Monday, June 22, 2020, Virtual Poster Session I

Adolescents

USE OF CIGARETTES AND E-CIGARETTES/VAPING AMONG TRANSGENDER PEOPLE: RESULTS FROM THE 2015 U.S. TRANSGENDER SURVEY

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Epidemiology
Abstract Category: Original Research
Aim: This study examined the demographic characteristics, transgender-specific variables, and discrimination experiences associated with current cigarette smoking, e-cigarette use/vaping, and dual use of cigarettes and e-cigarettes in a large sample of transgender people.
Methods: This was a secondary analysis of the 2015 U.S. Transgender Survey (N=27,715). Logistic regression models were used to estimate the adjusted odds ratios (AOR) and 95% confidence intervals (CI) of current smoking, e-cigarette use/vaping, and dual use among transgender people.
Results: Overall, 23.6% of respondents used cigarettes, 9.3% used e-cigarettes/vaping products, and 5.2% reported dual use within the past 30 days. Transgender men had increased odds (cigarettes AOR=1.34, 95% CI=1.23-1.46; e-cigarettes/vaping AOR=1.24, 95% CI-1.11-1.39; dual use AOR=1.18, 95% CI=1.01-1.38) compared to transgender women. Visually non-conforming individuals had greater odds (cigarettes AOR=1.49, 95% CI=1.35-1.65; e-cigarettes/vaping AOR=1.43, 95% CI-1.25-1.65; dual use AOR=1.81, 95% CI=1.52-2.15) compared to visually conforming individuals. Transgender people who had disclosed their transgender identity to their social networks had greater odds for cigarette smoking (AOR=1.30, 95% CI=1.17-1.45), e-cigarette use/vaping (AOR=1.30, 95% CI=1.12-1.52), and dual use (AOR=1.95, 95% CI=1.61-2.35) compared to individuals who were "out" to none or some people within their networks. Experiencing discrimination (i.e., unequal treatment, verbal harassment, and/or physical assault) significantly increased the odds for cigarette smoking, e-cigarette use/vaping, and dual use. Transgender people who experienced all three types of discrimination had two times greater odds of current cigarette smoking (AOR=2.06, 95% CI=1.79-2.37) and dual use (AOR=2.17, 95% CI=1.73-2.74) than those who had not experienced discrimination.
Conclusions: Gender identity, discrimination, visual non-conformity, and being "out" as transgender increased the odds of cigarette smoking, e-cigarette use/vaping and dual use. Healthcare professionals and tobacco cessation specialists should be cognizant of these potential stressors and assess these factors when serving transgender patients. Non-discrimination policies banning discrimination against gender identity/expression can be protective against cigarette smoking and tobacco use.

CHILDHOOD MALTREATMENT AND ALCOHOL-RELATED PROBLEMS IN YOUNG ADULTHOOD: THE ROLE OF DRINKING MOTIVES

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Behavior
Abstract Category: Original Research
Aim: Alcohol use in young adulthood remains an important public health issue. Young adults exposed to childhood maltreatment (CM) may be at increased risk as CM has been linked to alcohol problems later in life. Previous research has emphasized the importance of drinking motives in explaining the risk of alcohol problems in CM-exposed individuals. The aim of the current study was to test whether CM was linked to alcohol-related problems via its effect on drinking motives.
Methods: Young adults aged 18 - 21 (N = 208) were recruited in the community to participate in an hour-long structured interview. The participants completed self-report measures of CM, drinking motives, and alcohol-related problems. Structural equation modeling (SEM) was utilized to examine direct and indirect effects between CM, drinking motives, and alcohol-related problems, controlling for age, gender, race/ethnicity, and peer alcohol use.
Results: CM was significantly associated with coping motive (β = 0.24, p = .011), which was in turn associated with alcohol-related problems (β = 0.56, p < .001). The indirect link from CM to alcohol problems via coping motive was significant (β = 0.13, p = .021). Additionally, enhancement motive was significantly associated with alcohol-related problems (β = 0.20, p < .001).
Conclusions: Our results showed that both coping and enhancement drinking motives were associated with increased levels of alcohol-related problems. Young adults with a history of CM might develop alcohol-related problems due to a tendency to use alcohol to cope with trauma-related emotional symptoms such as emotional numbing and flashbacks. Thus, addressing drinking motives and emotional distress in CM-exposed young adults may be necessary to prevent and treat alcohol-related problems in this population effectively.

PARENTING STYLES IN OPIOID DEPENDENT ADOLESCENTS: A COMPARATIVE STUDY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Adolescent
Abstract Category: Original Research
Aim: assessment of parenting styles in adolescents diagnosed with opioid dependence and comparison with parenting styles in non-substance using adolescents.
Methods: 1. A total of 80 parent-adolescent dyads were taken. 40 in test group (opioid dependent adolescents) and 40 in control group (non-substance using adolescents)
2.   Informed consent from parent and assent from adolescents were obtained

3.   Separate interviews for adolescent and parent were conducted. They were asked to respond to specific questionnaires:

1.   Parent: Alabama Parenting Questionnaire (Parent form), Parenting style four factor questionnaire

2.   Adolescent: Adolescent Drug Abuse Diagnosis, Alabama Parenting Questionnaire (child form)

Results: Opioid dependent adolescents had significantly higher scores on dysfunctions in domains of physical health (p= 0.004), psychological health (p=0.0034) education and occupation (p=0.001), familial relations (p<0.0001), social relations (p<0.001) and in legal issues and delinquent behavior (p<0.0001) compared to controls.

