thus more research is needed to reveal possible risk factors for this group. In this present study, we therefore hypothesized a restriction in facial emotional recognition for psychotic patients with suicidal behavior.

Methods: Data pertained to the baseline measures of the Dutch national Genetic Risk and Outcome in Psychosis (GROUP) project. Suicidal behavior during the last three months was assessed with the Camberwell Assessment of Need. From the larger dataset, we selected psychotic patients with suicidal behavior in the preceding period to the measurement (n=31); these were compared to 31 non-suicidal patients matched on age and education. For social cognition, a Degraded Facial Recognition (DRF) task was administered. During this task participants had to indicate the emotion of 64 pictures including neutral, happy, fearful and angry expressions. To increase the difficulty of the tasks, pictures were shown with 75% and 100% intensity. We used a 2 (group) by 4 (condition) repeated measures analysis of variance (ANOVA) to determine the difference between the suicidal and non-suicidal psychotic patients on the DFR task.

Results: A significant main effect of condition was found ($F(3,58) = 39.23$, $p < .001$), with lower scores for the angry and fearful emotions compared to neutral and happy ones. No main effect of group was found ($F(1,60) = .74$, $p < .79$). There was no interaction between group and condition ($F(3,58) = .14$, $p = .94$).

Discussion: The results of this study did not show support for an association between suicidal behavior and the ability in emotion recognition. It could be proposed that differences in social cognition are more subtle than could be measured with the current task. Perhaps differences are more pronounced on the level of brain activation. The assessment of suicidal behavior may also not be optimal, as no dedicated suicide questionnaire was used. In addition, regression analyses including potential confounding variables such as level of depressive symptoms and general cognitive ability may be in place. This analysis was limited by the absence of a healthy control group. A further step for this study will therefore be the inclusion of this group, data for which are available from the GROUP project.

T5. THEORY BEHIND ELECTRODERMAL HYPOREACTIVITY AND SUICIDE

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[1]Emotra AB

Background: Several psychophysiological studies of electrodermal hyporeactivity and suicide comprising more than 2500 depressed patients have unanimously shown that electrodermal hyporeactivity is strongly related to suicide and other suicide behavior in depressed patients.

Methods: A specially designed habituation test of electrodermal specific orienting responses to acoustic stimuli was given to patients in a depressive episode. In the latest and largest of the studies the patients were followed up for suicidal behavior one year subsequent to the test. The study was naturalistic, enabling the use of the test result as a compliment in clinical suicide risk assessments and suicide prevention measures.
Results: In writing moment, the results are not completely analysed. The results will be reported in another presentation in the 2017 IASR / AFSP International Summit on Suicide Research.
However, all results taken together call for the formulation and presentation of a theory of the neuropsychological mechanisms behind the hyporeactivity and suicide common to hyporeactivity and suicide.

Discussion: Information from own and other research indicates that the neuropsychological factor is a dysfunction of neurons involved in the orienting responses in hippocampus CA3 areas. The causes and possible cures and the consequences from that dysfunction for other behaviors will be discussed. The ultimate consequences of the proposed dysfunction are proposed to be a loss of biological ability to normally react emotionally and cognitively to events in everyday life making the victim psychologically prepared to leave the insipid life, and, further, a loss of fear of impending experiences of pain, making the victim capable to perform the suicidal act.

T6. TRAJECTORIES OF SUICIDAL IDEATION OVER 6 MONTHS AMONG 482 OUTPATIENTS WITH BIPOLAR DISORDER - THE CHOICE TRIAL

Ole Köhler-Forsberg[1], Trine Madsen*[2], Ida Behrendt-Møller[2], Louisa Sylvia[3], Andrew Nierenberg[3], plus 14 more

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Background: Suicidal ideation occurs frequently among individuals with bipolar disorder; however, its course and persistence over time remains unclear. We aimed to investigate 6-months trajectories of suicidal ideation among adults with bipolar disorder.
Methods: The Bipolar CHOICE study randomized 482 outpatients with bipolar disorder to 6 months of lithium- or quetiapine-based treatment including adjunctive personalized treatment (other psychotropic medications as clinically indicated). Participants were asked at 9 visits about suicidal ideation using the Concise Health Risk Tracking scale. We performed latent Growth Mixture Modelling analysis to empirically identify trajectories of suicidal ideation. Multinomial logistic regression analyses were applied to estimate associations between trajectories and potential predictors.
Results: We identified four distinct trajectories. The High group represented 11.0% and was characterized by constant suicidal ideation. The Unstable group included 2.7% with increasing thoughts about suicide, which decreased at the end of follow-up. The third (Persistent-low, 19.3%) and fourth group (Persistent-very-low, 67.0%) were characterized by low levels of suicidal ideation. Higher depression scores and previous suicide attempts predicted membership of the High group, whereas randomized treatment did not.
Discussion: More than one in ten adult outpatients with bipolar disorder reported persistent suicidal ideation throughout 6 months of pharmacotherapy. The identified predictors may help clinicians to identify those with additional need for treatment against suicidal thoughts

and future studies need to investigate whether targeted treatment (pharmacological and non-pharmacological) may improve the course of persistent suicidal ideation.

T7. PERSONALITY AND VULNERABILITY TO SUICIDE IN THE ELDERLY – A SYSTEMATIC LITERATURE SEARCH COMPARED TO A CASE-CONTROL STUDY

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Background: Of all personality traits, impulsive-aggressive traits in general and borderline traits in particular have been most strongly established as risk factors for suicide in young and middle-aged adults. However, these traits appear to diminish with aging. Thus, it has been suggested that other personality profiles may play a greater role in late-life suicidal behavior. Despite several studies about personality and suicidal ideation as well as psychological autopsy studies on the subject, there persists a lack of in-vivo research on personality and suicidal behavior in late life. We address this gap in knowledge through two complementary approaches: (1) a systematic literature review integrating existing evidence regarding personality and suicidal behavior in old age, and (2) a case-control study of dimensional and categorical personality profiles in attempted suicide.

Methods: First, a systematic literature search was conducted on PubMed, Google Scholar and PsychInfo using key words grouped in three descriptor fields: "personality", "suicide" and "elderly". After additional reference tracking, 28 articles were retained.

Second, a preliminary analysis was conducted on a sample of 81 individuals aged ≥ 60 (mean age: 66.19), composed of 12 high-lethality attempters, 11 low-lethality attempters, 12 ideators, 19 depressed and 27 healthy controls. These 5 groups were compared regarding both the Five-factor model of personality (by NEO-FFI self-reports), and six DSM personality constructs, namely narcissistic, borderline, antisocial, obsessive-compulsive, avoidant and schizotypal traits (by semi-structured SIDP-IV interviews).

Results: Literature review: Individuals who die by suicide in old age were often described as possessing anankastic (obsessive-compulsive) and, to a lesser extent, avoidant personality traits. In contrast, borderline traits and narcissistic personality disorder were found to be positive predictors of suicidal ideation in the elderly. Based on the Five-factor model, older suicide victims tended to display higher conscientiousness and lower extraversion than healthy controls. Older attempters were characterized by higher neuroticism than both depressed controls and suicide victims, as well as by lower levels of extraversion than healthy and depressed controls. Suicide ideators were consistently associated with higher levels of neuroticism than healthy and depressed controls. Study results: We found that both low- and high-lethality suicide attempters displayed higher levels of borderline traits than depressed controls. Avoidant traits were significantly higher in low-lethality attempters than in healthy controls. Regarding the Five-factor model, ideators showed significantly lower levels of extraversion than healthy controls. Conscientiousness was significantly lower in depressed than in healthy controls. There was a progressive increase in conscientiousness going from depressed controls to high-lethality attempters, but this finding did not reach significance.

Discussion: Our systematic review indicated that personality profiles in the elderly tended to vary throughout the suicide spectrum, with higher neuroticism and Cluster B traits more strongly related to suicidal contemplation, and higher conscientiousness and Cluster C traits

to death by suicide. Extending the existing literature, our study found an association between attempted suicide in old age and borderline personality features, which have been linked to suicidal ideation, as well as with avoidant traits, which have been associated with death by suicide. Thus, those elderly who attempt suicide appear to constitute a mixed group of individuals resembling both suicide ideators and completers.

T8. MENTAL HEALTH SERVICE UTILIZATION AMONG LATINOS WITH SUICIDAL IDEATION

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Background: Evidence suggests that both structural and cultural barriers can affect mental health service use for Latinos, which vary across age, gender and nativity status. Research has found that many Latinos prefer to not turn to mental health services first, but resort to family, general physicians, or non-professional sources of help. However, few studies have exclusively examined Latinos and factors that predict their mental health service use. Because those with prior history of suicidal ideation (SI) are at particularly elevated risk of making suicide attempts, the current study aims to study a sample of suicidal Latinos and identify factors that predict mental health service utilization.

Methods: Survey data from 263 self-identified Latino adults (Mean age = 38.78, SD = 14.16) with a history of suicidal ideation were drawn from the 2002-2003 National Latino and Asian American Survey (NLAAS). Bivariate logistic regression analyses were conducted to predict mental health service utilization, using relevant socio-demographic, clinical, or culturally relevant variables as predictors.

Results: Results identify specific factors that statistically predict which suicidal Latinos utilize mental health services. Bivariate logistic regressions indicated that number of DSM diagnoses, seeking comfort in religion, personal and social perception of needing treatment, history of suicide attempt, and use of alternative therapies were significant positive predictors of professional mental health treatment (ORs=1.29-5.32, CIs=1.01-13.01, ps<.05), while subjective ratings of good mental health and social strain among extended family were significant negative predictors of professional mental health treatment (ORs=0.66-0.74, CIs=0.44-0.97, ps<.05). Demographic factors (i.e., gender, age, household income, and employment status) and culturally relevant variables (i.e., English language proficiency, family cohesion, generational status) were not significant predictors of service utilization in this sample (ORs=0.66-1.67, CIs=0.37-3.33, ps>.05).

Discussion: Results from this study support past research showing that, overall, markers of clinical severity were positively associated with mental health treatment utilization. Social strain from extended family was also associated with treatment utilization, such that the greater social strain statistically predicted less utilization. Results also suggest that seeking non-professional sources of help or comfort (e.g., religion, alternative therapies) could mark general help-seeking tendencies overall, as this was positively associated with mental health treatment utilization among Latinos with SI. Finally, contrary to previous literature, demographic factors and select culturally-relevant variables were not significantly associated with mental health treatment utilization. Subsequent analyses will enter these distinct factors into a multivariate model.

T9. HARNESSING THE POWER OF CULTURE, IDENTITY AND CONNECTEDNESS FOR UPSTREAM SUICIDE PREVENTION

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[1]Johns Hopkins, [2]Johns Hopkins, White Mountain Apache

Background: American Indian/Alaska Native youth experience high suicide mortality rates in the United States compared to same-aged peers of other races/ethnicities. Within American Indians/Alaska Natives, tribal variability impacts suicide rates. The White Mountain Apache Tribe (WMAT) is actively working towards reducing suicide-related outcomes among youth through a variety of evidence-based programs. One such program is the Elders' Resiliency Curriculum. The Elders' Curriculum is a school-based prevention intervention program. This program focuses on resilience against suicide ideation, suicide attempts, and substance use by promoting strengths through traditional Apache culture, increasing familial and community connections, and promoting healthy conflict resolution.
Methods: Every month one to two elders deliver a 45-60 minute lessons including, but not limited to, traditional knowledge, songs, as well as self-esteem, self-worth, endurance, gender roles, responsibility, and family. The five specific aims of the Elders' Curriculum include: 1.) improve mental health status, 2.) increase social connectedness, 3.) reduce discrimination and loss of culture, 4.) increase spirituality, and 5.) increase cultural identity participation in traditional practices. Study participants include Apache youth enrolled in three local schools. Youth complete monthly evaluations examining youths' comprehension of content areas and satisfaction with the curriculum. In addition, pre- and post-test data are collected measuring the five specific aims (within first month of initial lesson) and after conclusion of the final Curriculum lesson utilizing self-report questionnaires.
Results: Findings from a pre/post evaluation conducted with N=125 students supported the initial acceptability and impacts of the program, for example: 100% satisfied, and 94% could write self-esteem (sha' oldii), self-worth (tan ilini) in Apache. Quotes from students provided further preliminary support: "I loved this lesson. I liked the part when she talked about how the mule was trapped down the well. Even when everything was hopeless, he just shook it off."
Discussion: This intervention program represents a innovative and unique strengths-based suicide prevention intervention program to bolster resiliency against suicide-related outcomes among WMAT youth. It is in line with research demonstrating the importance of protective factors and community connectedness against suicide in American Indian communities.

T10. SECRETS AND SILENCE: EXPLORING THE ROLES OF GENDERED OPPRESSION AND SEXUAL VIOLENCE AMONG LATINA SUICIDE ATTEMPTERS

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Background: In the United States, Latina youth consistently have higher rates of suicide attempts than their White female peers. Health disparity researchers attribute the rates of suicide attempts among Latina youth to historical exclusion, discrimination and oppression faced by Latino families, which prevents access to culturally appropriate interventions. However, researchers and practitioners rarely examine how unaddressed gendered oppression may be a catalyst for suicidal behavior, particularly among minority girls. This qualitative paper proposes how the silencing of gendered oppression and sexual violence within the context of Latino families may contribute to suicidality among Latina teens.

Methods: The sample included twenty Latina adolescents (N=20), ten suicide attempters and ten non-attempters. Girls and their parents or guardians completed semi-structured interviews as part of a larger mixed methods study on Latina youth and suicide attempts. To achieve family-level analysis of individual interviews, family case summary analysis focused on the family dynamics by synthesizing individual data across the family members. The final framework derives from the first coding of family case summaries and is validated by additional coding of interviews using a finalized codebook. Family case summaries were coded and analyzed according to several themes, particularly the roles of secrets and silence surrounding oppressive experiences and the symbolism of the daughter within the family.
Results: For families, the daughter was a source of redemption for past violence and adversity experienced by the parents. Mothers and female guardians particularly discussed their own experiences of gendered oppression and how they wished for their daughters to have academic and career success before becoming pregnant or marrying. Inadvertently, parents established strict rules and expectations for their daughters to follow, regarding dating, home life, and school work. Attempter youth often struggled with meeting family's expectations as a Latina daughter, and this could result in disapproval of the daughter within the family. The daughter kept secrets specifically regarding negative emotions, dating, or sexual violence, because of family disappointment or fears of rejection. Secrets and silence surrounding histories of sexual violence or gendered oppression within the family were also mentioned in attempter case summaries. The weight of unaddressed family violence and feelings of rejection from the family crippled the daughter's development of her sexuality and personal identity. The burden of silence and secrets, fears of rejection, and the redemptive symbolism of being a Latina daughter contributed to the daughter's decision to attempt suicide.
Discussion: This paper intends to inform social science researchers and family practitioners of the nuanced intergenerational dynamics that may maintain gendered oppression within minority families and potentially result in youth suicidal behavior. Few models of suicidality explore if or how the child's suicide attempt represents a family history of gendered oppression and marginalization. This paper suggests that the identification of gendered oppression and domestic violence are essential in understanding how and why minority adolescents attempt suicide. To prevent and address youth suicidality, both the daughter's, and the family's experience of gendered oppression, violence, and silencing must be acknowledged and explored.

T11. RE-DEVELOPMENT OF MENTAL HEALTH FIRST AID GUIDELINES FOR SUPPORTING ABORIGINAL AND TORRES STRAIT ISLANDERS WHO ARE EXPERIENCING SUICIDAL THOUGHTS

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Background: Suicide is a leading course of death among Indigenous Australians. Friends and family and non-Indigenous frontline workers are often best positioned to provide initial assistance if someone is suicidal. Culturally appropriate expert consensus guidelines on how to provide mental health first aid to Australian Aboriginal and Torres Strait Islanders who are experiencing suicidal thoughts were developed in 2009. Our study has re-developed these guidelines to ensure they contain the most current recommended helping actions.

Methods: The Delphi consensus method was used to elicit consensus on potential helping statements to be included in the guidelines. These statements describe helping actions that Indigenous community members and non-Indigenous frontline workers can take, and information they should have, to help someone who is experiencing suicidal thoughts. A panel was formed, comprised of 27 Aboriginal and Torres Strait Islanders who are experts in Indigenous suicide. The panelists were presented with the helping statements via online questionnaires and were encouraged to suggest re-wording of statements and any additional helping statements that were not included in the original questionnaire. Statements were only accepted for inclusion in the guidelines if endorsed by ≥ 90% of panelists as essential or important.
Results: From a total of 300 statements shown to the expert panel, 172 were endorsed as helping statements to be including in the guidelines.
Discussion: Aboriginal and Torres Strait Islander suicide experts were able to reach consensus on appropriate strategies for providing mental health first aid to an Aboriginal and Torres Strait Islander experiencing suicidal thoughts. The re-development of the guidelines has resulted in more comprehensive guidance than the earlier version, which contained only 52 endorsed statements. The re-developed guidelines will form the basis of a suicide gatekeeper training short course for Indigenous community members and non-Indigenous frontline workers that will be evaluated in an upcoming trial.

T12. A CROSS-CULTURAL EXAMINATION OF SUICIDE STATUS FORM RESPONSES

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Background: Globally, an estimated 800,000 people die by suicide each year (World Health Organization [WHO], 2014). The epidemiological variations in suicide rates across the world point to the potential role culture plays in the experience of suicidality. Although suicide is widely regarded as a potentially preventable death, meaningfully reducing suicide rates has proven to be a challenge. In direct response to the need to clinically treat suicidal risk, Jobes (2012; 2016) developed a suicide-specific therapeutic framework called the "Collaborative Assessment and Management of Suicidality" (CAMS). Central to CAMS-guided care is the "Suicide Status Form" (SSF), which is a multipurpose assessment, treatment planning, tracking, and outcome-oriented clinical tool (Jobes, 2016). The SSF is among the few suicide risk assessment instruments that applies both quantitative and qualitative methods.
Methods: This exploratory cross-sectional and descriptive study investigated potential differences and similarities of the experience of suicidality between suicidal patients from six different nations (China, Denmark, Ireland, Norway, Switzerland, and the USA). First session quantitative and qualitative responses to Section A of the SSF completed by N= 362 suicidal patients engaged by CAMS-guided care were examined.
Results: Results evidenced significant differences across various quantitative and qualitative variables. Specifically, differences were observed between patients' ratings of the SSF Core Assessment constructs and their wish to live/wish to die ratings. Qualitative differences were also observed, specifically among the SSF Core Assessment constructs, reasons for living/reasons for dying, suicidal motivation, and One-Thing Response. Several similarities were also observed across both quantitative and qualitative assessments. Specifically, patients did not differ in terms of ranking the SSF Core Assessment constructs in order of importance and no differences were found between patients' suicidal orientation.

Discussion: Various factors (e.g., sample, setting, severity of risk), along with culturally-driven differences and similarities of the suicidal experience were explored. This was the first-ever study to explore detailed psychological differences of the suicidal experience across this many nations.

T13. Poster Withdrawn

T14. DOES RELIGIOSITY PREVENT SUICIDE? THE ASSOCIATION BETWEEN RELIGIOUS IMPORTANCE & SUICIDALITY: AN INTERNATIONAL ASSESSMENT

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Background: While religiosity has been found to be a protective factor against suicide in sociological work, it has received relatively little attention in suicidology. In addition, existing work has been disproportionately based on the US and other developed nations following the Judeo-Christian cultural tradition. Little work is based on less developed nations and nations in other culture zones of the world including those following Buddhism, Hinduism, Islam, and Confucianism. The present study addresses these limitations by using data on a large number of respondents representing a diversity of culture zones of the world. Hopelessness, an important risk factor in psychiatric models of suicidality (e.g., Aaron Beck), is also a centerpiece of much lesser known sociological work on religious commitment, which reduces suicidality through promotion of hope. Many of the world's religious systems, including Christianity, Judaism, Islam, and Buddhism, provide a promise of a life after death. This is through such associated beliefs as those in heaven or reincarnation. An afterlife can provide adherents with hope for a reality better than that of their present, which can include anguish from psychiatric disorders, unemployment, divorce, physical illness, deaths of loved ones, substance abuse, and other social-psychiatric strains. Previous work on diverse global populations has found that those who report receiving strength and comfort from their religious beliefs tend to be lower in suicidality. However, work based on within nation variation for countries following Eastern as well as Western religions is relatively lacking. The present study fills this gap by analyzing the association within each of 80 nations drawn from all of the world's culture zones and major religious faiths.

Methods: All data are taken from the fifth wave of the World Values Surveys. Suicidality is measured by the suicide acceptability item: "Please tell me whether or not you think that suicide can always be justified (=10), never be justified (=1), or somewhere in between (index from 1 through10). A log transformation was employed to adjust for skewness. Suicide acceptability has been shown to predict suicide attempts and completions. Religiosity is measured by the one item (which is correlated with other items) for which data are available for the maximum number of nations: "How important is religion in your life?" from 1=not at all, through 10=very important. As in previous work controls are incorporated for demographics (e.g. age, sex), marital integration, financial strain, reported health, and a cultural macro axis of tolerance (self expressionism). Complete data were available for 174,883 individuals nested in 80 nations.

Results: Controlling for the other predictor variables, religiosity was inversely associated with suicide acceptability in 64/80 nations. In 19 nations it was the strongest predictor. The association was robust in Buddhist nations (e.g., Japan, adjusted Beta=-.151, p=.000;Thailand aB=-.159,p=.000), Confucian (e.g., South Korea aB=-.194, p=.000; but not

China aB=-.050,p=.111), Hindu (e.g., India aB=-.036, p=.007), Islamic (e.g., Jordon aB=-.076,p=.000; Turkey aB=-.149,p=.000), Orthodox (e.g. Romania aB=-.104, p=.000;Russia aB=-.094, p=.000)., and Christian (e.g., Slovenia aB=-.145, p=.000; US aB=-.276, p =.000).
Discussion: The analysis determined that in nearly all nations: the greater the importance of religion, the lower the suicide acceptability. This association persisted in 64 nations after it was adjusted for cultural, demographic and other constructs. Future work is needed to assess the mechanisms by which religion lowers suicidality & helps to prevent suicidality.

T15. CHILDHOOD MALTREATMENT AND SUICIDALITY: AN INVESTIGATION OF THE RELATIONSHIP BETWEEN CHILDHOOD MALTREATMENT, ACQUIRED CAPABILITY FOR SUICIDE AND SUICIDAL BEHAVIOR

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Background: Several studies provide evidence for an existing relationship between childhood maltreatment and suicidal behavior across the lifespan. Our aim is to examine this association by using the Interpersonal Psychological Theory of Suicide (IPTS), consisting of three constructs. While feelings of thwarted belongingness and perceived burdensomeness are predictive for suicidal ideation, acquired capability (AC) is a precondition of turning this ideation into suicidal behavior. Besides investigating the direct relationship between childhood trauma and suicidal behavior, this study focusses, in line with the assumptions of the theory, on the potentially mediating role of AC on this relationship.
Methods: Psychiatric inpatients with unipolar depression and lifetime suicidal ideation or –behavior were included (N = 74). For the assessment of childhood maltreatment, the Childhood Trauma Screener (CTS) was used. Suicidal behavior was measured with the Suicide Behaviors Questionnaire-Revised (SBQ-R) and AC with the German Capability for Suicide Questionnaire (GCSQ). To test the expected relations, multiple linear regression analyses were calculated. In all analyses, we controlled for depressiveness (Rasch-based Depression Screening, DESC-II) and sex.
Results: While there was no significant direct relationship between childhood maltreatment and suicidal behavior in the entire sample, childhood traumatization acted as a significant predictor for AC ($\beta = .432$, $p < .001$), which itself predicted suicidal behavior ($\beta = .374$, $p = .001$). The same pattern was found in the female subsample. Male participants tended to report suicidal behavior more often (MMale(SD) = 11.5 (3.82)) than female (Mfemale(SD) = 9.86 (3.13), $p = .061$, $T = 1.904$, $d = -0.484$). Furthermore, we found a relationship between childhood maltreatment and suicidal behavior in male participants ($\beta = .443$, $p = .03$), which decreases when including AC into the regression ($\beta = .265$, $p = .23$).
Discussion: In line with the IPTS, AC is associated with suicidal behavior. However, childhood trauma does not seem to act as a direct risk factor for suicidal behavior but predicts AC. As the direct relationship between childhood trauma and suicidal behavior failed to reach significance, we hypothesize that childhood trauma might be associated with one part of AC, while suicidal behavior might be associated with another part of it. Interestingly, a gender-specific analysis revealed the association between childhood trauma and suicidal behavior to be mediated by AC in men but not in woman. This might be caused by different qualitative and quantitative characteristics of the traumatization. Further research including the other constructs of the IPTS and suicidal ideation is needed.

T16. CAN CHILDREN UNDER 12 YEARS OLD BE SUICIDAL?

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Background: Although completed suicide attempts in children of less than 12 yrs old is a rare phenomenon, suicidal ideations and behaviors are more common (Stordeur, 2015, Greydanus, 2007). In 2011, 36 children died by suicide in metropolitan France (Vandervoode, 2016). Moreover, in the U.S.A, 12 % of children between 6 and 12 had suicidal ideations and 8 to 10 % of all the Americans stated that they attempted suicide during their childhood (Horowitz and coll. 2014; Horowitz and coll. 2012). According to Greydanus and coll. (2010) many adults including health care professionals had a difficult time considering that children might want to kill themselves. Child and Adolescent psychiatric nurses are regularly in contact with children who present suicidal ideations and/or behaviors (Horowitz and coll., 2014). Therefore, nurses need to know more about this unknown phenomenon.
Methods: This literature review on the suicidal risk of children under 12 presents studies with a systemic approach based on Bronfenbrenner model (1979). Search engines used were: Pubmed, Web of Sciences, Embase, CINHAL, PsyInfo and Google Scholar. The key words used alone and in combination were, “children”, “kids”, “youngsters”, “suicide’ suicidal risk”. A literature review was completed in French and in English. Articles from 2005 to 2015 were retained. 120 articles were found but 9 responding to the criteria of our research were analysed in depth.
Results: Boys aged 12 and under make more lethal attempts than girls of the same age. Children under 12 turn to substance abuse, hanging and strangulation as a means to try to kill themselves. These children often have a conflictual relationship with one of their parents. Children under 12 can be more impulsive than adolescents. Although children with depression have a higher suicidal risk, depression is not the only mental illness that can be a risk factor for children under 12. The literature reveals that children diagnosed with ADHD are also at risk. Even though this age group may not have acquired the understanding for the concept of death, they still can want to kill themselves and are at risk for self-harm
Discussion: Even though there are few studies, we think that the prevalence of ideation and suicidal behaviour of children under 12 is under reported. This can be explained in part by the fact that most of these children won't consult for physical care therefore are not seen in hospital or clinic. Another explanation could be that it’s hard for adult to believe that children want to kill themselves. Nurses who work with children especially in children mental health need to know about the phenomenon. It's crucial that children under 12 who are suicidal be assessed as they need to learn coping strategies prior to adolescence.

T17. FEMALE LABOR FORCE PARTICIPATION AND SUICIDE RATES IN 50 DEVELOPED COUNTRIES

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Background: Suicide rates in men are generally higher than in women in most parts of the world. Whether increased women’s participations in the labor market are related to patterns of suicide rates in both genders are not known.

The current study aims to illustrate male to female suicide rate ratios in the world and to explore the correlations between female labor force participation and suicide rates in males and females. We further explore whether the relationships between female labor force participation and suicide rates vary according to the development conditions of a given country.

Methods: Male and female suicide rates obtained from the World Health Organization Statistical Information System were used to illustrate suicide sex ratios in the world. Graphical illustrations of female labor force participation rates and sex-specific suicide rates, stratifying by Human Development Index were presented. Spearman's correlation coefficients were calculated.

Results: Higher level of female labor force participation rates were related to lower suicide rates in both genders in countries with more advanced human development (Male: r= -0.56, P=0.005; Female: r=-0.59, P=0.003); whereas higher women's labor force participation rates were associated with higher suicide rates in countries with relatively less advanced level of human development, however, the correlation was not statistically significant (Male: r= 0.41, P= 0.07; Female: r=0.40, P=0.07).

Discussion: The relationship between egalitarian gender norms and suicide rates very according to national context. Our results suggest that a greater egalitarian gender norms benefited both men and women in countries equipped with better human capabilities.

T18. RISK FACTORS FOR SUICIDE DEATH AFTER ACUTE CARE HOSPITALIZATION FOR DEPRESSION: CLINICAL MARKERS AND PATTERNS OF CARE CONTACTS

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Background: Approximately a third of people that die by suicide have a mental-health related hospitalization during the year prior to death. The time after discharge is a known high risk period, yet the vast majority of hospitalized patients do not subsequently die from suicide. Identifying specific risk factors for suicide post-hospitalization is paramount, and to enhance precision this should be examined within specific diagnostic groups such as patients with depression.

Methods: A cohort study of all patients hospitalized in the Province of Ontario with a primary diagnosis of unipolar major depression. Data source was a probabilistic data linkage between the Office of the Chief Coroner of Ontario and the Institute for Clinical Evaluative Sciences, which houses provincial government health care administrative data. An accrual period from 2005-2013 resulted in a total sample of 90,024 subjects. Follow-up period was 12-months after date of discharge. Demographic, clinical, and health care contact variables were compared between subjects that subsequently died by suicide and those that were alive 12-months post-hospitalization.

Results: A total of n = 942 suicide deaths were identified, comprising 1.04% of hospitalized patients with depression. The suicide group has a significantly decreased likelihood of post-discharge contact with primary care (43.5% vs. 67.8%, $p < 0.001$) or outpatient psychiatry

(52.0% vs. 67.1%, $p < 0.001$) despite having significantly higher likelihood of all health care contact types during the year prior to hospitalization. Significant risk factors for suicide death included male sex, older age, higher education level, being widowed / separated / divorced, hypertension, congestive heart failure, cognitive disorder, sleep problems, irritability, substance use, personality disorder and prior ED visits for self-harm. There were no differences based on urban / rural status, income, or presence of comorbid diabetes, cancer, or eating disorder.

Discussion: While only a small minority of patients hospitalized for depression die from suicide in the subsequent year, there are important sociodemographic, clinical, and health care contact differences between suicide decedents and controls. A pattern suggesting drop-off of care contacts post-hospitalization in the suicide group raises many questions about access, need, and enabling factors that require further exploration. Identified risk factors primarily reflect the available literature, while reinforcing the presence of modifiable factors such as cardiovascular comorbidities, sleep impairment, irritability, and substance use.

T19. MAPPING SUICIDE MORTALITY IN OHIO: A SPATIAL EPIDEMIOLOGICAL ANALYSIS OF SUICIDE CLUSTERS AND AREA LEVEL CORRELATES

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Background: Suicide is a major public health problem. In 2014, suicide was the 10th leading cause of death for all ages, the 2nd leading cause of death for ages 10-34, and the 4th leading cause of death for ages 34-54 years. From 1999 through 2014, the US suicide rate rose from 10.5 per to 13.0 per 100,000 persons, increasing 24% across every age group except the elderly. Men die by suicide nearly four times more often than women in the US, with white males accounting for 7 out of 10 suicides in 2014.

Suicide rates also vary widely across geographical areas. Previous studies have investigated spatial patterning and associations of area characteristics with suicide rates in Western and Asian countries, but few have been conducted in the United States. This study aims to: 1) identify spatial and spatio-temporal clusters of high suicide rates in Ohio; and 2) assess the relationship between demographic and socioeconomic contextual factors and suicide clusters. A suicide cluster may be defined as a higher number of suicides occurring within a defined space and/or time than would otherwise be expected for a particular region. Understanding the spatial distribution of suicide can inform the planning, implementation, and evaluation of suicide prevention efforts.

Methods: This ecological study included all people who died by suicide in Ohio between January 1, 2004 to December 31, 2013. Suicide decedents were identified from death certificate data obtained from the Ohio Department of Health. Deaths by suicide were identified based on the International Classification of Diseases, 10th revision (ICD-10) external cause of death codes (X60-X84, Y87.0, *U03). The unit of analysis in defining a suicide cluster was the census tract (N= 2, 952). To identify suicide clusters, each suicide case was assigned to a census tract based on the residential address before death recorded in the death certificates.

Census data were used to obtain measures of census level neighborhood characteristics. Because these variables were highly correlated, principal component analysis with Varimax rotation was used to create latent variables. Using the 16 variables obtained from the 2008-2012 American Community Survey and the 2010 Area Resource File resulted in three area-level latent variables: economic deprivation, density of providers, and social fragmentation. Logistic regression was then used to examine the association between the three latent variables and being in a high-risk suicide cluster.

To identify the spatial distribution of suicide and test for clustering, spatial and spatio-temporal scan statistics were used to detect high-risk clusters of suicide at the census tract level.

Results: Nine statistically significant ($p < 0.05$) high-risk spatial clusters and two space-time clusters were identified. The risk of suicide was up to 2.1 times higher in high-risk clusters than in areas outside these clusters (relative risk ranged from 1.22 to 2.14, $p<0.01$). In the multivariate model, factors strongly associated with area suicide rates were socio-economic deprivation (Odds ratio [OR] = 3.4, 94% CI = 2.6-4.5) and density of providers (OR = 0.35, 95% CI= 0.27-0.46).

Discussion: Statistically significant high-risk spatial clusters were identified; most were in major cities and rural counties located in the Appalachian regions of Ohio. Heightened community wide suicide risk is associated with socioeconomic deprivation and lower levels of provider density relative to other communities. Efforts to reduce poverty and improve access to health and mental health services on the community level represent potentially important strategies to prevent suicide.

T20. SUICIDE IDEATION AND DEPRESSIVE SYMPTOMS AMONG POLICE OFFICERS

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Background: The police culture and environment is a fertile area in which suicidal thoughts can prevail. Few coping resources combined with frequent exposure to traumatizing experiences may create an environment which is conducive to aggressive behavior. This aggression may be expressed via suicidality, which is particularly salient when officers have ready access to firearms. The aim of this cross-sectional study was to assess associations between depressive symptoms, hopelessness and suicide ideation among police officers.

Methods: A total of 271 Buffalo, NY police officers completed questionnaires, which were used to assess demographic characteristics, suicide ideation (Joiner Suicide Inventory [JSI]), hopelessness (Beck Hopelessness Scale [BHS]), depressive symptoms (the Center for Epidemiologic Studies Depression Scale [CES-D], and the Beck Depression Inventory [BDI]). JSI is a 4-item instrument that reflects suicidal thoughts (each statement ranges from 0=no thoughts about suicide to 3=thinking of suicide). A participant is considered to have suicide ideation if he/she reported any thought of suicide, i.e. sum of all four items ≥ 1. The BHS is a 20-item true-false self-report instrument that assesses the degree to which a person holds negative expectations about the future. Nine of the items are keyed false and 11 true. The items are summed to obtain a total hopelessness score. The CES-D scale is a 20-item measure of depressive symptoms. Participants rated each item on a 4-point scale according to how often the symptoms occurred in the past 7 days: 1 (rarely or none of the time, less than 1

day), 2 (some or little of the time, 1-2 days), 3 (occasionally or a moderate amount of the time, 3-4 days), and 4 (most of all of the time, 5-7 days). The BDI is a 21-item self-reported instrument intended to evaluate 21 symptoms of depression: 15 related to emotions, 4 related to behavioral changes, and 6 related to somatic symptoms. Each symptom is rated on a 4-point intensity scale, ranging from 0 (Not at all) to 3 (Severely). The items are summed to obtain a total depressive scores, with higher scores representing more severe depressive symptoms. Unadjusted and age-sex-race/ethnicity adjusted mean depression and hopelessness scores were assessed across the suicide ideation groups (yes/no) using analyses of variance/covariance.

Results: The mean age of the officers was 48 years, 28% were women, and 72% were married. Four percent (n=11) reported suicide ideation in accordance with the Joiner scale. Adjusted mean values of CES-D, Beck depression and hopelessness differed significantly between suicide ideation groups (Mean±SE: 21.6±2.0 vs 8.0±0.4, 16.9±1.6 vs 5.6±0.3, 6.2±0.7 vs 1.9±0.1, respectively, with $p<0.001$).

Discussion: Although a small number of officers reported any thought of suicide on the Joiner scale (n=11), it was interesting that those who had any suicidal thoughts had higher scores of depression and hopelessness than those who did not. The majority of officers reporting suicidal thoughts had a higher number of years of service indicating a longer exposure to police work. Further inquiry with a larger sample and a prospective design are needed.