Neglectful and permissive parenting styles had significant association with opioid dependence in adolescents. (OR 9.52, OR 4.45). Odds ratio of adolescents being opioid dependent in Authoritarian parenting style was 0.31 while with an authoritarian parenting style were 0.48.

Cohen's κ was calculated between responses of parents and adolescents on Alabama Parenting Questionnaire. Low κ values were seen in opioid dependent adolescents' and parental responses as compared to control dyads (p= 0.002)

Responses differed significantly in inconsistence of discipline (p<0.0001) and parental involvement (p=0.0024)

Conclusions: Parenting is an important aspect of an adolescent's development and a vital factor to be considered while assessing and managing substance use in adolescents. The Nurture component of development of substance use needs to be given its due importance in preventive as well as management paradigms of substance use in the vulnerable adolescent population.

NO GOOD TIME WITHOUT DRUGS – QUALITATIVE STUDY AMONG NIGHTLIFE VISITORS IN TBILISI, GEORGIA (COUNTRY)

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Abstract Detail: Human
Drug Category: Club/Designer Drugs
Topic: Behavior
Abstract Category: Original Research
Aim: The majority of individuals who visit nightclubs and electronic dance music festivals (NEDM events) use psychoactive substances (PS), often multiple substances, in this setting and are under the risk of serious negative health effects. To explore the patterns of PS use and related high-risk behavior in NEDM event visitors, knowledge about and source of information on PS related harms and risk reduction practices.
Methods: Qualitative study - 3 focus group discussions and 19 in-depth interviews with 30 NEDM event visitors who reported PS use at nightlife events. Data were analyzed using Nvivo-v.10 software.
Results: The most frequently used PS were MDMA/Ecstasy, amphetamine, cannabis, LSD, Ketamine, NBOMe, synthetic cannabinoids, and prescription psychotropic medications. Mixing multiple PS or PS with alcohol was common and the motivation behind was to get desired effects/feelings. PS use in nightlife settings occurred in a group of friends and was

perceived as an essential part of having a good time out. Respondents had a very low level of knowledge about and perception of risks associated with PS consumption. Knowledge about risk minimization strategies was very low or non-existent. Respondents indicated that they would be willing to use a simple mobile application on PS related effects, risks and risk prevention approaches. They also believed that NEDM venue staff should have appropriate training to deal with PS intoxication cases.

Conclusions: The lack of perceived risk preconditions, the lack of motivation to seek information on PS associated negative effects and possible risk reduction practices. Future research should focus on identifying strategies to raise the awareness of PS users in nightlife setting and to encourage them employing health protection strategies. Using social network infrastructure (friends) can be thought as one of potentially beneficial approach.

DRINKING PROBLEMS AS A PREDICTOR FOR PRO-ALCOHOL CONTENT ON SOCIAL MEDIA SITE IN YOUNG ADULTS

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Epidemiology
Abstract Category: Original Research

Aim: The online social media web sites (e.g., Facebook) have been recognized as an environment to express self and interact with friends, which is particularly true for young people. This study aims to explore prospective association between drinking behaviors with the occurrence of pro-alcohol content on social media platform (i.e., Facebook) in young adulthood.

Methods: The data were ascertained from a sub-cohort of 393 participants participating in an on-going longitudinal study from late childhood since 2006 in Taipei. Information concerning individual sociodemographic characteristics, alcohol drinking behaviors (e.g., drinking problem, assessed by the Young Adult Alcohol Problems Screening Test [YAAPST]) and scenes (i.e., solitary or social drinking) from childhood (12-year of age) and emerging adulthood (18~20 year-old). Upon positive consent, we ascertained alcohol-related content (e.g., message and image) the youngsters shared, posted, and liked on Facebook in the period of December 3rd 2015 and January 3rd 2016 (20~21 year-old). Logistic regression analyses were performed to evaluate association estimates.

Results: Nearly 7% of subjects have posted, shared, or liked at least one pro-alcohol content on their Facebook in the month preceding 2016 New Year Eve. Over one half have initiated alcohol drinking in late childhood; 60% had social drinking in last drinking occasion, 39.7% drank on a monthly basis, 10.4% have binge drinking, and 42% reported having at least one alcohol-related problem (e.g., hangover) in emerging adulthood. The analyses indicated that having at least one drinking problem was significantly predictive for having alcohol-related content on social media a year later (OR=2.95, 95% CI=1.29-6.74). Monthly drinking, binge drinking, and social drinking may moderately increase the odds of pro-alcohol content on Facebook by 100%, 108%, and 118%, respectively.

Conclusions: The appearance of pro-alcohol content on the social media platform may be partly explained by one's experienced alcohol-related problems.