T21. Poster Withdrawn

T22. THE PSYCHOLOGY OF LONE WOLF TERRORISM: APPLICATIONS IN SUICIDE RESEARCH AND ETHICAL CONSIDERATIONS

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Background: Terrorist acts perpetrated by single individuals, or Lone Wolf Terrorists, have become increasingly prevalent in today's society. Lone wolf terrorists are individuals influenced by, but not necessarily belonging to, any terrorist groups. Despite the large amount of attention seen in recent history mainly due to widespread media, there has not been much empirical psychological research that seeks to understand the influences and ultimately, the suicidality of these perpetrators. Past research has focused on the link between personality traits and early childhood trauma or abuse and yet has found no distinct associations.

Methods: The current research methodology of studying Lone Wolf Terrorists is highly controversial. Typically, published findings are based on interviews conducted with individuals after they have committed acts of terrorism. Meta-analyses reveal that researchers so far have relied on information about lifestyle histories and information about subjects' customs, habits, and personality factors. Unfortunately, these methodologies are often minimally shared or in some cases may be classified, leading to ambiguity in interpreting the findings or being able to replicate the research.

Results: Current research has focused on terrorist vulnerability toward radicalization due to feelings of injustice and humiliation with whomever they view responsible whether it be a person, policy, or nation. Research has also found that identity and belonging to a terrorist group may be a vulnerability that is not unlike non-terrorist groups such as the military; a sense of duty to their organization and their comrades. Finally, research is beginning to show that scholars are now looking at terrorism as "normal" psychology and not "pathology."

Ethical considerations have also been a focus in several studies as it relates to the methodology of utilizing interviews with individuals who have committed terrorist acts. Key differences between ethical requirements and the law are also examined.
Discussion: Current research calls for greater transparency and interview structure. Research has been conducted on current and future models that could assist operational psychologists in navigating their ethical roles in military combat support operations will be further discussed. Further, difficulties in research on the psychology of terrorism as a rapidly evolving and politically charged topic, including gaining funding, access to data, publication, and other aspects will be explored. We propose a model for ethical research design for understanding psychological issues with this population. Ultimately, this poster will highlight the common factors found in Lone Wolf Terrorist psychology and well as their level of potential for suicidal thoughts and behaviors prior to their attacks.

T23. SEX DIFFERENCES IN SUICIDAL BEHAVIORS, AGGRESSION, AND ORBITOFRONTAL CONNECTIVITY IN UNITED STATES VETERANS

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Background: Female veterans are the fastest growing demographic group in the US Department of Veterans Affairs. Approximately two million of the 21.9 million veterans in the US are female (National Center for Veterans Analysis and Statistics, 2016). A significant number of female and male veterans experience a host of physical and psychiatric concerns, including suicidal behaviors. Prior research has shown a strong association between suicidal behavior, mood, and aggression (Gvion & Apter, 2011). However, few studies have examined clinical and neurobiological correlates by sex. The current study was completed to examine the relationship between these variables in female compared to male veterans.
Methods: Participants consisted of 205 veterans (female n=47, male n=158) between the ages of 18 and 55. All participants completed measures of suicidal behavior (Columbia Suicide Severity Rating Scale), aggression (Buss-Perry Aggression Questionnaire), mood (Hamilton Anxiety Rating Scale and Hamilton Rating Scale for Depression). A subset of these participants also completed a resting state MRI (rsMRI) imaging protocol.
Results: Males reported higher levels of physical aggression, verbal aggression, anger, hostility, and total aggression compared to females. In males, lifetime suicidal behavior including ideation and attempts was correlated with physical aggression, verbal aggression, anger, hostility, and total aggression. In females, however, lifetime suicidal ideation was related only to hostility. Lifetime suicidal ideation was correlated with symptoms of anxiety and depression in both males and females. There were no between-group differences in measures of suicidal behaviors or in anxious or depressive symptoms. Additionally, there were no between group differences on demographic features including age.
Resting state imaging data for 17 female veterans and 24 male veterans for also were analyzed using left and right seed regions of the orbitofrontal cortex (OFC). Regression analyses were conducted to observe the relationship between resting state connectivity and self-reported aggression. Male veterans showed decreased connectivity between the left OFC and left angular gyrus associated with increased physical aggression scores. Male veterans also demonstrated increased connectivity between the right OFC and the right cerebellum and

right angular gyrus, which was associated with increased scores on revenge planning. Females did not show significant correlations between measures of aggression and the functional networks examined.

Discussion: These findings suggest significant differences in the relationship between suicide and aggression and in the relationship between aggression and resting state connectivity in female compared to male veterans. Future research should focus on the association between OFC connectivity, aggression, and suicidal behavior by sex with the goal of improved treatment for both sexes.

T24. IL-2 IN PLASMA IS SIGNIFICANTLY DECREASED IN POSTPARTUM SUICIDAL IDEATION AND SUICIDE ATTEMPTERS COMPARED TO CONTROLS

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Background: Biological mechanisms of postpartum suicidality is still uncharacterized and no specific treatment or biological screening panel exists. The risk for suicidal ideation and behavior is significantly increased during this time, and suicide is the leading cause of maternal death due to illness in our country. Startlingly, there have been few studies conducted to investigate the relationship of biological factors to suicidality during this vulnerable period.

Methods: We enrolled 24 women from the Mother-and-Baby program through a collaboration with Pine Rest Christian Mental Health Hospital in Grand Rapids, MI. Women completed the Edinburgh Postnatal Depression Scale (EPDS), Columbia Suicidality Severity Rating Scale, the Pittsburgh Sleep Quality Index, and a questionnaire of risk factors derived from the Maternal Risk Identifiers. A diagnostic SCID interview was performed, and a blood draw was taken at that time. Blood was then immediately transported to the laboratory on ice, centrifuged, frozen at -80°C, and later analyzed by multiplex ELISA for protein levels on a Mesoscale 6000. Partnering with our collaborators at Spectrum Health OB/GYN, clinical research nurses enrolled 60 controls in Grand Rapids, MI. The same diagnostic screenings and blood draw was performed on this cohort. Controls were defined as having an EPDS score lower than 10 and no suicidal ideations or suicide attempts.

Results: IL-2 plasma protein levels were significantly decreased in women who were in the postpartum period and exhibited suicidal ideation or suicide attempters compared to controls (Independent T-Test, $t=3.494$, $p=0.001$).

Discussion: IL-2 levels have never been reported in postpartum suicidal ideation or suicide attempters. Our laboratory has previously reported that differences in cytokine levels may distinguish suicide attempters from depressed patients, with one of these differences being lower IL-2 levels in suicide attempters. By having a better understanding of the biological mechanisms occurring during suicidal ideation and suicide attempts we hope to advance the field in the development of better screening tools and treatments for postpartum women.

T25. SIX AUTOANTIBODIES ASSOCIATED WITH AUTOIMMUNE ENCEPHALITIS ARE NOT DETECTABLE IN THE CEREBROSPINAL FLUID OF SUICIDE ATTEMPTERS

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Background: Previous findings suggest a link between neuroinflammatory processes and suicidality. Despite several lines of evidence supporting this link, including increased pro-inflammatory markers in blood, cerebrospinal fluid (CSF)- and in post-mortem brain samples from suicidal individuals, the underlying mechanisms remain poorly understood. In this pilot study, we explored the possibility that autoimmune encephalopathies might be found among suicide attempters.
Methods: We analysed the presence of six different autoantibodies (N-methyl-D-aspartate receptor, the α-amino-3-hydroxy-5-methyl-4-isoxazol-propionic acid receptor, the γ-amino-butyric acid B-receptor, the leucine-rich, glioma-inactivated 1, the contactin-associated protein-like 2, and the dipeptidyl-peptidase-like protein-6), all previously associated with psychopathology, in CSF samples from 29 unmedicated suicide attempters. Antibody detection was done using the Autoimmune Encephalitis 6 Biochip mosaics (EUROIMMUN, Lübeck, Germany) by trained laboratory personnel at a specialized diagnostic laboratory affiliated with Lund University Hospital (Wieslab, Malmö, Sweden).
Results: Five of the subjects had high CSF/serum albumin ratio, indicative of increased blood-brain-barrier permeability. However, we were not able to detect any of the six autoantibodies in the CSF samples.
Discussion: In those cases autoantibodies are detected in individuals with psychiatric and neurologic manifestations, their origin is not fully understood. Several potential mechanisms have been proposed including paraneoplastic processes, past influenza infections and genetic susceptibility Moreover, it has been hypothesized that a compromised BBB may facilitate transportation of autoantibodies from the periphery to the brain. In our sample, approximately 17% of the subjects had high CSF/serum albumin ratio, indicative of increased BBB permeability, yet CSF autoimmune antibodies were not detectable in any of these subjects. Our findings do not support the involvement of impaired BBB integrity in autoimmune processes in psychiatric patients, although larger case series are clearly needed in order to definitely refute this hypothesis.

T26. NEVER WORRY ALONE: THE VA'S INNOVATIVE NATIONAL SUICIDE RISK MANAGEMENT CONSULTATION PROGRAM

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Background: The VA National Suicide Risk Management Consultation Program provides consultation to VA providers with questions about suicide risk assessment and management. Suicide prevention experts speak with providers about assessment, conceptualization of suicide risk, evidence-based therapy and suicide prevention program-related questions. Our work is grounded in the Therapeutic Risk Management (TRM) model, which was developed by the Rocky Mountain Mental Illness Research Education Clinical Center (MIRECC). This program evaluation aims to provide descriptive and satisfaction data regarding the consultation service.

Methods: For each consultation (n=263), staff record data regarding the nature of the consultation question, descriptive information regarding the consultee (e.g., discipline) and the Veteran being consulted on. Staff also track recommendations made and resources provided. Additionally, each consultee is sent a link to a satisfaction survey to complete following the consultation.
Results: 73% of consultees were Social Workers and 72% were new users of the service. Approximately 80% of consultations were about a specific case, with the remaining consultations being related to suicide risk assessment and prevention policy. The most common characteristics of Veterans whose care was consulted on were: gender- male; service era- OEF/OIF; diagnoses- Borderline Personality Disorder. The most common recommendations made are around treatment engagement, how to gain a better understanding of the drivers of a Veteran's risk, risk stratification and documentation. Over 90% of respondents rated the consultation service as "Good" or "Excellent" in the following domains: recommendations were useful; consultant was collaborative; and, consultant was knowledgeable.
Discussion: The VA National Suicide Risk Management Consultation Program offers a unique contribution to the VA's suicide prevention program. It is utilized by both individual providers as well as VA Suicide Prevention Coordinators to enhance their suicide risk assessment and management practices. Consultees are generally highly satisfied with the program.

T27. INTERNALIZED STIGMA AND PERCEIVED BURDENSOMENESS AMONG VETERANS WITH SUICIDAL DEPRESSION

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Background: Internalized stigma and perceived burdensomeness may be important factors influencing suicidality and symptom severity among individuals with depression (Hill & Pettit, 2014; Livingston & Boyd, 2010). Internalized stigma refers to when a person absorbs negative, untrue, and stigmatizing assumptions and stereotypes about persistent mental illness and comes to believe and apply them to oneself (Drapalski et al., 2013). Internalized stigma has been found to impede the recovery process and is significantly negatively related to hopefulness, self-esteem, self-efficacy, and social functioning (Yanos et al., 2008). Yet, the relationship between internalized stigma, perceived burdensomeness, and history of suicide attempts among veterans with depression is unknown. The present study aims to explore the association of internalized stigma, perceived burdensomeness, and history of suicide attempts among persons with depression. We expect a significant positive correlation between internalized stigma and history of suicide attempts. It is also hypothesized that internalized stigma will account for variance in history of suicide attempt above and beyond what is accounted for by perceived burdensomeness.
Methods: A diagnostic interview and self-report questionnaires were used to measure internalized stigma, perceived burdensomeness, and history of suicide attempts in veterans with a diagnosis of depression. Diagnoses were assessed using the Structured Clinical Interview for DSM-IV Disorders (SCID-IV; First et al., 1995). Participants were 22 veterans from partial hospitalization and outpatient programs at a VA Medical Center, including 81.8% (n =18) males, 63.6% (n = 14) African American, 31.8% (n = 7) white, 59.1% (n = 13)

on disability, 45.5% (n = 10) divorced, and 50% (n = 11) living alone. The mean age was 52.86 (SD = 11.68, range 25-72) and average years of education was 13 (SD 1.85). Of the sample, 50% (n = 11) had attempted suicide and 9.1% (n = 2) reported he or she attempted suicide within the past 30 days. The average reported number of attempts was 1.32 (SD = 1.49). Depressive symptoms were evaluated using Patient Health Questionnaire – 9 (PHQ-9; Kroenke et al., 2001). The Suicidal Behavior Questionnaire –Revised (SBQ-R; Osman et al., 2001) was used to measure suicidal ideation, suicidal planning, and prior history of suicide attempts with higher scores indicating more severe suicidal behavior. Internalized stigma was evaluated using the Internalized Stigma of Mental Illness Scale (ISMI; Ritscher et al., 2003) and perceived burdensomeness was measured using the Perceived Burdensomeness Scale (PBS; Peak et al., 2015).

Results: Preliminary correlations suggest a non-significant positive trend toward a relationship between internalized stigma and number of lifetime suicide attempts (r = .231 p = ns). Results suggest higher levels of internalized stigma were associated with higher levels of suicide related behavior as assessed by the SBQ-R (r = .434 p = .05). The ISMI was significantly positively related to depressive symptoms (r = .494 p = .05) as assessed by the PHQ-9 and perceived burdensomeness (r = .786 p = .01). Data from additional participants will be scored and analyzed soon. Multivariate analyses will be conducted once there is sufficient statistical power to detect significant effects.

Discussion: Preliminary analysis suggests internalized stigma is likely associated with higher levels of perceived burdensomeness and suicide related behaviors among veterans with depression. Results of this study may further our understanding of the role that internalized stigma plays in suicidality and better inform effective prevention and treatment programs.

T28. THE INTERACTION OF NONSUICIDAL SELF-INJURY AND BODY DISSATISFACTION IN THE PREDICTION OF SUICIDE IDEATION IN ADOLESCENTS

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Background: Nonsuicidal self-injury (NSSI) has high prevalence rates among non-clinical adolescents (average 20%), as does body dissatisfaction; both of which have shown strong associations to suicidality. Orbach (1996) initially proposed that attitudes toward the body and investment in protecting the body from harm are important in understanding NSSI and suicide; however, body dissatisfaction is studied less frequently than other risk factors. Suicidal adolescents report more body dissatisfaction, which is also predictive of suicidal ideation beyond depression and hopelessness. While body dissatisfaction is known to be related to both NSSI and suicide ideation, it is unclear how NSSI and body dissatisfaction may interact in their association with suicide ideation, particularly in adolescents who typically report high levels of both. It's possible that NSSI behavior affects habituation to self-harm and pain, which when paired with strong body dissatisfaction may increase suicide desire and capability. It was hypothesized that body dissatisfaction would moderate the relationship between NSSI and suicide ideation, such that the relationship would be strengthened when body dissatisfaction was high. It was also hypothesized that among adolescents with NSSI history, body dissatisfaction would moderate the relationship between NSSI severity (# of NSSI methods) and suicide ideation.

Methods: Data were collected from 436 non-clinical adolescents from 7th and 9th grades (mean age=13). The sample was about half female (52%) and the majority was white (84%).

Close to 30% of the sample reported a lifetime history of NSSI. Adolescents completed self-report questionnaires at their schools which included measures assessing body satisfaction (Eating Disorder Inventory-3; EDI-3), suicide ideation (Suicide Ideation Questionnaire-JR; SIQ-JR), and NSSI behavior (Inventory of Statements about Self-Injury).
Results: Moderation hypotheses were tested using the Process macros for SPSS (Hayes, 2013). NSSI was entered as a dichotomous independent variable (yes/no for history of NSSI), the body dissatisfaction subscale from the EDI-3 was entered as the moderator, and the SIQ-JR total score was entered as the outcome variable. For the whole sample, the overall model was significant (R^2=.33), body dissatisfaction and NSSI were significant positive predictors of suicide ideation, and the interaction was significant. Simple effects testing indicated that at both high and low levels of body dissatisfaction, having NSSI history was associated with higher suicide ideation scores. However, the association between NSSI and suicide ideation was stronger and more pronounced when body dissatisfaction was high. In the subsample of adolescents with NSSI history, moderation analyses were run again using # of NSSI methods as the independent variable (NSSI severity). The overall model was significant (R^2=.28), as was the interaction. Simple effects testing indicated that the association between NSSI severity and suicide ideation was only significant at high levels of body dissatisfaction.
Discussion: In line with previous research, both body dissatisfaction and NSSI behavior were significantly associated with suicide ideation in non-clinical adolescents. For both the whole sample and the subsample of adolescents with NSSI, intensity of body dissatisfaction moderated the association between NSSI and suicide ideation. Results indicate that the combination of NSSI behavior and strong body dissatisfaction may increase the risk for thoughts of suicide, and again point to the salience of feelings and regard for the body in the spectrum of self-harm behavior.

T29. INVESTIGATION OF THE SUICIDE NARRATIVE AND THE SUICIDE CRISIS SYNDROME AS NEAR-TERM RISK FACTORS FOR SUICIDAL BEHAVIOR

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Background: Despite many years of research into the risk factors for suicide, suicide remains one of the leading causes of death worldwide. As our group and other researchers have noted, typical investigations into the predictors of suicide risk tend to focus on individual risk factors in isolation rather than in relation with one another. Additionally, most identified suicide risk factors are predictive of chronic but not acute suicide risk. In the interests of developing a comprehensive and integrated model of the progression of suicide risk over time, we investigated the interrelationships of multiple previously identified psychological risk factors and then tested whether their association with suicide risk was mediated by a specific negative affect state previously associated with acute suicide risk, which we have termed the suicide crisis syndrome. To ensure that our model was relevant to acute suicidal risk, we tested the model against recent (past month) suicidal phenomena.
Methods: Subjects included 237 psychiatric outpatients who completed a battery of psychological measures, including the Columbia Suicide Severity Rating Scale (CSSRS), the Suicide Crisis Narrative (SCN) and the Suicide Crisis Inventory (SCI). The Suicide Crisis Narrative is a measure of a hypothesized suicidal narrative, in which the suicidal individual constructs a narrative of self and other sufficiently distressing that suicide becomes a viable

option. The SCN was drawn from multiple published instruments that assess psychological risk factors for suicide, including thwarted belongingness perceived burdensomeness, social defeat, humiliation, and the failure to disengage from unattainable goals. The SCI assesses the suicide crisis syndrome. In the first step, a principal component analysis (PCA) was conducted on the different subscales of the SCN to test the underlying factor structure. Resulting principal components were then entered as independent variables (IV) into a mediation analysis with the SCI as the mediating variable (MV) and recent suicidal phenomena (a continuous variable incorporating suicidal ideation and behavior) as the dependent variable (DV).