LATENT CLASS ANALYSIS OF RISK FACTOR PROFILES AND RECENT CANNABIS USE BY 8TH GRADERS: THE IMPORTANCE OF CONSIDERING CO-OCCURRING RISK FACTORS IN A TIME OF CHANGING SOCIETAL NORMS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research
Aim: This study aims to examine associations between patterns of co-occurring risk factors and early initiation of cannabis use. Changes in societal perceptions regarding cannabis use, as indicated by voter-approved liberalized recreational cannabis policies, have the potential to alter long-observed relationships between risk factors for youth cannabis use and use.
Methods: This study utilized 8th grade data from Washington State's 2018 Healthy Youth Survey (HYS) (n=21,063). The HYS risk/protective factor scales were adopted from previously validated measures. Latent Gold was used to assess for discrete patterns of risk factors (cannabis specific factors: acceptance of use, perceived availability, perceived harm, use by a close friend; non-cannabis specific: poor family management, academic failure). Individual class membership probabilities were exported to Stata to perform logistic regression analyses examining associations between risk factors, class membership, and recent cannabis use.
Results: Model fit statistics suggested a 5-class model with the following classes; 1) low risk, 2) high risk, 3) low, but high probability of poor family management and academic failure, 4) moderate risk marked by a low probability of perceived harm, 5) moderate risk marked by a high probability of peer use. Logistic regression supported a direct association between each risk factor and recent cannabis use (adjusted OR range=2.0 – 6.0, p-values <0.001). All classes had increased odds of recent use compared to the "low risk" class. The largest effect was a 200+ fold increased odds of recent cannabis use for the "high risk" class (OR= 207.3), and the smallest effect was for the "low, but high probability of poor family management, and academic failure" class (OR= 3.8, p-value<0.001).
Conclusions: While tends pertaining to perceived accessibility, perceived risk, and personal acceptance of use may have shifted in light of recent policies, these factors, particularly in combination, are salient predictors of early cannabis use.

"I WAS TAKING THE SUBOXONE EVEN THOUGH I HATED IT…": A QUALITATIVE EXPLORATION OF STIGMA AND EXPERIENCES RELATED TO TAKING MEDICATIONS FOR OPIOID USE DISORDERS AMONG YOUNG ADULTS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: To explore the experiences and attitudes of young adults (YAs) treated with medications for opioid use disorder (MOUD).

Methods: We used qualitative methods to conduct semi-structured interviews with YAs (ages 18-29) in care for opioid use disorder. All interviews were audio-recorded and transcribed. We developed codes around four dimensions: 1) experiences with MOUD; 2) MOUD treatment decision-making; 3) beliefs about MOUD; and 4) impact of beliefs on treatment engagement. Interviews were double-coded and analyzed to build themes around these dimensions.

Results: We enrolled nineteen YAs, average age was 26 years. Seventy-four percent identified as Caucasian and 37% as female. We identified four themes. First, all YAs described ambivalence about taking MOUD. Many reported benefits of MOUD such as a decrease in cravings, while also expressing a desire to discontinue treatment with MOUD. Second, YAs cited complicated and diverse reasons for their ambivalence, including treatment with MOUD meant they were "not completely sober", stigma related to receiving MOUD, and competing interests such as employment and childcare. The third theme was that YAs experienced stigma related to MOUD from numerous sources, including treatment providers, family members, peers, self-help groups, and social media. This was stigma directly related to MOUD and distinct from having an opioid use disorder. The fourth theme was that support systems and social networks, both medical and nonmedical, influenced treatment decision-making. Oftentimes, individuals from these networks offered conflicting advice.

Conclusions: Stigma explains some but not all of the ambivalence that YAs experience toward MOUD. Many voices, including peers and family, influence YAs treated with MOUD and medical providers may not be the most influential voices. Efforts to engage and retain YAs in MOUD care should reflect the diversity of factors that may impact their decision-making.

THE IMPACT OF GROUP-BASED COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA (GCBT-I) ON SUD TREATMENT RETENTION IN RESIDENTIAL SETTING FOR HOMELESS PERSONS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Treatment
Abstract Category: Original Research

Aim: Sleep disturbances such as insomnia are common in substance use disorder (SUD) populations and are a common path to relapse and treatment cessation. These problems are the result of either withdrawal or as a primary sleep disorder. Cognitive-behavioral therapy for insomnia (CBT-I) has been shown to be an effective treatment for sleep problems in medical and psychiatric populations. The present study sought to characterize the effectiveness of group-based CBT-I therapy as a novel delivery model to address sleep problems in a residential-based SUD clinic.

Methods: Upon entering the residential SUD outpatient clinic, clients were screened for insomnia. If screened positive for insomnia, clients were then randomized into treatment as usual (TAU) or treatment that included an 8-week period of group-based CBT-I treatment groups. a CBT-I treatment group. 90 and 180-day treatment retention data is present here for both groups.

Results: Participants in the CBT-I treatment group (N=10) had a 60% 90-day retention rate and 30%180-day retention rate, while participants in the TAU group (N=11) group had retention rates of 36% and 10%, respectively (P=.258).

Conclusions: The present data shows promise that CBT-I may increase treatment retention in SUD populations within a residential SUD treatment setting. While the potential clinical significance of these retention rates is present, higher-powered studies are needed to determine the true statistical significance. It will also be important to report on the changes in sleep quality for these individuals and the implementation challenges of research in this setting.