Results: The PCA with varimax rotation yielded 2 factors with eigenvalue > 1. The first factor, labelled Interpersonal, accounted for 48.2% of the variance and was dominate by the subscales of Defeat, Belongingness, Humiliation and Burdensomeness, with factor loadings ranging from .722-.920. The second factor, labelled Goal Orientation, accounted for 23.9% of the variance and was dominated by the subscales of (Impaired) Goal Disengagement and Re-engagement, with factor loadings ranging from .754-.804. Humiliation loaded on both factors, at .722 and .426, respectively. In a path analysis in which both factors were entered as the IV, the SCI total score as the MV, and recent (past month) suicidal phenomena as the DV, the Goal Orientation factor was not significantly related to any of the other variables. There was, however, a significant total effect ($p=.024$), direct effect ($p=.026$) and indirect effect ($p<.001$) of the Interpersonal factor on past month suicidal behavior, suggesting that the suicide crisis syndrome acts as a partial mediator of the effect of the Interpersonal factor on recent suicidal ideation and/or behavior.

Discussion: These data provide preliminary evidence of a multi-stage, integrated model of the pathway to suicidal behavior, in which a suicidal narrative, incorporating multiple disturbances of self and interpersonal representations, is associated with activation of the suicide crisis syndrome, an acute negative affect state, which in turn is associated with elevated suicidal ideation and/or behavior in the near term.

T30. SUPPORTING EVIDENCE INFORMED DECISION MAKING: AGENT BASED MODELLING FOR SUICIDE PREVENTION

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Background: Suicide-related behaviours emerge from a dynamic system of complex multiple interacting factors. Policy approaches to suicide prevention need to address risk and protective factors at multiple levels (intrapersonal, interpersonal, family, community, structural/societal) through multifaceted interventions. Agent based models simulate a hypothetic "world" where interactions of synthetic "individuals" with one another and their environments over time generate outcomes. Agent based models can be used to test various "what if" scenarios to inform policy decisions, especially in complex systems where it is difficult to predict the joint effect of multiple, simultaneous interventions. This is a novel application of a computational approach that has the potential to improve decision making and resource allocation in the absence of more traditional forms of evidence.

Methods: This abstract presents the results from the first stages of the development of an agent based model to support suicide prevention decision making, including the development of a conceptual framework and a participatory model building process. One scoping review on conceptual models of suicide and a second scoping review on suicide prevention

interventions were conducted to serve as the basis for model building sessions. Data from the two reviews were coded and themes were generated.
Results: A scoping review on conceptual models of suicide identified a large number of models and component concepts. Most conceptual models of suicide were either intrapersonal, person/environment or described within a socioecological framework. Because the types of interventions used a public health approach to suicide prevention often include a number of ecological levels, a socioecological model was chosen as an organizing structure, within which intrapersonal and person/environment models could be nested. Suicide prevention interventions were identified, with many at the individual level as well as a more limited number at the family, community and structural/societal level. Interventions were also classified as primary, secondary or tertiary prevention. Interventions from the second scoping review were mapped to related concepts from the first review (e.g. mental illness as a risk factor for suicide was mapped to "early detection and treatment of depression" as an intervention). These models, concepts and interventions formed a menu of choices on which a participatory model building process was developed. This model building process will be implemented through a series of workshops with key stakeholders in suicide prevention, which will then be used to implement an agent based model.
Discussion: This project is a novel approach in Canada for simulating different options for suicide prevention. It demonstrates the potential value of bringing together diverse disciplines and methodologies to generate the best available evidence to inform programs and policies. Next steps include conducting model building workshops and developing the agent based model in an iterative manner.

T31. WHAT DO WE KNOW ABOUT SUICIDE: A META-ANALYSIS

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Background: Suicide is a leading cause of death worldwide, and is global epidemic that kills one million people every year (CDC, 2013). In the United States alone, 40,000 Americans die by suicide every year. In fact, more people die by suicide than by homicide, AIDS, car accidents, and war (CDC, 2014; WHO, 2012). In order to understand this public health crisis and curb the number of suicide deaths, researchers have put forth several theories to guide their work. Additionally, in recent years, complex theories of suicide have emerged in the literature, relying heavily on artificial intelligence. However, to date, there have been no publications summarizing and testing common traditional theories of suicide. Furthermore, there have been no publications comparing traditional theories of suicide behaviors to the cutting edge methods of artificial intelligence.
Methods: In the present meta-analysis, biological (Oquendo et al., 2014), emotion dysregulation (Linehan, 1987), interpersonal (Van Orden et al., 2010), and hopelessness (Beck, 1975) theories of suicide were studied and compared to the efficacy of artificial intelligence. For this meta-analysis we prioritized the collection of causal data, followed by longitudinal data, and finally correlational data. Given that there was very little causal data, longitudinal data made up most of the cases for the four traditional theories. There was additional emphasis put on available cross sectional evidence for the Interpersonal Theory of Suicide due to the paucity of longitudinal data on this theory.
In its entirety, 779 unique statistical cases from 258 studies were included, from an initial 2868 that were searched. There were 53 longitudinal prediction cases testing Hopelessness Theory; 507 cross sectional and longitudinal cases testing the Interpersonal Theory of

Suicide; 139 longitudinal cases for biological approaches; and 84 longitudinal cases for constructs related to emotion dysregulation.

Results: Statistical cases relating specifically to the interpersonal theory were comprised mostly of cross sectional data, and produced a weighted average of $r = .27$ ($p < .001$) after adjusting for publication bias. Longitudinal data from this and all other theoretical approaches produced a weighted average of $r = .07$ ($p < .001$) after adjusting for publication bias, with no particular theoretical approach deviating significantly from this overall figure. These weighted effect sizes, particularly the more consequential weighted longitudinal effect size, are small in magnitude.

Discussion: Surprisingly the findings from this meta-analysis suggest these major, traditional theories of suicidal behavior are not strongly related to suicidal outcomes. This comes as surprise given that there have been years of research and hundreds of studies investigating these theories and suicide outcomes. The implications from this meta-analysis suggest that the field of suicidology may need to re-examine some of the guiding assumptions.

While artificial intelligence has predicted suicidal behaviors over both the short term and the long term at AUC's of .85 (Ribeiro et al, 2016), meta-analytic work is still needed to evaluate the aggregate effect of all relevant articles. Currently, data collection is underway collecting all published works that employ artificial intelligence in predicting suicidal behaviors. Subsequent analyses will be performed to compare artificial intelligence to traditional theoretical approaches predicting suicidal behaviors.

Analyses from this final step of data collection will answer this question: with artificial intelligence, can the field of suicidology predict suicidal behaviors with an accuracy exceeding traditional methods?

T32. ASSOCIATION BETWEEN LEVEL OF ALCOHOL AND MARIJUANA USE AND SUICIDE IDEATION SEVERITY AND ATTEMPT FREQUENCY AMONG ADOLESCENTS PRIOR TO INPATIENT PSYCHIATRIC HOSPITALIZATION

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Background: Alcohol use elevates risk for suicide attempts among adolescents, and there is mixed evidence for marijuana use as a risk factor for suicide. In addition, the nuanced relationship between suicide ideation, attempts, and varying levels of alcohol and marijuana use among adolescents is not well understood. Arguably, the population with greatest acuity of these behaviors, and thus greatest risk for suicide death, are adolescents who are psychiatrically hospitalized following a suicidal event and endorse any alcohol use. This study examines whether the severity of suicide ideation and number of attempts three months prior to inpatient psychiatric hospitalization differed among adolescents with varying levels of alcohol and marijuana use.

Methods: Participants were recruited from an inpatient psychiatric unit in the northeastern US. This study included 41 adolescents (80.95% female; Mage=15.69) hospitalized following a suicide plan or attempt who endorsed past month alcohol use. Suicide ideation severity was measured using the Suicide Ideation Questionnaire (SIQ), and past 90-day marijuana use, alcohol use, marijuana quantity, alcohol quantity, and number of suicide attempts were measured using the Timeline Follow Back Calendar (TLFB). Marijuana quantity (M=33.89,

SD=80.19), alcohol quantity (M=35.82, SD=47.42), and suicide attempts (M= 2.58, SD=10.16; No Attempts=26.8%, One or more attempts=73.2%) were analyzed as continuous variables encompassing the total amount of alcohol consumed, total days marijuana was used, and total number of suicide attempts made in the previous 90 days. Groups for alcohol use were divided into low-moderate (1-3 days, n=15) and heavy (4-90 days, n=26). Groups for marijuana use were divided into no (0 days, n=9), low-moderate (1-14 days, n=24), or heavy (15-90 days, n=8). One-way between subjects ANOVAs were conducted to compare the effects alcohol and marijuana on baseline SIQ scores and suicide attempt totals.

Results: No effects of alcohol use on SIQ scores for adolescents with low-moderate or heavy alcohol use were found [F(31.38, 6.67)=0.83, p=0.67]. There was a statistically significant effect of marijuana use on SIQ scores for the three conditions [F (34,6)=5.81, p<.05]. Post-hoc comparisons using the Tukey HSD test indicated the mean score for no marijuana use (M=88.78, SD=41.11) was significantly lower than low-moderate (M=100.08, SD=38.57) and heavy (M=119.13, SD=33.89). The low-moderate marijuana use group did not statistically significantly differ from the heavy group. Spearman's correlations showed a statistically significant relationship between past 90-day quantity of alcohol use and past 90-day suicide attempt frequency (rs=0.32, p<.05). However, the relationship between past 90-day quantity of marijuana use was not related with past 90-day suicide attempt frequency.

Discussion: Findings suggest that for adolescents psychiatrically hospitalized for a suicidal event who drink, more frequent marijuana use is associated with more severe suicide ideation. In addition, more frequent alcohol use is associated with increased risk for suicide attempts, but not suicide ideation severity. Given the significant role alcohol plays in subsequent suicide-related behaviors, and that alcohol and marijuana use commonly co-occur, there is a need to develop and test integrated alcohol, marijuana, and suicide interventions during inpatient psychiatric hospitalization for adolescents.

T33. GENDER AND SEXUAL ORIENTATION DIFFERENCES IN MOTIVATIONS FOR SUICIDE BETWEEN IDEATORS AND ATTEMPTERS

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Background: Research has identified a large number of risk factors for suicide, however results from epidemiological studies suggest that suicide rates have remained largely unchanged. One possible explanation for this disparity might be the lack of knowledge about differences between suicide attempters and suicide ideators who do not attempt—an important distinction given that most people who think about suicide do not act on their thoughts. To further clarify this distinction, we compared motivations for suicide in two groups: individuals with suicide attempts vs. individuals with suicide ideation but no suicide attempts. Because suicidality varies across different demographics, we considered whether any attempter-ideator differences vary by gender or sexual orientation.

Methods: Two large samples of participants living in the U.S. were recruited online for the study. One sample consisted of individuals with a history of suicide ideation but no history of attempts (ideators; n = 409, M age = 31.1, SD = 10.3, 49% female, 79% heterosexual), and the other consisted of individuals with a history of suicide attempts (attempters; n = 222, M age = 30.2, SD = 9.0, 56% female, 67% heterosexual).

Motivations for suicide among attempters were assessed with the Inventory of Motivations for Suicide Attempts (IMSA), a self-report measure of 10 different potential motivations for suicide. The 10 motivations are well-characterized by two superordinate factors: internal

motivations and communication motivations. Previously published research supports the reliability and validity of the motivations scales in both adult and adolescent clinical samples. A parallel version of the IMSA was lightly edited to assess motivations for suicide among ideators (referred to as the IMSI).

Results: Overall, motivations were more strongly endorsed by attempters compared to ideators with several exceptions, in which endorsement was similar between attempters and ideators. Weak to moderate effect size differences (d range = 0.02 – 0.60) were obtained comparing male ideator and attempter groups, weak to large effect size differences (d range = 0.03 – 0.84) were obtained comparing female ideator and attempter groups, weak to moderate effect size differences (d range = 0.02 – 0.69) were obtained comparing heterosexual ideator and attempter groups, and weak to large effect size differences (d range = 0.02 – 0.77) were obtained comparing sexual minority ideator and attempter groups. No statistically significant differences were obtained comparing effect size difference across either gender or sexual orientation. In the total sample, the smallest effect size differences between ideators and attempters were found on Hopelessness (d = 0.09), Low Belongingness (d = 0.07), and Problem Solving (d = 0.02) scales, and the largest effect size differences between ideators and attempters were found on Fearlessness (d = 0.72), Impulsivity (d = 0.36), and Burdensomeness (d = 0.31) scales.

Discussion: Our study found that attempters more strongly endorsed most motivations measured compared to ideators. However, the magnitude of this pattern ranged from negligible to large for different motivations. Fearlessness in particular was notably different in attempters, suggesting a more pertinent role for reduced fear of death in motivating suicide attempts compared to suicide ideation. This large difference observed in fearlessness between ideators and attempters aligns with recent theories of suicide, which stress the role of capability in the transition from ideation to attempt. The overall pattern of results was similar across both gender and sexual orientation. The current study is limited by its cross-sectional design and retrospective nature of reporting motivations for suicide.

T34. (HOW) DOES SUICIDAL IDEATION FLUCTUATE? AN INVESTIGATION IN PSYCHIATRIC INPATIENTS WITH DEPRESSION USING ECOLOGICAL MOMENTARY ASSESSMENT

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Background: The fluctuating nature of suicidal ideation (SI) has been described previously, but longitudinal studies investigating the dynamics of SI are scarce. Our aim is to investigate the fluctuation of SI in an inpatient sample using a smartphone-based fine grained real-time approach via ecological momentary assessment (EMA). Furthermore, we aim at testing the acceptance of a high-frequency EMA in psychiatric inpatients.

Methods: Sixty-five inpatients with unipolar depression and current and/or lifetime SI rated their momentary SI 10 times per day over a 6-day-period. To quantify variability, two statistics were used: Intra-class correlation (ICC) as an indicator of the proportion of between-person and within-person variability of a variable's variance and mean squared successive difference (MSSD) as an indicator of point-to-point variability (within-subjects).

Correlations of MSSD with severity of depression, number of previous depressive episodes and history of suicidal behavior were computed to examine associations of SI fluctuation with psychopathological parameters.
Results: All participants completed at least 75% of all assessments for the entire sampling period of 60 measurement points (M=89.3%, SD=7.1). MSSD values ranged from 0.0 to 23.2 (M=4.8, SD=5.7). ICC was 0.72, showing that about 30% of the variability in SI is due to within-person variance. When controlling for overall amount of SI across all measurement points, no significant correlations of MSSD with parameters of depression and suicidality could be found. Individual trajectories of SI are presented exemplary to illustrate the diversity in fluctuation.
Discussion: Our study suggests high acceptance and compliance of EMA with high sampling frequency for collecting data on suicidality in psychiatric inpatients. Furthermore, it demonstrates that real-time assessments via EMA are capable to capture the dynamics of SI. We found a considerable diversity in the trajectories of SI in depressive inpatients. A relevant proportion of participants showed a high degree of variability in SI over the short period of 6 days, implying the need of assessing SI repeatedly in short time frames to avoid missing important fluctuations. As there is no direct association between MSSD with psychopathological parameters, it remains unclear which variables are associated with the fluctuation of SI or predict changes in SI. In addition, we have not assessed whether and how the fluctuation of SI is connected with other aspects of suicidal behavior (e.g. suicidal plans or actions). Further research using EMA and sophisticated analyses with larger samples is necessary to clarify these issues.

T35. THE PRIMING EFFECTS OF GUN ON SUICIDAL COGNITION

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Background: The suicide rate has been increasing in the United States in the past decade, with over 42,000 suicide deaths in 2014 (CDC). Evidence from naturalistic studies suggested that the wide accessibility of guns might have contributed to the rising suicide rate (Miller & Hemenway, 2008; Anestis et al., 2015). In addition, experimental studies from social psychology indicated that the presence of gun increases aggressive thoughts through automatic priming (Anderson, Benjamin, & Bartholow, 1998; Bartholow et al., 2005). However, it remains unclear whether there is a direct priming effect of gun on suicide. As such, this study aims to examine whether shooting oneself with a gun increases implicit suicidal cognition by using virtual reality (VR) equipment.
Methods: All study procedures were approved by the Institutional Review Board at Florida State University. A total of 24 undergraduate students participated in the study for course credits. Participants were randomly assigned to experience a neutral introductory scenario of VR (control condition), or be positioned in a virtual room with a gun on the floor (experimental condition). Participants in the experimental condition were instructed to first pick up the gun and then shoot themselves virtually. After each condition, participants completed a battery of questionnaires.
Results: Participants were predominantly female (75.0%) with representation from multiple races and ethnicities (White: 50.0%; Black; 16.7%; Asian: 8.3%; Hispanic: 20.8%). Participants in the experimental condition reported feeling more distressed ($p = .001$), upset ($p = .002$), scared ($p = .001$), ashamed ($p = .04$), nervous ($p = .002$), and jittery (($p = .02$) during the VR scenario than participants in the control condition. The two groups, however,

reported similar levels of implicit suicidal cognition as measured by Suicide Word Completion Task (Hayes, Schimel, Arndt, & Faucher, 2010). We note that this study is ongoing, and data on multiple measures of suicidal cognition from a larger sample (n = 50) will be available for presentation at the conference in November.

Discussion: Findings from this study suggest that shooting oneself with a gun virtually elicited affects consistent with a suicide attempt (e.g., distress, fear, physical arousal), but did not increase individuals' accessibility of suicidal thoughts. These results should be considered preliminary due to several limitations in the study. First, virtual reality has the advantage of providing an immersive environment that seems real to the participants, but individuals might still behave differently in VR environment than in real life. Therefore, our simulation of a suicide attempt should not be considered equivalent to an actual attempt. Second, the demand effect of participating in a study might have altered participants' decision to shoot themselves. We originally anticipated that some participants would choose not to shoot themselves, but all participants agreed to do so in the study. Third, only one measure was used to assess suicidal cognition in a small sample. To address the last two limitations before the conference presentation, we will recruit a larger sample of participants, adopt multiple measures of suicidal cognition (e.g., Implicit-Association Test [Nock et al., 2010]; Affective Misattribution Procedure [Payne & Lundberg, 2014]), and modify study instructions to decrease the demand effect.