A RESEARCH PROGRAM TO ADDRESS PREVENTION OF OPIOID MISUSE IN ADOLESCENTS: DEVELOPMENT, EVALUATION, AND IMPLEMENTATION OF A VIDEOGAME INTERVENTION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Adolescent
Abstract Category: Program Descriptions
Aim: As part of the NIH Helping to End Addiction Long-term (HEAL) Initiative, the Yale play2PREVENT Lab will develop, evaluate, and design implementation strategies for a videogame intervention PlaySmart, targeting opioid misuse prevention in adolescents.

Methods: This study will be conducted over five years with the first two years dedicated to the development of the game intervention and implementation strategies (UG3), both will be tested during the subsequent three years (UH3). This program focuses on the two years of development activities (UG3).

To inform the game development, we will conduct 8 focus groups with 5 adolescents (N=40), aged 16-19, and 20 structured interviews with individuals, aged 16-25 who are currently receiving treatment for opioid use disorder. We will also conduct focus groups with youth and affiliates of our national partner, the School-Based Health Alliance (SBHA), at their national convention during each of the 2 years of development. During these focus groups, we will collect feedback on the game intervention and conduct discussions regarding potential implementation strategies for the nearly 2500 school-based health centers nationally.

Through this formative work and in a highly iterative process working with our game development partners Schell Games, adolescents and other key stakeholders, we will produce the videogame intervention and pilot it to evaluate feasibility, acceptability, and usability. At the conclusion of the UG3 period, we will have a fully-piloted game intervention. We will launch a RCT, enrolling 532 adolescents, aged 16-19 years, from 10 local high schools with SBHCs to evaluate the efficacy of the intervention (UH3), and preliminary plans for subsequent implementation which will be tested during the UH3 period.

Conclusions: At the end of this two-year research program, we will have developed and piloted an evidence-informed videogame intervention as well as implementation strategies to be tested in the following three-year research program period.

COLLEGE HEALTH PROVIDERS' KNOWLEDGE AND CONFIDENCE IN ADDRESSING COLLEGE STUDENTS' VAPING

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Treatment
Abstract Category: Original Research
Aim: There has been a call for health providers to increase their awareness and confidence when discussing vaping with college students. This may be particularly relevant given the rapidly changing vape landscape. Vaping nicotine or cannabis products is popular, and rates of vaping are typically higher among younger adults compared to mid-aged or older adults. Therefore, the aim of this study was to examine the knowledge and confidence of college healthcare providers regarding vaping among college students.
Methods: Pilot data was collected from 51 college health providers located at 26 colleges in the 64-campus State University of New York (SUNY) system. Knowledge of vaping was assessed using a number of items, including, "Do you find students on your campus use electronic cigarettes more often for vaping nicotine or for vaping cannabis?" Response options were: nicotine, cannabis, don't know. Descriptive statistics were used to characterize the study findings.
Results: College health providers agree (76%) that vaping is a problem on their campus. They largely felt knowledgeable (80.9%) and confident (87.8%) in discussing vaping. However, the majority (67%) of these health providers reported they "don't know" what product college students are vaping. Importantly, most indicate learning about vaping is a priority area (74%), and indicate they have time to learn more about vaping (82%).
Conclusions: Overall, findings indicate a potential disconnect between providers' perceived and actual knowledge of college student vaping. Understanding what products students are using, whether alone or in combination, will help to tailor messaging to students and inform prevention and intervention initiatives. These findings, as a whole, demonstrate areas of opportunity to assist college health providers in comprehensively addressing vaping with their college student populations. Future research is needed to better understand from where health providers are obtaining their knowledge of vaping, and if this knowledge is, in fact, accurate.

CO-USE OF E-CIGARETTES AND OTHER SUBSTANCES AMONG US YOUNG ADULTS

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Epidemiology
Abstract Category: Original Research
Aim: Previous studies indicated the positive association between e-cigarette and other substance use (e.g., alcohol, marijuana) among US adults. As highlighted in the US Surgeon General's report, e-cigarette use among young people is rapidly increasing and may put them at risk of harmful health outcomes due to its co-use with other substances. In the present study,

we examined the co-use of e-cigarettes and other substances among young adults using a nationally representative dataset.

Methods: Young adults (ages 18-24; both sexes; N=8,437) at Wave 3 (2015-2016) of the Population Assessment of Tobacco and Health (PATH) Study were included in the analyses. In a series of multiple logistic regression analyses, e-cigarette use predicted other substance use, including cigarette smoking, alcohol, marijuana, painkillers/sedatives/tranquilizers, cocaine, and stimulants (methamphetamine/speed). We also controlled demographic and individual characteristics, such as sex, sexual orientation, race/ethnicity, other tobacco product use (i.e., cigar, hookah, and smokeless or snus tobacco), education, income level and GAIN-SS scores (substance use problem, externalizing/internalizing tendencies).

Results: In the study sample, 1,014 young adults (weighted proportion: 10.7%) were current e-cigarette users. E-cigarette users were more likely to concurrently use alcohol (Adjusted OR [aOR] = 1.37), cigarette (aOR = 3.23), and marijuana (aOR = 1.82). In addition, e-cigarette users are more likely to be poly-substance users (vs. single users) (aOR = 2.09). Among e-cigarette users who currently use other substances (n=884), the most commonly used combinations are "alcohol only" (weighted proportion: 16.8%), followed by "alcohol, marijuana, and cigarettes" (16.3%) and "alcohol and cigarettes" (15.9%).