T36. RISK FACTORS PROXIMATE TO DEATH BY SUICIDE AND RISK ASSESSMENT IN THE CONTEXT OF DENIED SUICIDE IDEATION

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Background: Health care providers have significant opportunities to identify individuals at near-term risk for suicide, but lack empirical data on near-term risk factors. Only two studies have been published to date with death by suicide as an outcome and risk factors studied were within the last 30 days of life. The assessment of near-term suicide risk begins and often rests on the ascertainment of suicide ideation (SI) in spite of the fact that expressed SI has only weak evidence as a predictor of near-term death by suicide. An average of about 75% of patients who died by suicide denied having SI when last asked prior to their deaths. This study aimed to identify dynamic, state-related risk factors observed by clinical practitioners within the last 30 days of life of patients who died by suicide and to compare these near-term risk factors among patients who denied versus responded positively to having suicide ideation (SI) when last asked by a clinical practitioner prior to their death.

Methods: This retrospective chart review study was approved by the institutional review board of the Johns Hopkins School of Medicine. A convenience sample of clinical charts for patients who died by suicide within 30 days of their last evaluation by a clinical provider were systematically reviewed and abstracted.

Results: A total of 157 cases met inclusion criteria. Twenty-five decedents (16%) died while inpatients; 25 (16%) had recently been discharged from inpatient care (80% within 1 week; 32% within 24 hours of their death); 16 (10%) were ED admissions; and 91 (58%) were in outpatient care at the time of their suicide. Almost three-fourths (73%) and one-half (49%) of these decedents had been evaluated within 7 and 2 days, respectively, of their deaths.

Risk factors charted for the majority of all decedents were: a history of prior suicide ideation and/or suicide attempt, current anxiety/agitation and sleep problems, current interpersonal problems or job/financial strain, current comorbid diagnoses, current social

isolation/withdrawal, and a family history of mental disorder. Two-thirds of patients denied having SI when last asked and one-half of these patients were dead by suicide within two days. Decedents who denied having SI were quite similar in charted diagnoses, symptoms, behaviors and environmental circumstances to decedents who responded affirmatively to having SI.

Discussion: Given the paucity of empirical studies of near-term suicide risk and the episodic and variable nature of many of these risk variables, this study's time frame of the last 30 days of life adds to the scant existing literature on near-term risk that may well yet lead to improved clinical decision-making. Clinically significant findings in the present study include: (a) a prudent suicide risk assessment must go well beyond questions about SI, (b) a denial of SI is insufficient to formulate no or low risk, (c) some combination of frequently observed risk factors, such as those found to be present in roughly 50% or more of this sample, might comprise a reasonable set of observations to define acute risk. Such a profile might have high sensitivity, but low specificity; however, the link to targeted interventions in cases with such a profile would serve to be reasonable for both true and false positives.

T37. REVIEWING THE POLICY FRAMEWORK FOR SUICIDE PREVENTION: WHAT ARE THE LEVERS?

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Background: Suicide prevention has traditionally been positioned within the health sector, with few exceptions. With evidence that many of the determinants of suicidal behaviour sit outside of the health sector, there is a need to view policy more broadly in order to identify the full range of determinants of suicide and their associated policy areas. This may provide opportunities for advocacy across a number of policy areas.

Methods: A review of policies impacting on suicide outcomes will be conducted. The review will include epidemiological, clinical, and population level research where the outcome is suicides or suicide attempts. Results will be presented across the range of possible policy levers in terms of the strength and breadth of the evidence.

Results: The review was beginning at the time of writing. Emerging areas of interest are alcohol policy, justice and law enforcement policies, employment and unemployment support policies, refugee policy, means restriction and pharmacovigilence policies. This paper will present results of the full review.

Discussion: Public policy is an area of emerging interest for suicide prevention, beyond the health policies within which suicide prevention normally sits. Understanding the public policy framework and its influence on suicide prevention provides an opportunity for researchers and advocates to influence the agenda in favour of improved suicide prevention.

T38. SUICIDE RISK IN YOUTH WITH AUTISM SPECTRUM DISORDER: PREVALENCE AND CLINICAL CORRELATES IN AN INPATIENT PSYCHIATRIC SAMPLE

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Background: Suicide is an international public health crisis and the second leading cause of death for youth aged 10 to 24 years. While individuals with a variety of psychiatric diagnoses are at heightened risk for suicide, recent studies suggest that youth with Autism Spectrum Disorder (ASD) are at elevated risk. Several factors may contribute to this increased risk, including co-morbid psychiatric disorders and social challenges. Yet there is a dearth of research on suicide risk in youth with ASD. An understanding of how suicidal thoughts and behaviors develop, are expressed and can be reliably detected in youth with ASD is critical for reducing morbidity and mortality in this population. While there have been recent advances in the development and validation of suicide risk measures for typically developing youth in medical settings, there are no suicide risk screening instruments designed or validated specifically for the ASD population. The aim of this study is to determine a prevalence estimate of thoughts of death or suicide in youth with ASD.
Methods: Data were collected from a convenience sample of youth with ASD aged 4-20 years hospitalized for psychiatric reasons as part of a large, multisite study (The Autism Inpatient Collection). A single parent reported item, the only indicator that included suicidal thoughts in the multi-measure study, was used to estimate the prevalence of thoughts of death or suicide. This item, from the Child and Adolescent Symptom Inventory-5 (CASI-5;), asked the parent whether the youth "has periods lasting at least several days where he/she…talks about death or suicide." Individual characteristics associated with talking about suicide or death, such as intellectual ability and co-morbid psychiatric diagnoses, were also assessed.
Results: A total of 107 verbal youth with ASD met inclusion criteria and were included in this sub-analysis of the larger study (77% male; 91% White; mean age 13.6 ± 2.3 years; mean nonverbal IQ 95.5 6 ± 20.6). Per parent report, 22% of youth with ASD had periods lasting several days when they talked about death or suicide "often," or "very often." Clinical correlates included the presence of a comorbid mood (OR=2.71, 95% CI 1.12-6.55) or anxiety disorder (OR = 2.32, 95% CI 1.10-4.93). Demographic factors, including nonverbal IQ, sex, race and age, did not play a role in the frequency of talking about death or suicide in this sample.
Discussion: This sub-analysis reveals that nearly a quarter of verbal youth with ASD hospitalized in an inpatient psychiatric unit reportedly talked about death or suicide for periods lasting several days. Participants with an anxiety disorder or comorbid mood disorder were more than twice as likely to have a parent report that they talked often or very often about death or suicide. It is critical to consider these findings in the context of the Joint Commission's recommendation to screen all patients for suicide risk in all medical settings. The pediatric ASD population presents unique challenges for the medical system as differences in the cognitive ability, social communication, restricted interests, language and abstract reasoning generally seen in youth with ASD have limited the amount and validity of suicide risk screening currently performed. These results demonstrate a need to develop and validate suicide screening instruments designed specifically to identify risk in ASD populations. Such instruments will be necessary to ensure that no one at risk for suicide goes undetected.

T39. EVALUATION OF A SUICIDE RISK SCREENING AND ASSESSMENT TRAINING WEBINAR FOR PRIMARY CARE PROVIDERS

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Background: Individuals in rural communities are at disproportionately high risk for suicide. Because of the high levels of stigma surrounding mental health, lack of behavioral health resources, and concerns about confidentiality in rural areas, individuals are more likely to visit a primary care professional for behavioral health issues, such as suicide, than a behavioral health provider. However, many primary care providers report insufficient knowledge and training regarding suicide screening and risk assessment. Additionally, many rural providers lack access to high quality trainings because of geographic isolation and a lack of resources. Online training delivery methods have the advantage of reaching geographically remote populations and are an under-utilized intervention in suicide risk assessment training. In order to address this gap, the present study examined the acceptability and effectiveness of a brief, online training webinar targeted towards primary care providers and their ancillary staff that focused on suicide risk screening, assessment of suicidal patients, and safety planning.

Methods: A one-hour interactive training webinar entitled, "Suicide Screening and Assessment in Primary Care" was delivered through a synchronous, online format to a group of primary care providers and their staff. The webinar reviewed guidelines for how and when to screen for suicide risk, risk factors and warning signs for suicide, how to complete a risk assessment with a patient who screens positive for suicide risk, and how to complete an individualized safety plan with a suicidal patient. The webinar included didactic material and two interactive exercises in which participants were asked to review and discuss case vignettes involving suicidal individuals. A sample of participants who attended the webinar (n = 22) completed post-test surveys asking them to rate knowledge gains and give feedback on the acceptability of the webinar.

Results: After the webinar, the majority of the respondents reported feeling confident in their ability to ask patients about suicide (81.8%), that they were comfortable asking patients about suicide (77.3%), that they had adequate knowledge about the risk factors (86.4%) and warning signs (77.2%) for suicide, and in their ability to complete a safety plan with a suicidal individual (68.2%). Additionally, 76.2% reported that the webinar was relevant to their practice and 81.9% reported they would recommend it to a fellow medical professional.

Discussion: This study gives preliminary evidence for the effectiveness of a brief, online training on suicide risk screening, assessment, and safety planning for primary care. Given the high patient loads, time constraints, and geographic isolation that many rural primary care practices face, online trainings have the potential to reach providers that may otherwise be unable to access more traditional in-person continuing education opportunities. The fact that a brief, online training on suicide risk screening and assessment is effective and welcomed is highly encouraging, as this format has the potential to disseminate essential knowledge to providers in remote locations. Future research should examine the effectiveness of synchronous and asynchronous methods of webinar delivery, as asynchronous methods may be able to even better accommodate primary care providers' busy schedules and multiple demands.

T40. SUICIDE SCREENING IN RURAL PRIMARY CARE: THE REPORTS OF WEST VIRGINIA PRIMARY CARE PROVIDERS

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Background: Suicide is a significant public health problem in the U.S. and rural communities have disproportionately high rates of suicide. Primary care physicians are uniquely positioned to address suicide in these areas, as the majority of individuals who die from suicide have seen a primary care physician in the year and months prior to their death. Universal suicide risk screening can increase suicide detection rates, behavioral health referral rates, and decrease acute care utilization. However, only between 11-36% of primary care physicians routinely screen for suicide risk in their patients. The overall goal of the present study was to gather evidence to help inform future implementation of universal suicide risk screening protocols in rural primary care practices. Specifically, this study describes suicide risk screening practices in West Virginia primary care, providers' opinions of the utility of universal suicide risk screening, barriers that impede suicide risk screening, and interventions that would facilitate the process.

Methods: In-depth, semi-structured interviews were conducted with a sample of primary care providers (n = 15) whose practices were located throughout the state of West Virginia. Respondents were recruited by the West Virginia Practice Based Research Network (WVPBRN) and the principal investigator. The sample was 100% White, 53% male, and the majority (73%) were Doctors of Medicine (MDs). Interviews were tape-recorded and transcribed verbatim and then coded thematically by a team of three coders using a consensus coding methodology.

Results: Only 4 out of the 15 providers (27%) reported that they conducted universal suicide risk screening with their patients. 53% (n = 8) reported that they screened for suicide risk only based on warning signs, such as depression, anxiety or other mood disorders. 40% of the providers (n = 6) reported that they completed universal depression screening, with follow-up questions about suicide only for those patients who screened positive for depression. While the majority of providers reported that universal suicide risk screening was a useful practice, providers also felt that more resources were needed to make this feasible in primary care. Multiple barriers to screening were reported including: lack of time/disruptions to clinic flow, high patient loads, lack of training in regards to suicide assessment and follow-up, lack of mental health and crisis support resources, cultural beliefs specific to Appalachia, and having multiple screening burdens in primary care. Favorable interventions suggested by providers included: standardized and streamlined protocols for suicide risk screening and follow-up, access to co-located behavioral health services, the use of technology for screening, integrating screening for medical and mental health issues, utilizing a team approach, and training.

Discussion: Primary care providers are motivated to address suicidal thoughts and behaviors through preventative patient screening, but lack the resources to do so effectively. Having streamlined, brief tools and follow-up protocols would make this process more feasible and effective. Future research should focus on developing brief, integrated suicide risk screening and follow-up protocols, integrating technology into screening methods, and examining the efficacy of having co-located behavioral health resources available for primary care practitioners.

T41. IMPACT OF SUICIDE STIGMA ON INTENT TO PREVENT SUICIDE

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Background: A 2013 study of suicide stigma denoted significant links between suicide stigma and poorer knowledge of suicide prevention (Batterham, Calear, & Christensen, 2013). To date, few studies have examined direct links between suicide stigma in adults from the United States of America intent to prevent suicide (USA). This proposal will examine attitudes of adults toward suicide and assess their impact on intentions to prevent suicide (i.e. knowledge of suicide warning signs; willingness to engage in response to warning signs; intent to ask about suicide risk; referring person to a prevention resource)
Methods: 157 participants between 18-75 years completed the Stigma of Suicide Scale-Short Form (Batterham, Calear, & Christensen, 2013); the Literacy of Suicide Scale-Short Form (Calear, Batterham, & Christensen, 2012); the Gatekeeper Survey (Wyman et al., 2008); the exposure to suicide scale (Batterham, Calear, & Christensen, 2013); and the 9-item patient health questionnaire (Kroenke, Spitzer, & Williams, 2001) through an online survey.
Results: With the use of Wilks's criteria, the combined DVs (intent to prevent suicide) were significantly affected by suicide stigma [$F(112,487) = 1.55$, $p < .01$; Wilk's $\Lambda = 0.29$, partial $\eta 2 = .26$].
Discussion: Results indicate those holding contempt toward person's contemplating suicide were less willing to engage with them. This finding suggests stigma toward suicide negatively impacts an individual's willingness to prevent a suicide when warning signs are present. This research provides important insights into community based support, and the need for public education to reduce stigma toward person's in acute mental health crises.

T42. AN ANALYSIS OF THE QUALITY OF SUICIDE REPORTING IN SRI LANKAN NEWSPAPERS

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Background: Suicide and self-harm is a global public health problem, also in a middle-income country as Sri Lanka. Irresponsible reporting may increase imitative suicidal behavior whereas responsible reporting can have a preventive effect, raise political awareness and inform public opinion. The aim of this study was to examine the quality of reporting on self-harm and suicide in Sri Lankan printed newspapers and to compare the quality of reporting between Sinhala and English newspapers.
Methods: In total, 407 newspapers were screened (from 1 December 2014 to 31 January 2015) and 81 articles included in the study (47 Sinhala and 34 English). Articles were included when the topic was on a specific episode of self-harm or suicide and when the text made the reader believe the reported episode could be a case of self-harm or suicide. Tamil newspapers were not included. The quality of the articles was measured using the PRINTQUAL tool.
Results: Generally, the English articles complied better to guidelines than the Sinhala articles.
Indicators of non-compliance to guidelines: Demographic characteristics were revealed in the majority of cases, i.e. gender and age was included in 81 and 65 of 81 articles, respectively. Means were mentioned in 74 of the 81 articles and the cause of suicide of self-harm was attributed to a single factor in 35 of the 81 articles. Phrases that should be avoided were used in 32 of 81 articles and a photograph of the diseased or location was included in 20 of the 81

articles. An interview with a bereaved was included in 15 articles and 16 of 81 articles had a prominent placement on page three. No articles included information about help-seeking or educated about suicide.

Indicators of compliance to guidelines: In two of the 81 articles, an unusual method for the locality was described. Earlier suicides were mentioned in two of the 81 articles and one article described a suicide hotspot. Articles never had the main headline on the front page and a celebrity suicide or the content of a suicide note was never mentioned.

Discussion: Personal information in suicide reporting can make a vulnerable reader identify and possibly imitate the episode. The level of demographic details in our articles is therefore problematic. Visualization of the episodes was prominent, but whereas the Sinhala articles mainly used photographs, the English newspapers used drawings. While pesticides and hanging are the most commonly used methods of self-harm/suicide in Sri Lanka, hanging was the most frequently mentioned means in our articles. Pesticide ingestion surprisingly rarely featured. Others have noted over-reporting of suicides involving more dramatic methods and while pesticide ingestion might seem a dramatic mean, the pervasive use of it in the Sri Lankan context might have normalized its occurrence.
Self-harm in Sri Lanka has been described as a sudden, impulsive action, which also explains why no suicide note was mentioned in any articles. Information about the complexities of self-harm and suicide was almost non-existing in the articles and especially the Sinhala articles reported mono-causality behind the self-harm or suicide. Advice or options for help-seeking were not included in any articles. Though mental health support services is limited in Sri Lanka, a number of non-governmental suicide hotlines do exist. Sri Lankan newspapers could play an important role in creating awareness about the existence of services as well as the complex causes behind suicide and self-harm.

In summary, poor-quality reporting was found for both Sinhala and English articles. These findings call for further training of journalists to ensure responsible reporting of self-harm and suicide in Sri Lanka.

T43. SUICIDE ATTEMPTER CHARACTERISTICS IN A HEALTH MAINTENANCE ORGANIZATION IN ISRAEL

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Background: Suicidal attempts imprint on survivors in multiple spheres of life as well as their families. To deal with the phenomenon many nations have suicide prevention programs. In 2013, the Government of Israel decided that suicide prevention is of a national priority, and launched a national suicide prevention program. Faced with an increased suicide rate, in 2015 the Ministry of Health established a National Professional Council to advise the Ministry of Health on strategies to indent the suicide rate. One recommendation was to develop a hospital-based national reporting system for subsequent community healthcare. During 2016 Meuhedet health services, a 1,176,000 member Israeli health maintenance organization, established a professional Committee to formulate, and develop strategies to reduce suicidal behavior among its members. As part of the Committee actions a suicide attempts register was developed, to identify persons at risk of suicide attempts.
Methods: The register was characterized and was based on daily reported cases who attempted suicide and were then hospitalized. The register includes demographic information

(sex, birth year, city, region), information on visit dates to: mental health therapists, primary care physicians and social workers in the year preceding the suicide attempt. This information includes the identity of the practitioner, and the date of the last meeting between them. From 2009 to 2016, 850 members of Meuhedet Health services made 1000 suicide attempts that cumulated in an emergency units admission and hospitalization. This group was characterized by age, gender, geographic region, time of admission, day and month of the admission and the date of medical visits (GP, mental health professionals and social workers) prior the suicide attempts.
Results: An annual average frequency of suicide attempts that subsequently ended with hospitalization was 13/100,000. Among the suicide attempters, 61.3% were females. In total, 49.7% were in the age group 15-35. The peak period of suicide attempts (27%) was between June and August (summer). In total 59.7% of the attempts took place during the night (20:00-08:00). The lowest frequencies of suicide attempts (12.0%) occurred on Saturdays (the Jewish and national day of rest) and the highest frequency (16.7%) was during Sunday (the first business day of the week in Israel). Among the attempters, 28.8% met a mental health professional during the year preceded the attempt, 4.2% of them met the mental health professional in the same day of the attempt, 15.2% within one week before the attempt and 37.7% within one month before the attempt. 93.3% met a GP during the year preceded the attempt, 9.8% of them met the GP in the same day of the suicide attempt, 32.1% had a visit up-to 7 days before the attempt and 63.9% met the GP within one month before the attempt.
Discussion: Registry data offer a pragmatic approach to suicide prevention by identifying persons at risk, direct evidence based prevention measures. The results identified demographic characteristics and critical periods for suicide attempts. The results emphasize the potential important role of primary gate-keepers (GPs, mental health professionals and social workers) in the detection of people at risk for suicide attempts and subsequent suicide prevention.