Conclusions: This study highlights the high prevalence of the co-use of e-cigarettes and other substances. Current findings suggest that co-use with other substances should be addressed in health promotion programs for e-cigarette users.

REVIEW OF CURRENT TREATMENTS FOR YOUTH WITH OPIOID USE DISORDER (OUD)

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Adolescent
Abstract Category: Literature Review
Aim: Over the years, an increasing number of adolescent and young adults (collectively referred to as youth) have been dying due to illicit drug use. For instance, in Canada, illicit drug toxicity death rates per 100,000 in adolescents (10 to 18 years old) rose from 1.1 in 2015 to 4.0 in 2017, and from 16.6 to 40.5 in young adults (19 to 29 years old). Similarly, in the US, drug-induced death rates per 100,000 in youth rose from 9.7 in 2015 to 12.6 in 2017.

The BC Guideline and the National Institute on Drug Abuse (NIDA) part of the National Institute of Health for Clinical Management of adolescent OUD, strongly endorses the use of OAT as the preferred first-line treatment because of its associated retention in treatment, sustained abstinence from opioid use, and reduced risk of mortality. In addition, it also considers withdrawal management strategies alone ineffective, since the retention rates are low when used as a standalone option.

Unfortunately, these adult-oriented suggestions such as OAT are often not being applied and tailored to younger individuals. Similarly, many regulations prevent adult substitution treatment and harm reduction programs from treating youth. As a result, detoxification and abstinence-based therapies are the most common approaches for youth currently, and as mentioned above, these programs often lead to low retention rates and high relapse rates without proper support and guidance. Our narrative review will summarize what has been shown to work with OUD in youth.

Methods: Our narrative review will summarize what has been shown to work with OUD in youth using 4 broad themes: substitution treatment, abstinence-based therapies, harm reduction programs and psychosocial interventions. The articles we sought summarized treatment and approaches for adolescent who use opioids and who are susceptible for opioid overdose. We obtained published scientific literature and data for this narrative review using PubMed. We used the following MeSH term combinations to obtain relevant literature: "youth" or "adolescent" or "high school" or "young" and "abuse" or "overdose" or "depend" or "addict" or "intoxication" and "intervention" or "treat" or "outpatient" or "inpatient" or "emergency" or "clinic" or "care", "approach" or "mode" or "therapy" or "psychosocial" or "behavioral" or "detoxification" or "strategies" or "substitution" or "cognitive" or "withdrawal" and "opioid" or "heroin". This search provided us with 1527 references. Using these terms on PubMed, we found 1527 publications. After screening the titles and abstract, 110 papers relevant to opioid use disorder treatment in adolescents were found. In these 110 papers, 19 were harm reduction, 23 were abstinence-based treatment, 43 were substitution, 15 were psychosocial, and lastly 10 were reviews.

Results: The literature reflects the reality of the situation: abstinence treatment (detoxification specifically) is the major focus for treating opioid use disorder in youth. However, there is little-to-no follow-up on these young patients and little evidence on measures that guide them back into their social or familial contexts. Little research has been done on abstinence-based therapeutic approaches, but a limited number of studies including psychosocial interventions have proved to be efficient. On the opposing side, OAT is associated with positive treatment outcomes, such as abstinence from illicit substances and a lower incidence of HCV. Continued treatment with buprenorphine-naloxone has been shown to have better outcomes and be more cost effective than short-term detoxification, but retention in these substitution treatments remain low, and barriers to accessing treatment are pervasive.

Conclusions: From our narrative review, we conclude that there is a need for more evidence-based studies in order to test and develop a more holistic approach for better retention and lower relapse rates in youth with opioid use disorder. We suggest a treatment regimen that begins with OAT and eventually transitions into abstinence-based programs, with psychosocial and harm reduction interventions throughout.

COMPARING ALCOHOL AND DRUG USE OF COLLEGE STUDENTS DURING SPRING BREAK AND AT ELECTRONIC MUSIC EVENTS

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Abstract Detail: Human
Drug Category: Club/Designer Drugs
Topic: Prevention
Abstract Category: Original Research

Aim: Electronic Music Events (EME), e.g., raves or festivals, often have extreme substance use and related harms. Prevention for events like Spring Break are effective. However, there is little evidence to inform adaptations of prevention interventions for EME, e.g., comparing alcohol, marijuana, or club drug use during Spring Break and EME. We hypothesized greater alcohol use, greater marijuana use, lower club drug use during Spring Break than Music Week, with many raves and a large 3-day festival. We also hypothesized more students would binge drink and use marijuana, and fewer use club drugs, during Spring Break than Music Week.

Methods: 200 undergraduate men and women retrospectively reported daily use of alcohol, marijuana, and club drugs for two 9-day periods, i.e., including two weekends, with a modified Daily Drinking Questionnaire. Paired-sample t-tests and McNemar's tests compared use with continuous and binary variables, respectively, across Spring Break and EME Week. Week was the IV with six DV; three continuous, (a) drinks of alcohol, (b) days using marijuana, and (c) days using club drugs; and three binary, proportion of students with (d) one or more binge drinking episodes, (e) one or more occasions using marijuana, and (f) one or more occasions using club drugs.