T44. THE ROLE OF COUNTIES IN SUICIDE PREVENTION

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Background: Suicide is a serious public health problem in the United States. The suicide rate has continued to rise since the early 2000s and has increased 28% over the last fifteen years. However, the suicide rate varies greatly across states and counties. The 2008-2014 age-adjusted suicide rate ranged from 4.97 in Kings, New York to 85.09 in Wade Hampton, Alaska. The purposes of this study were (1) to assess whether certain county level factors are associated with higher suicide rates and (2) to evaluate different county suicide prevention policies and practices.
Methods: Quantitative and qualitative methods were both employed.
The dependent variable was the 2008-2014 county age-adjusted suicide rates per 100,000 population. The independent variables were county mental health professional rates, county rural percentages, and counties in states that offer county oriented systems of mental health care. The county mental health professional rate and county rural percentage were gathered from the publicly accessible 2016 County Health Rankings and Roadmaps data from the

University of Wisconsin and Robert Wood Johnson Foundation. The names of states offering county oriented systems of mental health care were obtained from the National Association of County Behavioral Health & Developmental Disability Directors (NACBHDD). The control variables were county demographic characteristics, collected from the 2016 County Health Rankings data.

Pearson correlations were first calculated between the age-adjusted suicide rate, the independent variables, and demographic variables. Multilinear regressions then tested for associations between the dependent and independent variables, controlling for significant demographic variables.

Key informant interviews with county health officials were employed to gain a deeper understanding of various types of local suicide prevention services.

Using stratified simple random sampling, four counties were sampled from the following groups for interviews: urban counties with county oriented systems of mental health care, rural counties with county oriented systems of mental health care, urban counties without county oriented systems of mental health care, and rural counties without county oriented systems of mental health care. Interview topics included the types of suicide prevention services offered, impediments to implementing services, and possibilities for the future.

Results: Rurality and county oriented systems of mental health care were both significant predictors of the age-adjusted suicide rate. Using multilinear regression adjusting for demographic variables, we found for every 20% increase in rurality, there is one additional suicide per 100,000 population ($p<.001$). The counties in states with county oriented systems of mental health care had 1.4 less suicides per 100,000 population relative to the counties in states without county oriented systems of mental health care ($p<.001$).
The interviews highlighted the variability in both the role the county government plays in suicide prevention services and the types of services offered. Despite these variabilities, the counties had similar difficulties in implementing suicide prevention services. The main difficulties were stigma, funding, and lack of mental health providers. The sampled urban counties offered more thorough services than the rural counties.

Discussion: County suicide rates and suicide prevention services vary greatly across the country. To our knowledge, this is the first study to show county oriented systems of mental health care are associated with lower suicide rates. We conclude all levels of government should collaborate to provide resources and emphasize local suicide prevention services.

T45. ADVANCED PRACTICE NURSES ATTITUDES TOWARD SUICIDE IN THE 15-24-YEAR-OLD POPULATION

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Background: Suicide in teen and young adults is a national problem, in fact it is the second leading cause of death for the 15-24-year old population. Advanced practice nurses are in a unique position to address suicide by conducting assessments at each contact with 15-24-year old patients.
Methods: A convenience sample of national advanced practice psychiatric and pediatric nurses will be obtained from postings on professional websites or sending invitations to members utilizing anonymous Qualtrics© survey that will include demographic questions

and the Suicide Opinion Questionnaire (SOQ). A minimum of 102 subjects are needed for the proposed study or 51 subjects from each of the two groups.
Results: Results are currently pending.
Discussion: 75% of Nurse Practitioners (a large subset of advanced practice nurses) are in primary care. Since many patients have contact with their PCP or mental health provider prior to suicide (Luoma, Martin, & Pearson, 2002; Mann, 2005; SPRC, 2015), this is an opportunity for intervention if a suicide assessment occurs at each encounter.
There is a minimal amount of evidence-based practice and research in the advanced practice nursing disciplines.

Suicide data about seeing a PCP or psychiatric-mental health provider is based on studies with adults, not 15-24-year-olds.

Mann et al. (2005) indicated physician education about suicide prevention helps reduce suicides. Integrating a standard in advanced practice nursing could reduce suicides.

Creating standardized nursing best practice guidelines for advanced practice nurses and novice nurses to include an assessment of suicide as the question to ask at each contact with teen and young adults can reduce suicides.

T46. CESSATION OF SELF-HARMING BEHAVIOR IN PATIENTS WITH BORDERLINE PERSONALITY DISORDER

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Background: Dialectical Behavior Therapy (DBT) is a method developed for patients with Borderline Personality Disorder with serious suicidal and self-harm behavior. Between 46% and 92% of patients with Borderline Personality Disorder attempt suicide, and between 3% and 10% ends his/her life. Self-harm behavior is a known risk factor for suicide. Deliberate Self Harm is defined here as the deliberate, direct destruction of body tissue without conscious suicidal intent, but resulting in injury severe enough for tissue damage (e.g. scarring) to occur. Patients who self-harm more than once have approximately double the risk of subsequent suicide compared to those that do not engage in self-harm.
DBT is well documented to have effect on emotion dysregulation and self-harm two of the main criteria for BPD. The documentation is still scares in relation to exactly how and when in the therapy process the self-harm ceases. There is also shortage of knowledge in regards of the difference, if any, between those who respond quickly to therapy directed at self-harm or those who respond late.

Methods: The sample of participants in this study consisted of 46 outpatients showing Borderline Personality traits and self-harm behavior, and received and completed a outpatient DBT-program in Norway. The participants were split into two groups, based on median amount of time before stopping self-harm behavior, termed quick and late responders.
Personality traits were assessed with the Personality Diagnostic Questionnaire for DSM 4, and participants that scored above clinical cut-off were assessed with the Structured Clinical Interview for DSM-4 Axis 2 Personality Disorders. Additionally the participants were assessed for degree of symptoms of depression (Beck Depression Inventory), hopelessness (Becks Hopelessness Scale), Quality of life (WHO Quality of Life- Brief) and the Global Assessment of Functioning, split version. Systematic review of patient journal was used to

collect data on frequency method, and duration of self-harm behavior, as well as instances of suicide.

Results: The results indicated that 93.5% of the patients ceased self-harming during treatment. On average, it took 20 weeks before patients terminated their self-harm. A median split in time to stop self-harming, gave two groups were the quick responders stopped the self-harming within 12 weeks (M=2 weeks, SD=3.0), and the late responders 12 weeks or later were labeled late responders (M=40 weeks, SD=15.8). The groups did not differ in method, or severity of self-harm. The most frequently used self-harm method, in both groups, was scratching with a knife or a razorblade. In neither groups did any participant die by suicide during the treatment.
There was no difference between the quick and the late responders according to demographic variables or symptom severity before treatment. Both groups reported significant reduction in symptom severity, quality of life or general functioning at the end of the treatment, but there were no significant differences between the quick and the late responders.

Discussion: The findings support previous findings that DBT is a highly effective treatment for self-harming behavior in patients displaying traits of BPD. The response time to DBT-treatment, in this case; time before self-harm ceases, is not necessarily related to symptom reduction or symptom severity. This highlights the importance of retaining patients in DBT treatment, although they may strive to end their self-harming. The findings may also indicate that the process of self-harming may be a specific component relatively unrelated to other symptom domains. Clinical implications will be discussed.

T47. CRANIAL ELECTRIC STIMULATION TO MODIFY SUICIDE RISK FACTORS IN PSYCHIATRIC INPATIENTS.

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Background: The adult psychiatric inpatient service here at the University of Maryland has successfully initiated a double-blind, randomized clinical trial of adjunctive cranial electric stimulation (CES) to assess the effects of the intervention on modifying suicide risk factors. We hypothesize that the intervention will result in faster suicide risk reduction in psychiatric inpatients compared to adjunctive sham treatment. Additionally, we aim to assess the safety, feasibility, and acceptability of conducting a randomized control trial in an active teaching inpatient service among patients and unit staff.
Methods: A double-blind, randomized clinical trial of adjunctive CES compared to adjunctive sham treatment. Rating scales at baseline (i.e., pre-treatment), twice a week, and at the end of the study are used to assess primary efficacy outcome measures. Patient safety and staff acceptability/feasibility will be assessed via the Generic Assessment of Side Effects (GASE), Satisfaction survey, and Narrative Evaluation of Intervention Interview (NEII) respectively. Staff feasibility and acceptability will be assessed via the administration of online surveys.
Results: To date, this is the first study to target acute suicide risk factors using a non-pharmacological approach in an inpatient setting. Thus far, we have screened over 300 patients out of which 30 were recruited, and 30 successfully completed the study. Furthermore, the study has been well received by both patients and unit staff. Results from

our safety, feasibility, and acceptability survey analysis are pending at the time of this abstract submission.

Discussion: Data from the Centers for Disease Control and Prevention (CDC) shows that the suicide rate in the United States has increased by 24%, from 1999 to 2014. CES as an augmentation strategy to reduce suicidality in psychiatric inpatients is being tested in our study. We anticipate a favorable response to study conduction in an inpatient psychiatric unit through measurements of safety, feasibility, and acceptability.

T48. NIGHTMARES PROSPECTIVELY PREDICT SUICIDE ATTEMPTS IN AN INPATIENT PSYCHIATRIC SAMPLE OF MILITARY VETERANS

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Background: The veteran suicide rate significantly exceeds the civilian rate (Nock et al., 2013), with an average of 20 veterans dying by suicide each day (Department of Veterans Affairs, 2016). Although sleep problems (e.g., insomnia, nightmares) have been identified as cross-sectional correlates of suicidal thoughts and behaviors (STBs) in veterans (Pigeon et al., 2012a), few longitudinal studies have examined sleep problems as a risk factor for STBs. Existing longitudinal studies indicate that insomnia symptoms are a risk factor for suicide ideation (SI; Bryan et al., 2016; Ribeiro et al., 2012) and suicide death in veterans (Pigeon et al., 2012b). However, only one study has examined the longitudinal sleep-suicide relation in a high-risk sample of veterans recently discharged from inpatient psychiatric care (Bryan et al., 2016). Bryan and colleagues (2016) found insomnia severity was predictive of SI, but not suicide attempts (SA; Bryan et al., 2016). Research in civilians has shown nightmares to be a risk factor for SA (Sjöström et al., 2007, 2009), but this prospective prediction has not been examined in veterans. Given that the risk for suicide is heightened during the year after discharge from inpatient care (Goldacre et al., 1993), it is crucial to examine sleep problems as a risk factor during this high-risk period. The present study examined sleep problems (i.e., insomnia symptoms and nightmares) as risk factors for SI and SA in a veteran sample during a high-risk time—the year following discharge from inpatient psychiatric care.

Methods: Participants 124 military veterans, ages 19-66 years (Mage = 38.99, SD = 12.97; 65% male; 82% Caucasian), receiving acute inpatient psychiatric care at a Veterans Healthcare Administration (VHA) facility. Seventy-seven veterans (60.6%) were admitted to acute care for suicidal thoughts and/or behaviors. During the baseline, which occurred on a VHA inpatient psychiatric unit, veterans completed the Self-Injurious Thoughts and Behaviors Interview (Nock, et al., 2007), Insomnia Symptom Questionnaire (ISQ; Okun, et al., 2009), and the nightmares item from the Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5; Weathers et al., 2013). Veterans completed phone interviews 1 and 3 months later to assess STBs since baseline. Veterans were also followed in the VHA medical record to track SAs 1-year post-discharge.

Results: 29 unique veterans endorsed SI over the 3-month follow-up and 14 veterans had an SA over the 1-year follow-up. Logistic regression was used to predict presence of SI and SA over the follow-up. No individual insomnia symptoms or nightmares significantly predicted SI over the 3-month follow-up (p values range from .43 to .923). However, experiencing nightmares significantly predicted SA over the 1-year follow-up (OR = 1.545 [1.00, 21.99], p = .050).

Discussion: Findings indicated that experiencing nightmares is a unique predictor of SA, but not SI, among veterans. A growing body of research in civilians indicates that frequent nightmares are associated with SA, retrospectively and prospectively (Sjöström et al., 2007, 2009). Individuals who experience nightmares are also at higher risk of having multiple SAs (Nadorff, et al., 2014). How nightmares confer greater risk for suicidal behavior and not suicidal thoughts is unclear. The presence of nightmares may indicate a state of overarousal which might be a unique mechanism leading to suicidal behavior (Ribeiro et al., 2013). Additional research is needed in high-risk samples of veterans to clarify how nightmares predict SA. Future research could use sleep diary logs to provide more accurate data on nightmare frequency and nightmare content than recall data to further clarify this relation.

T49. PREDICTIVE UTILITY OF AN EMERGENCY DEPARTMENT DECISION SUPPORT TOOL: SECONDARY DATA ANALYSIS OF PATIENTS WITH ACTIVE SUICIDAL IDEATION

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Background: Emergency department (ED) clinicians must routinely decide the disposition of patients with suicidal ideation, with potential consequences for patient safety and liability, as well as system costs and resources. In 2015, the Substance Abuse and Mental Health Services Administration and the Suicide Prevention Resource Center used a RAND consensus methodology to develop a decision support tool. It stratifies patients with passive or active suicidal ideation into those who could be considered "low risk" and prioritized for discharge versus those needing further evaluation. The Decision Support Tool consists of six dichotomous items: thoughts of carrying out a suicide plan, suicide intent, past suicide attempt, significant mental health condition, substance use problem and irritability/agitation/aggression. The presence of any of these items suggests that the patient has "elevated risk" and a need for further evaluation. The current study tested the predictive utility of the Decision Support Tool using existing data from the Emergency Department Safety Assessment and Follow-up Evaluation (ED-SAFE) study.

Methods: ED patients with active suicide ideation (n=1368) were followed for 12 months after an index visit using telephone assessment and medical chart review. Because the ED-SAFE did not use the original Decision Support Tool, the six risk indicators comprising the tool were carefully mapped to risk criteria that were collected as part of the ED-SAFE's baseline assessment and which were conceptually similar or identical. The primary outcome was prospective fatal or non-fatal suicidal behavior.

Results: Almost all patients (n=1365/1368; 99.8%) met the tool criteria for "elevated risk" at baseline. Therefore, the Decision Support Tool had perfect sensitivity, but exceptionally low specificity, in predicting suicidal behavior within six weeks (sensitivity: 100%; specificity: 0.24%) and 12 months (sensitivity: 100%; specificity: 0.28%). Decision tree analyses will be presented. In logistic regression analyses, several individual tool items were significantly associated with suicidal behavior within six weeks (suicide plan: OR= 2.8, 95% CI:1.2-6.5; past suicide attempt: OR= 2.3, 95%CI: 1.3-4.2) and 12 months (suicide plan OR= 2.4, 95%

CI:1.4-4.2; past suicide attempt OR= 1.6, 95%CI: 1.1-2.3; suicide intent OR= 1.4, 95% CI:1.0-2.0; significant mental health condition OR= 2.9, 95% CI:1.4-5.8; irritability/agitation/aggression OR= 1.9, 95% CI:1.1-3.3).

Discussion: This is the first empirical examination of this Decision Support Tool. In its recommended formulation, the Decision Support Tool did not perform well in predicting suicidal behavior with this sample of ED patients with active suicidal ideation. Future studies of the Decision Support Tool should administer the tool in its intended operationalization and should also include patients with passive suicidal ideation. Additional analyses revealed important suggestions for alternative strategies for using the tool to inform assessment, as several of the individual tool items possessed modest predictive utility.

T50. DOES CHILDHOOD TRAUMA MODERATE THE RELATIONSHIP BETWEEN DEPRESSION SEVERITY AND SUICIDE IDEATION?

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Background: Previous studies have shown an association between childhood trauma and chronic depression (Chapman et al., 2003; Ullman, 2003; Oquendo et al., 2005), suggesting that childhood trauma may create a vicious cycle of vulnerability in neurological development, and therefore the development of Major Depressive Disorder (Oquendo et al., 2005; Carr et al., 2013). Some researchers believe that there is a possible mediation between biological processes and abuse history (Brodsky et al., 2001), with childhood trauma leading to vulnerability to suicidal behavior (Brodsky & Stanley, 2008). There is also some debate surrounding the relationship between depression severity and suicidal ideation (McHolm et al., 2003; Oquendo et al., 2005; Brodsky et al., 2001). We had previously found that suicidal ideation is related to specific component of depression, primarily subjective symptoms (Keilp et al., 2012), and that the effects of treatment on these subjective symptoms account for reductions in suicidal ideation (Grunebaum et al., 2013). The current study aims to add to this discussion by exploring whether the relationship between depression severity and suicide ideation is moderated by childhood trauma.

This study employed the Childhood Trauma Questionnaire (CTQ), the 24-item Hamilton Depression Rating Scale (HDRS), the Beck Depression Inventory (BDI), and Scale for Suicidal Ideation (SSI) in assessing patients for childhood trauma, depression severity, and suicidal ideation (Bernstein et al., 1994; Hamilton, 1960, 1967; Beck et al., 1974). The CTQ assesses five dimension of childhood adversity: physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect (Thombs, Bernstein, Lobbestael, & Arntz, 2009). Hamilton and Beck Depression scales were decomposed into relevant component factors (five for HDRS; three for BDI) as in our previous analyses (Grunebaum et al., 2005).

Methods: Subjects were 240 individuals with DSM-IV Major Depression. Parametric correlations were used to compare patients' scores on each subscale of the CTQ and their relationship to HDRS and BDI total scores and factors, and the SSI. Stepwise multiple regression was used to determine if childhood trauma moderated the relationship between depression severity and suicidal ideation, such that the presence of childhood trauma increased the degree of ideation at comparable levels of depression severity

Results: Only the Emotional Abuse subscore of the CTQ was related to depression severity (r=.22, p=.001 with HDRS total; r=.21, p-.001 with BDI total) with the strongest relationship between Emotional Abuse and the HDRS Anxiety factor (r=.30, p<.001). The only correlation between CTQ subscales and the SSI was with Emotional Abuse (r=.11, p=.08). In a stepwise regression, depression factors that we had previously found associated with suicidal ideation (HDRS Psychic Depression ß=.22; Beck Subjective Depression, ß=.18; and Beck Self-Blame, ß=.20), as well as the HDRS Loss of Motivation factor (ß=.14) contributed to an equation that predicted 30.3% of the variance in current suicidal ideation score (Multiple R=.55, F[4,235]=25.5, p<.001). CTQ scores did not contribute significantly to the equation.

Discussion: The current study adds to the existing literature by analyzing an important relationship between depression severity, childhood trauma and suicidal ideation. Childhood trauma did not moderate the relationship between depression severity and suicidal ideation, suggesting that any contribution to increased suicidal thinking is either via its contribution to the development of depression itself or its influence on other factors associated with suicidal ideation.

T51. THE RELATIONSHIP BETWEEN SMOKING AND SUICIDAL BEHAVIOR IN PSYCHIATRIC PATIENTS WITH MAJOR DEPRESSIVE DISORDER

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Background: Smoking has been frequently associated with suicidal behavior, but it is also strongly associates with other risk factors for suicide. Thus, whether this association is causal or due to confounding factors remains unclear. We previously found a strong cross-sectional association between smoking and suicide attempts (SAs) among psychiatric patients with depression. In this study, we investigated whether smoking independently predicts SAs or modifies risk of SAs during major depressive episodes (MDEs).

Methods: In the Vantaa Depression Study (VDS), a longitudinal study of psychiatric patients (N=269) with major depressive disorder (MDD), prospective follow-up interviews were performed after baseline at 6 months, 18 months, and 5 years. Smoking was ascertained by self-report at each time point. We investigated at each interview the association of suicidal ideation and smoking and the significance of current smoking as an independent risk factor for SA before the next interview. In two-level analyses of risk during MDEs, smoking was entered as either a patient-specific (time-invariant) or an episode-specific (time-variant) variable.

Results: Suicidal ideation was not significantly associated with smoking. We found no significant association between smoking and SAs after controlling for confounding factors in multivariate regression models, nor did we observe any evidence of a significant effect during MDEs.

Discussion: In this prospective cohort study of patients with MDD, smoking was neither significantly associated with suicidal ideation nor predicted suicide attempts. The cross-sectional association observed between smoking and suicide attempts among MDD patients was likely due to confounding by other risk factors.

T52. HISTORY OF SEXUAL ABUSE AS A PROSPECTIVE RISK FACTOR FOR SUICIDE BEHAVIOR

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Background: Suicide and suicidal behavior are a public health problem and are among the leading causes of death worldwide, including Argentina. The aim of the present study is to evaluate history of sexual abuse as a prospective predictor of suicide attempts among a high-risk suicidal patient sample.
Methods: An analytical, observational, prospective cohort study with a 2-year follow-up was conducted. A total of 183 participants were included in the study, and 157 participants completed the follow-up period. Participants were administered a semi-structured interview with demographic and clinical questions, the MINI International Neuropsychiatric Interview (Ferrando, Bobes & Gilbert) and the SCID-II. (Villar et al., 1994) History of sexual abuse, which was defined as any sexual activity where consent is not or cannot be given, was assed with the semi-structured interview. In addition, the Columbia-Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011), Beck Hopelessness Scale (BHS; Mikulic, Cassullo, Crespi, & Marconi, 2009), Barratt Impulsiveness Scale (BIS-11; Lopez, Cetkovich-Bakmas, Lischinsky, Alvarez, & Torrente, 2011), and the Buss-Durkee Hostility Scale (BDHI; Oquendo et al., 2001) were included in the measures battery. Patients then completed a follow-up phone screener every 6 months to determine if they have an unfavorable outcome (new suicide attempt or suicide). Differences between patients with and without sexual abuse were analyzed with a COX regression analysis.
Results: Form the sample, 77 participants (49%) reported history of sexual abuse. There were 42.3 events/ 100 persons-years unfavorable outcomes (new suicide attempt or suicide) during the follow-up period. The Hazard Ratio (HR) for history of sexual abuse corrected by different confounders was 1.73 [CI 95% = 1.07 - 2,80]. The Beck Hopelessness Scale (HS), Barratt Impulsiveness Scale (BIS-11) and Buss-Durkee Hostility Scale (BDHI) did not significantly modify the HR.
Discussion: The current results suggest history of sexual abuse served as a prospective risk factor for suicidal behavior in the current sample. However, hopelessness, impulsivity, or hostility did not play a role in this relation. These findings indicate the importance of assessment and intervention specific to previous traumatic experiences among individuals presenting risk for suicidal behavior and previous sexual abuse.

T53. FREQUENCY OF LETHAL MEANS ASSESSMENT AMONG EMERGENCY DEPARTMENT PATIENTS WITH A POSITIVE SUICIDE RISK SCREEN

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Background: Many emergency department (ED) patients with suicide ideation (SI) or attempts (SA) do not have documented lethal means assessments (e.g., being asked about home firearms). The specific objectives of this study were to: (1) estimate how often ED

providers documented lethal means assessment for suicidal ED patients, and (2) compare patients who were and weren't asked about lethal means access.
Methods: At an ED with universal screening for suicide risk (an ED-SAFE trial site), we reviewed 800 charts from a random sample of adults (>18 years) with a positive screen from 8/2014 to 12/2015.
Results: Only 18% (n=145) had documentation by ≥1 provider of assessment of lethal means access; only 8% (n=11) of these had documentation that someone discussed an action plan to reduce access. Among 545 patients with a positive suicide screen who were discharged home, 85% had no documentation that any provider assessed access to lethal means. After adjustment through multivariable logistic regression, the only variables that remained significantly associated with having documented lethal means assessment were: age 18-34 years (Odds ratio [OR] 3.72, 95%CI 1.93-7.17) or age 35-59 years (OR 2.90, 95%CI 1.49-5.65), each compared to age ≥60 years; chief complaint involving psychiatric behavior (OR 4.36; 95%CI 2.04-9.29); psychiatric admission/transfer (versus discharge; OR 1.88; 95%CI 1.15-3.07); and current SI (OR 3.42; 1.34-8.73).
Discussion: Our study offers important findings as the first objective review of documented lethal means assessment among suicidal patients at a hospital with universal screening for suicide risk. The overall rate of documentation – only 18% – further heightens concerns about how infrequently lethal means counseling may be occurring for suicidal ED patients. Age-based differences in assessment support the need for further examination of care of older adults with suicide risk, as this population has particularly high suicide rates (and their deaths often involve firearms). Further work clarifying the most effective training for providers and most effective messaging for patients will be critical to reduce the toll of suicide.

T54. MENTAL HEALTH SYMPTOM AND SUICIDE RISK MONITORING UTILIZING COGITO BEHAVIORAL ANALYTIC PLATFORM

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Background: Military personnel returning from deployment often experience increases in psychological symptoms, including post-traumatic stress disorder and depression. These symptoms have been associated with increased suicide risk. Historically, clinicians have relied on patient retrospective self-report to evaluate symptoms and mood over time; however, self-monitoring methods such as health diaries can be unreliable and incomplete, making interpretation and use of the information more challenging. The development of smartphone technology has created an accessible means to record, self-monitor, display and report health information. One such system, "Cogito Companion" developed by the Cogito Corporation, continuously collects and interprets the social signals underlying smartphone behaviors, as a secure, privacy-compliant mobile application (app). Implementation of innovative technological applications, such as mobile phone apps, can ultimately improve providers' ability to monitor for meaningful behavioral changes that may impact level of suicide risk and prompt providers to monitor more closely or intervene when clinically indicated. The objectives of this presentation are to: 1) evaluate the acceptability, feasibility, and 2) assess challenges in implementing an innovative technological approach to monitoring mental and behavioral health symptoms in a Veteran population.

Methods: This study has IRB approval. Veterans complete clinical interviews and self-report measures at the initial appointment. Participants download the app and use it for 3 months. The app includes regular notifications to complete self-report surveys (PHQ-9, PCL-5) and gathers behavioral information describing physical and interpersonal functioning, mood, and movement. Behavioral indicator data is analyzed in real time and is displayed to participants and study clinicians to provide ongoing assessment of mental health. Study clinicians can monitor and implement outreach strategies to potentially at-risk individuals. Acceptability of the intervention is assessed using a qualitative interview and a satisfaction questionnaire three months post-initial appointment. Feasibility is examined by assessing recruitment and retention of participants.
Results: To date, the preliminary pilot sample of 45 Veterans have been consented, and 23 Veterans have completed the entire study. Initial results support feasibility and acceptability of the mobile phone app. Qualitatively, Veterans have shared that they like having some control over their use of the app and self-monitoring of symptoms. Some participants discussed how specific app functions provided motivation to be more social and active. Veterans also have provided feedback regarding the limited ability to record their own "mood" rating at their leisure. Barriers to feasibility include use of Android platform only, inconsistent data flow and survey completion.
Discussion: The benefits of harnessing technology in the field of suicide prevention is widespread, reducing barriers to care by shrinking geographical limitations, increasing outreach and assessment to rural communities, and providing a wider range of communication channels for at-risk populations to receive care before or during crises. This presentation will evaluate and assess the use of smartphone technology to provide novel strategies for monitoring suicide and associated risk factors in Veterans. Finally, this presentation will incorporate how technological advancements can guide innovative research, optimize clinical recommendations, and promote suicide prevention and monitoring efforts.

T55. HOSTAGE NEGOTIATION TECHNIQUES: ASSESSING THE USE OF ACTIVE LISTENING SKILLS

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Background: During crisis negotiation incidents, law enforcement hostage negotiators seek to influence a behavioral change in the subject to gain their voluntary compliance. Effectively using active listening skills (ALS) is critical to a negotiator being successful in this task. This is especially true during interactions with suicidal persons.
Methods: This presentation and poster submission will present preliminary data on a study that is assessing negotiators' use of three specific micro skills of ALS (emotional labeling, open-ended questions, and paraphrasing) with respect to a scenario where they are engaging a suicidal person. The study involves the participants completing a questionnaire containing 18 questions.
Multiple analyses with be conducted to determine the overall negotiators' accuracy with the micro skills, if there are significant differences in accuracy based on the various ALS micro skills, and if there are significant differences based on negotiator demographics.

Results: The data collection and analysis will be completed by August 2017.
Discussion: Due to the dynamics of law enforcement crisis and hostage negotiation work, access to these professionals is often limited. Further, there is ample training and research suggestions on the suggested skills that make a hostage negotiator effective yet currently the

existing data on the effective use of these skills is limited. This study is bridging the gap between the espoused theory and the theory-in-use with respect to ALS and law enforcement hostage negotiators. The results can inform practitioners as well as instructors and additionally it can guide further research on this topic.

T56. MINDFULNESS AND SUICIDE-RELATED COPING ARE INVERSELY RELATED TO CURRENT SUICIDAL IDEATION IN HIGH SUICIDE-RISK VETERANS

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Background: Individuals with a recent history of significant suicidal behavior (e.g., suicide attempt (SA), suicidal ideation (SI) resulting in hospitalization) and recurrent SI are among those at highest risk for SA (Franklin et al., 2017). Studies testing psychological factors associated with SI in high suicide-risk groups are few. Treatments to prevent SA (e.g., Cognitive (CT) for the prevention of SA and Mindfulness-Based CT to prevent suicide attempt (MBCT-S)) are predicated, in part, on theories implicating a preoccupation with negative aspects of experience and deficient coping in recurrent SI and thus SA risk in high suicide-risk groups (e.g., Williams et al., 2015). Thus, mindfulness and coping skills are targeted in treatments. The purpose of this study was to test whether risk factors for SA that are targeted in treatments, including suicide-related coping and mindfulness, distinguish high suicide-risk Veterans with and without current SI.

Methods: Baseline data from 118 Veterans who participated in a randomized controlled trial testing MBCT-S (Kline et al.) were used. Veterans were recruited into the study after an index suicide-related event (i.e., severe SI to SA) or from the Veterans' Affairs high-risk for suicide list. Veterans completed the Scale for Suicide Ideation (SSI), the Five Facet Mindfulness Questionnaire (FFMQ), and the Beck Depression Inventory (BDI). Veterans also completed a suicide-related coping measure (SCM) (Stanley & Brown, under review) where self-efficacy, including beliefs and perceived skills in managing suicidal crises, were self-reported, and higher scores indicated greater perceived self-efficacy and coping skills for managing suicidal crises. Best-estimate diagnoses and suicide attempt history classifications were made using data collected during a semi-structured interview. T-tests and chi-square analyses were the primary analytic strategies to compare differences among high suicide-risk Veterans with and without current SI, as indicated by a non-0 SSI score. Negative binomial regressions were used in multivariate analyses.

Results: 81% (n=96) of high suicide-risk Veterans had current SI. Those without current SI reported greater mindfulness and suicide-related coping (FFMQ-acting with awareness mean difference between groups= 3.1, sd=1.1, $t(111)=2.9$, $p<.01$; SCM mean difference between groups= 7.9, sd=3.4, $t(110)=2.3$, $p=.02$). They also reported greater depression (BDI mean difference between groups= 10.1, sd=2.7, $t(113)=3.8$, $p<.01$). Other facets of mindfulness, e.g., non-judgment, did not differ between groups. Further, other factors (past-year and lifetime SA, diagnosis, sex, age and other demographics) were not significantly associated with current SI in univariate analyses. Moreover, among Veterans with current SI, suicide-related coping remained significantly and negatively associated with SI, independent of the effects of depression severity (change in $X2(1)= 6.8$, $p<.01$, BSCM=-.01, sd=.01, $p=.03$).

Discussion: We found a specific facet of mindfulness, acting with awareness or focus even in the face of distraction, and suicide-related coping were negatively associated with current SI among high suicide-risk Veterans. Our findings thus provide support to theories and interventions implicating and targeting these factors.

T57. THE IMPACT OF CLINICIANS' EMOTIONAL RESPONSES ON CLINICAL JUDGMENT AND TREATMENT DECISIONS WITH SUICIDAL PATIENTS

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Background: Clinicians' emotional responses (also known as countertransference) to patients have been recognized as potentially related to treatment outcome (Hayes, 2011). Recent studies have found that clinicians' conflicting emotional responses to high-risk patients are predictive of poor prospective suicidal outcomes (Hawes et al, 2017, Yaseen et al, 2017). However it is unclear whether this association is an indicator of patient downstream risk or is a potentiator in patient downstream risk. In this context, we aimed to examine one possible mechanism in which clinical judgment and treatment decision-making are affected by clinicians' emotional responses to suicidal patients.
Methods: Sample included 142 psychiatric outpatients who completed a battery of psychological measures, including the Columbia Suicide Severity Rating Scale (CSSRS), Beck Suicide Scale (BSS), and the Brief Symptom Inventory (BSI). Following the patient intake, mental health clinicians (n=22) evaluated patient suicide risk using a modified SAD PERSONS scale, clinically predicted risk for future suicide attempt on a 0-10 scale—the clinician prediction scale, and selected specific treatment decisions on a pre-designed 'Treatment Plan Form'. Clinicians' emotional responses to their patients were assessed with the novel self-report 'Therapist Response Questionnaire-Suicide Form' (TRQ-SF). We used General Linear Mixed Models to examine the effects of clinicians' emotional responses on clinician prediction scale and treatment decisions.
Results: Clinician emotional distress response to patients is associated with the clinical judgment of patient suicide risk ('clinical prediction scale') (β = .26, P =.001), independent from associations with patient suicidal ideation, global symptom severity, and the modified SAD PERSONS scale. Moreover, conflicting emotional responses are associated with decreased likelihood of clinician decisions to continue treatment (OR = .54, P = .002); clinician decisions to continue treatment are not associated with either the 'clinical prediction scale', the modified SAD PERSONS scale, or patient suicidal and global symptom severity indices.
Discussion: Clinicians' emotional responses to their patients are associated with clinical judgment of patient suicidal risk and critical treatment decision making, independent of known patient risk factors and established suicide risk assessment tools. Our findings demonstrate the potential pathway in which clinician emotional responses may impact patient suicidal outcomes through their contribution to clinical decisions. Implications for training and treatment will be discussed.

T58. DEVELOPMENT OF A TEXT-MESSAGE BRIEF CONTACT INTERVENTION FOLLOWING A SUICIDE ATTEMPT

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Background: Suicide is a leading cause of death, particularly among young people. Continuity of care following discharge from hospital is critical, yet this is a time when individuals often lose contact with healthcare services. A meta-analysis has shown that postcard-based brief contact interventions following a suicide attempt can reduce the number of repeat attempts, and text message interventions are currently being evaluated.
We sought to extend post-attempt caring contacts by designing a brief online intervention targeting proximal risk factors and the needs of this population during the post-attempt period. This presentation details the development process and describes the realised RAFT (Reconnecting AFTer a suicide attempt) system.

Methods: To inform the design of the intervention, a lived experience design group was established. Participants were asked about their experiences of support following their suicide attempt, their needs during this time, and how these could be addressed in a brief contact ehealth intervention. The intervention design was also informed by consultation with lived experience panels external to the project, and a clinical design group.
Results: Prompt outreach following discharge, initial distraction activities with low cognitive demands, and ongoing support over an extended period were identified as structural requirements of the intervention. Key content areas identified included coping with distressing feelings, safety planning, emotional regulation and acceptance, coping with suicidal thoughts, connecting with others/interpersonal relationships, and managing alcohol consumption.
Discussion: The RAFT text message brief contact intervention combines SMS contacts with additional online brief therapeutic content targeting key risk factors. It has the potential to reduce the number of repeat suicidal episode and to provide accessible, acceptable, cost-effective support for individuals who may not otherwise seek face-to-face treatment. A pilot study to test the feasibility and acceptability of the RAFT intervention is underway.