Results: During Spring Break compared to EME Week, there was more alcohol drinks, $t(184) = 8.21$, $p < .001$, more marijuana days, $t(199) = 3.24$, $p = .001$, similar club drug days, $t(198) = 1.68$, $p = .094$; more students binge drinking, McNemar $p < .001$, more using marijuana, McNemar $p = .024$, but fewer using club drugs, McNemar $p < .035$.

Conclusions: EME had more students using club drug than Spring Break. Adaptations of event-specific prevention for EME should add content specific to club drugs, e.g., education about effects and risks. Future research should compare single EME to events like 21st birthday.

LONGITUDINAL TRANSITIONS FROM PRESCRIPTION OPIOIDS TO HEROIN AMONG US ADOLESCENTS FOLLOWED INTO ADULTHOOD

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Adolescent
Abstract Category: Original Research

Aim: To examine the longitudinal relationships between adolescents' prescription opioid use and misuse and subsequent heroin use through age 35.

Methods: Nationally representative sample of U.S. high school seniors (weighted n=8,373) from 21 annual independent cohorts (1976-1996) were surveyed via self-administered questionnaires and followed from age 18 to age 35 as part of the Monitoring the Future Panel study. We excluded adolescents who used heroin in 12th grade and created the following five mutually exclusive subgroups based on survey responses in 12th grade: no lifetime exposure to prescription opioids (population controls), medical prescription opioid use without a history of nonmedical misuse, medical use after nonmedical misuse, nonmedical misuse after medical use, and nonmedical misuse only. These subgroups were compared on their risk for heroin use through age 35 controlling for relevant covariates.

Results: Nearly one in every five adolescents who reported medical prescription opioid use after initiating nonmedical prescription opioid misuse transitioned to heroin use over a 17-year

period through age 35. Adolescents who reported medical prescription opioid use without a history of nonmedical misuse did not differ in the odds of transitioning to heroin use through age 35 relative to population controls. Adolescents who reported medical prescription opioid use after initiating nonmedical misuse had over seven times greater odds of transitioning to heroin use through age 35 relative to population controls (AOR=7.8, 95% CI=3.8-16.3).

Conclusions: We conclude there is a substantial risk for adulthood heroin use among teens who were prescribed opioids after already initiating nonmedical prescription opioid misuse. This is the first national prospective study to examine the relationships between U.S. adolescents' prescription opioid use and misuse and longitudinal transitions to adulthood heroin use. These findings reinforce the critical role of drug screening, especially when prescribing opioids, to detect high-risk individuals who would benefit from early intervention to reduce later heroin use.

Alcohol

PROFILES OF PSYCHOSOCIAL RISK AND PROTECTIVE FACTORS AND THEIR ASSOCIATIONS WITH ALCOHOL USE AND SMOKING IN BLACK ADULTS

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Epidemiology
Abstract Category: Original Research

Aim: To identify prototypical combinations of substance use-related psychosocial risk and protective factors distinguishing subgroups of Black adults, and the associations of subgroups with frequency of alcohol use and prevalence of regular smoking.

Methods: Data represented 4,462 participants of the National Survey of American Life (29% Afro-Caribbean, 71% African American; Median age=38 years; 29.63% female). Ten indicators collectively measuring social support (neighborhood safety and cohesion, religious involvement, support from family, friends, religious community), social demands (from family, religious community) and adversity (financial difficulties, racial discrimination) were submitted to latent profile analysis, hypothesizing 3-5 subgroups. Using multiple-groups regression modeling, resulting subgroups were compared on alcohol use and regular smoking, accounting for probability of subgroup membership and subgroup-associated demographic characteristics.

Results: Four subgroups were identified by standard model-fit criteria. In addition to high-risk (low-support/high-adversity) and low-risk (high-support/low-adversity) extremes, a third subgroup was characterized by both high support/high demands and a fourth by low support/low demands, each paired with low/moderate adversity. Younger participants were observed in the two low-support subgroups, males and Afro-Caribbeans were over-represented in the low-support/low-demand subgroup, and family substance use history was most prevalent in the high-risk subgroup. Relative to the low-risk subgroup, both low-support subgroups had significantly higher frequency of alcohol use (Class 1=.995 vs. Class 3=1.869, p<.01; Class 4=2.723, p<.01). Only the low-support/high-adversity group had higher rates of regular smoking (Class-1 intercept=-1.769 vs. Class-4 intercept=0.058; p=.04)

Conclusions: In this all-Black sample, variation in the pairing of substance use-related risk and protective factors beyond a simple dichotomy of high- and low-liability subgroups was revealed. Two groups reporting high-level social support were distinguished by low vs. high social demands; two groups reporting low-level social support were distinguished by levels of adversity. Substance use models suggested psychosocial protective factors are more predictive of drinking behaviors than psychosocial risk factors. The reverse was true for regular smoking.