T59. THE PSYCHOLOGY OF PHYSICAL BRAVERY: RESILIENCE, TRAINING, AND ALTRUISTIC SUICIDE

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Background: Research indicates that acts of physical bravery ("an act in which the individual puts their safety at risk in order to save or help another individual who is in imminent risk") are linked to better resilience, a longer life span, protection from PTSD-related symptomatology, personal competence, and growth. Physical bravery has been defined as a factor of strength in Seligman's model of positive psychology and has been employed in clinical psychology as a healing component, and in improving humanity, as well as facilitating it in reaching great new heights. However, despite the widespread interest of researchers in physical bravery, there have been relatively few attempts to study this concept scientifically. The present study seeks to answer several key questions: Why do people risk their safety in order to protect others from harm? What qualities are required in order to

demonstrate physical bravery? Is physical bravery a capacity an individual is born with or is it a set of qualities that one learns through modeling and training (a capacity that is made)? How does a person's tendency to act bravely relate to their resilience to trauma and suicide? Lastly, to what extent does physical bravery relate to the notion of altruistic suicide?
Methods: The Physical Bravery Survey (PBS) was developed by the Clinical Crises and Emergencies research group at Palo Alto University under the guidance of Dr. Bruce Bongar via a comprehensive literature review about physical bravery and in consultation with experts in the field to ensure face and content validity. It consists of 47 multiple choice and free form questions aimed at collecting both qualitative and quantitative data from individuals who performed acts of physical bravery. The PBS is aimed at gathering data regarding: demographics, personal life history, events of physical bravery, factors associated with the individual's behavior, and reasons for the brave behavior. Participants administered this survey from 2012 to present include Active Duty and Veteran Service members of the United States Special Forces and civilian undergraduate students.
Results: Results demonstrated that individuals who reported histories of physically brave acts were more likely to have higher levels of resilience, adventurousness, confidence, flexibility in thinking, and humor. The data also suggests that while most people assume that physical bravery is learned, that level of training appears not to be related to a person's tendency to act bravely. Finally, some individuals report acting bravely despite thinking that doing so may prove fatal, which may be consistent with the notion of an altruistic suicide.
Discussion: Physical bravery may be related to qualities such as resilience and leadership. More research is needed to discern what is required to make a person act bravely; specifically, the notion of whether physical bravery is learned or innate remains uncertain. Further understanding physical bravery can help to further our understanding of suicide, resilience, and may also provide information to inform military recruitment and training practices.

T60. THE IMPACT OF COGNITIVE-BEHAVIOURAL THERAPY WITH MINDFULNESS (CBTM) CLASSES ON SUICIDAL THOUGHTS IN AN ADULT POPULATION

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Background: There is a need to develop mental health interventions that effectively support individuals with anxiety and mood disorders who experience suicidal ideation. The Anxiety and Mood Disorders Clinic at the Health Sciences Center, the main tertiary care hospital in Winnipeg, Canada developed a 4 – session Cognitive-Behavioural Therapy with Mindfulness (CBTm) Course for adults. This manualized low-intensity intervention provides an introduction to CBT by teaching principles and strategies for symptom reduction. Each class occurs one week apart and covers topics such as describing the cognitive behavior theoretical model of symptom etiology, relaxation strategies, cognitive restructuring, goal setting, and exposure therapy. Family members and support workers are welcome to accompany patients to the weekly classes. Approximately 20 to 30 patients attend each session.
Methods: A retrospective chart review was conducted to determine the impact of the CBTm Course on suicidal thoughts in this tertiary care population of adults with anxiety and mood disorders. All patients who attended the intervention between January 2014 to December 2016 were included in the study. Exclusion criteria included active suicidality and psychosis,

as patients with these symptoms required immediate high-intensity care. A sample of 288 charts were included in the study, and suicidal ideation was measured using an item on the DSM-5 Level 1 Cross Cutting Symptom Measure for Adults. Suicidal ideation was rated on a scale ranging from 0 (none or not at all) to 4 (severe or nearly every day).
Results: Longitudinal tobit regression was used to determine the effects of the CBT intervention on suicidal ideation scores. The results showed that patients with suicidal thoughts had a decreased score of 0.176 for each class attended ($p<0.001$).
Discussion: The CBTm Course had a significant effect on decreasing suicidal thoughts in patients with anxiety and mood disorders. The findings from this study informs clinicians and therapists about the effects of using low-intensity psychotherapy interventions, and that CBT targeting depression and anxiety can also have a non-specific benefit on reducing suicidal thoughts.

T61. THE IMPACT OF INTRAPERSONAL SKILLS ON THE ASSOCIATION BETWEEN RELATIONAL PEER VICTIMIZATION AND SUICIDAL IDEATION IN ADOLESCENTS

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Background: Relational victimization, which involves the use of relationships to harm the social functioning of others through behaviors such as exclusion, rumor-spreading, and manipulation, is highly prevalent among adolescents. Approximately 61% of adolescents report experiencing an act of relational victimization in the last 30-days. Relational victimization accounts for about half of all peer victimization experienced by adolescents. Unfortunately, this type of victimization has become more pronounced with increased use of social media, which can be used as a vehicle to perpetrate relational victimization. The experience of relational victimization is associated with numerous negative emotional consequences for adolescents, the most severe of which is suicidal ideation (SI) and behavior.

Though youth who are relationally victimized are at heightened risk for SI, not all youth with this history report SI. A potential moderator of this association is intrapersonal coping skills. Intrapersonal skills refer to the "capacity for understanding and expressing feelings." Adolescents with poor intrapersonal skills may be markedly vulnerable to relational victimization. Given their difficulty understanding and expressing their feelings, they may be more likely to internalize the emotional pain associated with relational victimization and less likely to disclose these experiences or ask for help. This may place them at greater risk for negative mental health outcomes, such as suicidal ideation or behavior.

Methods: Participants included 186 psychiatrically-hospitalized adolescents (M age = 15.05, 72.5% female, 83.3% White) and their parent. Adolescents and parents completed a diagnostic interview and self-report instruments. Peer victimization was measured using the Relational Subscale from the Revised Peer Experiences Victimization Questionnaire; SI was measured using the Suicidal Ideation Questionnaire; Intrapersonal Skills were measured using the Intrapersonal Subscale from the Bar-On Emotional Quotient Inventory.
Results: Results from a hierarchical linear regression analysis showed significant main effects for relational victimization experiences ($\beta = 13.25$, $p = .003$) and for intrapersonal skills ($\beta = -.51$, $p = .012$) on SI. Specifically, adolescents with more experiences of relational

victimization and those with lower levels of intrapersonal coping skills endorsed greater SI. However, intrapersonal skills did not moderate the association between relational victimization experiences and SI.
Discussion: Results suggest that adolescents who have experienced relational victimization should be monitored for the development of SI. Assessing and addressing levels of intrapersonal coping skills, as appropriate, in the context of intervention work with youth may also be indicated.

T62. "TIME TO STOP THE CIRCLE OF SUICIDAL TRANSMISSION?" A SYSTEMATIC LITERATURE REVIEW OF GUIDELINES AND INTERVENTIONS FOR CHILDREN OF PARENTS WITH SUICIDAL BEHAVIOR

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Background: Exposure to parental suicidal behavior is associated with higher risk of adverse outcomes like lower educational performance, drug abuse and delinquent behavior. Furthermore, transmission of mental illness and suicidal behavior from parent to child has been thoroughly demonstrated. For each suicide, there are approximately 6-10 times as many suicide attempts, and women account for three fourths of all suicide attempts. The vast majority of women attempting suicide are in their reproductive years. Hence, the probability of being a parent at this crucial time is high. When a patient is hospitalized after a suicide attempt, this presents a unique opportunity to identify whether the patient has children, and to provide adequate follow up measures for both parents and their children. The objective of this paper was to review the existing literature on follow-up measures for children subjected to parental suicidal behavior.
Methods: In line with the PRISMA statement, we conducted a systematic literature search in English and Scandinavian languages in PubMed, PsycInfo, Oria and the Cochrane Database of Systematic Reviews. We also screened six Scandinavian databases and the NICE Guidelines (UK), National Guideline Clearinghouse, Prospero, Clinicaltrials.gov. The key words in the search string were: "Suicide, Attempted "OR "Self-Injurious Behavior" OR "Suicide" OR "Suicidal Ideation" "Child of Impaired Parents "OR Parents OR Maternal Behavior OR Paternal Behavior OR Parent-Child Relations OR Paternal Deprivation OR Maternal Deprivation OR Parental Death OR Parenting OR "Family" OR "Adult Children OR "Family Relations" OR "Family Conflict" OR "Professional-Family Relations" OR "Caregivers"
The review was registered in PROSPERO prior to study initiation. The inclusion criteria were: Literature that described guidelines for screening or interventions for children (under 18 years) of parents hospitalized with attempted suicide.

Results: The search in PubMed and Psych Info resulted in a total of 1275 article titles, of which 72 abstracts were screened. Out of these, 31 full text papers were read, and a final four articles were included. Three of the included papers described parts of the same study from an emergency department in Hague, where a protocol was implemented for monitoring and referring children of suicide attempters to a Reporting Centre for Child Abuse and Neglect. The fourth article described the association between maternal attempted suicide and risk of abuse or neglect of their children. The search for clinical guidelines, registered trials,

systematic reviews and other relevant literature yielded no results. In two of the guidelines, caring for a minor child was only described in relation to whether it was a protective factor for the parent's further suicidal behavior.
Discussion: The lack of research and literature in this particular area is striking. Although the evidence is sparse as to what measures may be effective in preventing transmission of suicidal behavior, the circumstances surrounding a parent's suicide attempt call for appropriate familial care. However, we cannot exclude the possibility that efforts made by health professionals, local routines and clinical practice ensure sufficient care and follow-up, in spite of this being poorly documented.

T63. EXAMINING BASELINE CHARACTERISTICS OF PATIENTS WHO PREMATURELY WITHDRAW FROM INTENSIVE OUTPATIENT TREATMENT

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Background: The high rate of client initiated early termination is a substantial concern in the treatment of suicidal youth. One meta-analytic review showed that 47% of patients participating in psychotherapy terminate treatment prematurely. (Wierzbicki and Pekarik, 1993) Though treatment completion is higher for programs that are time limited and manualized, some clinical research units continue to report a drop-out rate of about 17%. (Hunt and Andrews, 1992) Patients who fail to complete treatment often experience more psychological distress and less therapeutic progress. Additionally, in a group setting, this can disrupt the group members' progress, sense of security, and may encourage other premature terminations. (Ogrodniczuk, Joyce, & Piper, 2004). To date little is known about the individual characteristics that influence withdrawal from treatment. This presentation aims to examine the baseline clinical characteristics of patients who prematurely withdrew from treatment in a suicide prevention focused intensive outpatient program (IOP) compared to patients who completed the treatment.
Methods: As part of a larger battery at baseline, demographic information was collected on all patients and clinicians identified patient vulnerabilities associated with suicide risk (e.g. limited social support, trauma history). In addition patients were administered the CHRT (Trivedi et al., 2011) and the QIDS (Rush et al., 2006) to assess active suicidal ideation and depression respectively. In order to address the aims of this study and compare those who withdrew from the IOP and those who did not, case control matching was performed using IBM SPSS (IBM Corp. Released 2013). Those who withdrew and those who did not were matched and were included in the subsequent analysis.
Results: A total of 385 adolescents entered into the IOP. Of these, 53 (13.77%) withdrew from treatment pre-maturely. Case-control matching was utilized to match patients who withdrew from the IOP (n=53) to those who completed the program (n=53) based on age, gender, and race. The mean age of participants was 15.07 ± 1.25. The majority were female (81.1%) and Caucasian (85.8%). Chi square analyses were conducted to compare the two groups on baseline clinical characteristics. The results suggest that those who withdrew early from the IOP were identified by clinicians as having limited social support at the outset of the program, with 47.2% of those who withdrew early having problems with social support compared to only 22.6% of those who completed treatment, [x^2 (1, N=106) =7.02, p=.01)]. No other clinical characteristics, including baseline depression, suicidality, vulnerabilities (e.g. bullying and substance abuse) or number of previous attempts, were related to premature withdrawal.

Discussion: The results of the current study indicate that social support is critical in treatment retention. When examining the clinical differences between the patients who completed treatment and those who withdrew, the only significant difference was in clinician-rated social support, with those who withdrew from treatment having more limited social support compared to those who completed the treatment. These results show that treatment programs must include skills to aid in increasing social support so as to promote completion of the treatment program.

T64. A PILOT STUDY OF THE IMPLICIT ASSOCIATION TEST TO EXAMINE UNCONSCIOUS ATTITUDES TOWARD SUICIDE

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Background: There are traditional ideas in Japanese society that attempt to understand suicide as an individual problem. In other words, it is an attempt to understand suicide based on aesthetic values. For example, there is the idea that suicide by "seppuku" is a brave act that preserves honor. Although a survey on suicidal people indicates that this way of thinking can be prejudicial and stigmatizing, these ideas strongly persist. People who hold such misconceptions cannot understand the trying situation faced by suicidal people and believe there is little need for suicide prevention. Promoting further suicide prevention in Japanese society will require accurate investigation of suicide and removing the stigma surrounding suicide. However, people are often unaware of their own prejudices, which makes investigation by survey or interview problematic. Also, survey bias can occur when respondents to questionnaires consciously select socially desirable answers. Therefore, a survey method is needed that can overcome the conscious defense of respondents. In this research, we explored the feasibility of the Implicit Association Test (IAT) to investigate the stigma surrounding suicide. The IAT is widely used in the measurement of various implicit attitudes such as stereotypes of race, gender, and sexual minorities. Therefore, the IAT is expected to be useful for measuring attitudes towards suicide. The IAT measures the nonconscious relationship between the target concept and the attribute by using a time delay of the experimenter's judgment of the combination of the target concept and the attribute. To implement the IAT, we must collect and select linguistic expressions (stimulus words) corresponding to target concepts and attributes as experimental materials. The purpose of this research was to research stimulus words of the target concept "suicide, death due to disease, accidental death" and attribute categories prior to implementation of the IAT.
Methods: The survey procedure was carried out in two steps. In step one, we asked participants for words related to the concepts of "suicide, death due to disease, accident death" by the free association method. In step two, we conducted a survey to screen stimulus words used for the IAT, utilizing the conceptual stimulus list obtained in step one. For stimulus words in the attribute category, we extracted related stimulus words with reference to the Stigma of Suicide Scale (SOSS; Kawamoto et al., 2017). Survey participants were 6 college students.
Results: From the survey, we extracted seven stimulus words for each of the target concepts "suicide, disease death, accident death." Similarly, with regard to attributes, we obtained three patterns ("beautiful vs. ugly," "sympathy vs. opposition," "good vs. bad") and found five stimulus words for each pattern.
Discussion: Implementing the IAT using the stimulus words identified in this study will make it possible to measure nonconscious attitudes about suicide. Thus, stigma of suicide can

be investigated properly to contribute to the breakdown of traditional stigmas surrounding suicide.

T65. NONLINEAR CHANGE PROCESSES DURING PSYCHOTHERAPY CHARACTERIZE PATIENTS WHO HAVE MADE MULTIPLE SUICIDE ATTEMPTS

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Background: Research suggests that multiple suicide attempters experience considerable variability in suicide ideation and longer-duration suicidal crises, which suggests the possibility of two states of stability (one low risk and one high risk). To date, however, few studies have examined nonlinear change processes in suicide ideation among patients.
Methods: In a sample of 76 active duty U.S. Army Soldiers receiving brief cognitive behavioral therapy (BCBT) for acute suicide risk, we examined differences in the ebb and flow of suicide ideation among multiple attempters, first-time attempters, and ideators. The suicide ideation item (item 9) of the Beck Depression Inventory, Second Ideation, was adminstered to patients at every BCBT session. Multilevel mixed effects models were used to examine the change process over the course of treatment and to test the cusp catastrophe hypothesis for each subgroup.
Results: Consistent with a cusp catastrophe model, results indicated that multiple attempters were characterized by two states of stability corresponding to low and high intensity suicide ideation; these states were separated by a region of instability corresponding to moderate intensity suicide ideation. In contrast, ideators and first-time attempters were characterized by only a single state of stability corresponding to low intensity suicide ideation.
Discussion: Among patients who have made multiple suicide attempts, suicide ideation may function as a bimodal rather than a continuous construct. Additional research is needed to identify the control parameters that influence change in suicide ideation among multiple attempters.

T66. THE SUICIDE IDEATION AND BEHAVIOR ASSESSMENT TOOL: DEVELOPMENT OF A NOVEL MEASURE OF SUICIDAL IDEATION AND BEHAVIOR AND PERCEIVED RISK OF SUICIDE

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Background: Suicide and suicide ideation is a common comorbidity of treatment resistant depression.1 Despite knowledge of important risk and protective factors, precursors to suicide such as ideation and behaviors remain under-recognized and undertreated.
To assist clinicians in identifying persons at risk for suicide a patient-rated tool that provides systematic, comprehensive data collection for monitoring and assessing suicidal ideation, behaviors and risk is needed. It should be sensitive to change without placing undue burden on patient or clinician. The Suicide Ideation and Behavior Assessment Tool (SIBAT) has been developed to meet these needs. It is based on an established measure of suicidal ideation and behavior: the InterSePT Scale for Suicidal Thinking–Plus2 and includes a clinical global impression of suicide risk and recommendations for consequent optimal

management. The SIBAT is divided into patient-report and clinician-rated sections. Development and preliminary content of the SIBAT are described.

Methods: A group of experts in scale development, suicidology, and clinical management of suicidal patients (the SIBAT Consortium) developed the SIBAT based on clinician consensus and review of suicide literature. After an initial draft version was agreed upon by the SIBAT Consortium, it was reviewed by 14 patients from a psychiatric clinical research setting and by 686 members of Patients Like Me, an online patient community of individuals who self-identified as being at risk for suicide. All participants evaluated items in terms of semantic clarity, relevance of questions, and adequacy of response choices. This feedback was reviewed and revisions to the SIBAT were made. Sensitivity to change for both patient- and clinician-based measures of suicidality was evaluated on a preliminary version of the SIBAT within a longitudinal, placebo-controlled, Phase II proof-of-concept clinical trial of esketamine in 68 patients at imminent risk of suicide.

Results: The iterative SIBAT development process, involving expert clinician and patient input, has created an instrument that has high face validity for assessment of suicidal ideation, behavior, and risk. Extensive cognitive reviews by patients and clinicians suggest that it is informative to suicide assessment without being burdensome to patients. In a Phase II trial of esketamine in patients at imminent risk of suicide, the SIBAT identified significant between-group differences favoring esketamine in clinician-rated perceived risk at 4 and 24 hours after treatment ($p = 0.11$ and $p = 0.15$, respectively, based on a pre-identified statistical requirement of $p < 0.2$. Detailed results have been reported elsewhere.

Discussion: The SIBAT supports the comprehensive assessment of suicidal ideation, behavior, and risk as determined by direct input from patients and their rating clinicians. An ongoing validation program is evaluating the reliability, validity, and psychometric structure of the SIBAT. Results from this validation program will support the SIBAT's use as an instrument that efficiently documents a comprehensive clinical assessment of both imminent and long-term suicide risk in a broad range of patients.