IMPACT OF ADVANCED LIVER FIBROSIS ON THE MARKERS OF, MONOCYTE ACTIVATION, MICROBIAL TRANSLOCATION, AND INFLAMMATION IN PATIENTS ADMITTED FOR HOSPITAL TREATMENT OF ALCOHOL USE DISORDER

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Epidemiology
Abstract Category: Original Research
Aim: To assess the impact of advanced liver fibrosis (ALF) on the levels of markers of monocyte activation (CD163 and sCD14), microbial translocation [lipopolysaccharide (LPS) and LPS binding protein (LBP)] and inflammation (Interleukin (IL)-6 and IL-10) in patients admitted for hospital treatment of alcohol use disorder (AUD) between 2013 and 2019.
Methods: Cross sectional study performed at two tertiary hospitals in Barcelona, Spain. No patient had decompensated liver disease. Clinical and laboratory parameters were obtained at admission. ALF was defined as a FIB-4 value >3.25. We performed bivariate analyses to detect associations between ALF and marker plasma levels.
Results: 384 patients (75.8% male) were included. Median age was 50 years (interquartile range [IQR]: 43-75) and median BMI was 25.6 (IQR: 22.4-29.2). Patients drank a median of 140 grams of alcohol daily (IQR: 100-220) and had a median duration of AUD of 20 years (IQR: 10-27); 11.9% had hepatitis C virus (HCV) infection and 26.4% had ALF.

The median values for CD163, sCD14, LPS, LPS, LBP, IL-6 and IL-10 were 753 ng/mL (interquartile range [IQR]: 470-1000), 1.68×10^6 pg/mL (IQR: 1.30×10^6-1.98×10^6), 1048 pg/mL (IQR: 412-2217), 22 ng/mL (IQR: 11-45.4), 3.26 pg/mL (IQR: 0.87-8.05) and 0.68 pg/mL (IQR: 0.02-2.38), respectively.

Patients with ALF had higher duration of AUD (22.8 vs. 17.5 years, p<0.01) and higher prevalence of HCV infection (23.6 vs. 9.3%, p<0.01).

Patients with ALF had higher mean values of CD163 (944 vs. 638 ng/mL, p<0.01), sCD14 (1.8×10^6 vs. 1.6×10^6 pg/mL, p<0.01), LBP (55 vs. 35.4 pg/mL, p=0.04), IL-6 (16.9 vs. 5.9 pg/mL, p=0.04), and IL-10 (2.5 vs. 1.4 pg/mL, p<0.01); and lower mean values of LPS (1272 vs. 1975 p=0.02).

Conclusions: In AUD patients with no decompensated liver disease, the presence of ALF is associated with a distinct pattern of marker levels, consistent with increased monocyte activation, microbial translocation and inflammation.

MULTIPLE SOURCES OF INFLUENCE ASSOCIATED WITH BINGE DRINKING AMONG YOUTH

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Adolescent
Abstract Category: Original Research
Aim: The purpose of this study was to determine how the interaction of multiple perceived influences on alcohol use are associated with alcohol consumption patterns among U.S. youth.
Methods: The 2017 National Survey on Drug Use and Health (NSDUH) was used to identify 1,405 youth, aged 12-17, who have consumed alcohol in the last month. Sources of influence related to alcohol consumption were: parental, non-familial close social network, and self. Influences were either tolerant or intolerant towards alcohol use. Two alcohol consumption patterns were identified among the sample; at least 1 binge drinking episode or only moderate alcohol consumption in the past 30 days. Logistic regression was used to determine the likelihood of binge drinking per combinations of sources of influences.
Results: Over half the sample reported at least one binge drinking episode within the past 30 days. Each source of influence individually was associated with binge drinking patterns. Further, individuals were less likely to binge drink if their close social network was non-permissive of that behavior, regardless of their parental and self-assessment. Additionally, youth were more likely to participate in binge drinking if their beliefs were opposite of their parents, regardless of tolerance.
Conclusions: Results from this study highlight the importance and nuance of perceived influence interactions on alcohol consumption patterns among youth. Beyond personal belief, this study details how specific influence interactions differ and are likely to be associated with binge drinking. More effective interventions need to be developed that account for, and targets, multiple levels of influence on youth alcohol behavior.

PHARMACOTHERAPY PRESCRIBING PATTERNS IN ALCOHOL USE DISORDER (AUD) FOR PATIENTS ENROLLED IN THE RIAHEALTH TREATMENT PROGRAM (RHTP)

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Treatment
Abstract Category: Original Research
Aim: Despite many safe and effective AUD pharmacotherapies little is known about anti-alcohol prescribing practices. For most diseases, combination pharmacotherapies are superior to monotherapy yet there are few reports on the use of rational drug combinations in AUD. Here we report the rate, duration and clinical outcomes for anti-alcohol drugs prescribed to patients treated for AUD by RiaHealth.
Methods: The RHTP is an AUD telehealth treatment program deployed on smartphones. Alcohol use is quantified with 1-2X/day breath alcohol concentrations (BAC) and patients are

treated with medications and coaching. Prescription data were obtained through the Ria application and EHR interfaces which tracks all prescribing to Ria patients. Prescribing of Naltrexone (NTX), acamprosate (ACAM), gabapentin (GABA), baclofen (BAC), and topiramate (TOP) were assessed.

Results: From 1/2017-9/2019 816 Ria patients were prescribed anti-AUD meds. At treatment initiation NTX was prescribed to 83.1% followed by GABA (7.6%), NTX-GABA (4.0%), ACAM (2.57%) Baclofen (0.98%) and TOP (0.86%). At 6 months NTX has decreased to 67.61% and NTX-GABA had increased to 12.68%, ACAM decreased to 2.35%, Baclofen increased to 2.35% and TOP increased to 1.41%. At 6 months, 47% of patients remain in treatment and mean BAC declined from 0.08 to 0.03 g/L (66%). Non-drinking days increased from 1.8 to 3.9 days/week.

Conclusions: Medication management in AUD is effective, safe and well tolerated and can be improved with telehealth. In the Ria cohort NTX is the most commonly prescribed monotherapy and NTX-GABA is the most commonly prescribed combination. NTX-GABA combinations appear safe and well tolerated but more research is needed to assess therapeutic switching and synergy.

FROM VALIDATION TO IMPLEMENTATION OF A REMOTE ALCOHOL MONITORING PLATFORM TO FACILITATE ABSTINENCE REINFORCEMENT

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Treatment
Abstract Category: Original Research

Aim: The delivery of monetary incentives contingent on verified abstinence is an effective treatment for drug and alcohol use disorders, but verification of abstinence and effective incentive delivery mechanisms have prevented this approach from widespread use for alcohol use disorder.

Methods: We have now completed two randomized trials to validate a remotely delivered abstinence incentive intervention for adults with alcohol use disorder. One of these trials required participants to deposit $75 of their own money to access the treatment, and one had no deposit requirement. Two additional ongoing trials are evaluating the implementation of this approach for 1) abstinence initiation in underserved adults recruited from the community, and 2) relapse prevention following inpatient alcohol detoxification. Each trial involved no in-person contact during the treatment phase and used mobile technologies to facilitate treatment delivery, including a custom smartphone application in the later trials.

Results: Both validation studies indicated that this approach was highly effective with abstinence rates in the treatment groups approximately 40% higher than the control groups (p values < 0.001) and little evidence of relapse following treatment termination. Additionally, breathalyzer collection adherence rates were over 95% and participant ratings of acceptability were high. Effectiveness results were not impacted by the participant-funded deposit requirement, but this deposit requirement did prevent some lower income participants from accessing the study. Preliminary results from our ongoing trials include the successful integration of this approach with a custom smartphone application that interfaces with participants, monitors use, and verifies participant identity.

Conclusions: These results support the efficacy, acceptability, and feasibility of this approach for remote initiation and near-term maintenance of abstinence from alcohol, and our newly developed smartphone application provides a platform for delivering this treatment approach to underserved individuals.

CAN A SINGLE QUESTION ABOUT PROBLEM DRINKING IDENTIFY INDIVIDUALS WITH A DSM-5 DIAGNOSIS OF ALCOHOL USE DISORDER?

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: While Alcohol Use Disorder (AUD) is common in patients receiving opioid agonist treatment, it often goes undetected, increasing risk for adverse health outcomes (Klimas et al, 2015). Strategies are needed to promote routine screening for alcohol misuse in persons with other SUD. The present study examined whether a single self-report question about ever having a problem with alcohol can be used to identify individuals likely to meet DSM-5 criteria for AUD in patients attending either opioid agonist or psychosocial SUD treatment programs.
Methods: Subjects (N=665) were clients enrolled in SUD treatment who participated in a genome-wide association study of AUD. All provided informed consent and completed a 20-min anonymous survey about alcohol and other drug use as well as mental health and personality measures. The present study examined the ability of a question about problem drinking (PD) to identify individuals with mild, moderate and severe AUD (lifetime). Data analyses focused on sensitivity, specificity, likelihood ratios and area under the receiver operating curve (AUC).
Results: Participants were 44.1% female and 61.3% were White. For AUD across all severity levels (2+ criteria), PD item sensitivity was 87% and specificity was 91%, with AUC (0.89, p<0.001). For severe AUD (6+ criteria), PD item sensitivity was 96% and specificity of 76%, with AUD (0.86, p<0.001). .
Conclusions: The 1 item PD screener displayed high sensitivity and specificity for detection of AUD, By reducing barriers to implementation, it has the potential to improve patient health through earlier detection of co-morbid AUD in clients enrolled in MAT or psychosocial SUD treatment.

ALCOHOL MIXED WITH ENERGY DRINK USE AND ANTISOCIAL PERSONALITY DISORDER TRAITS AMONG INDIVIDUALS WITH ALCOHOL USE DISORDER

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Abstract Detail: Human
Drug Category: Other, Caffeine
Topic: Behavior
Abstract Category: Original Research

Aim: Compared to those consuming alcohol by itself, those using alcohol mixed with energy drinks (AMED) are more likely to report substance use/problems and risk-taking behaviors, such as driving while impaired (e.g., Brache et al., 2012). Individuals with Alcohol Use Disorder (AUD) are at increased likelihood of having Antisocial Personality Disorder (ASPD). Little is known about the role of AMED use in this comorbidity. The present study examined AMED use and ASPD symptoms in a sample of individuals with lifetime severe AUD.

Methods: Subjects (N=899) were individuals participating in a genome-wide association study of severe AUD who completed a 20-minute computer-administered survey. They were recruited from addiction treatment programs, Faces & Voices of Recovery, and ResearchMatch.org. Survey domains included alcohol and other drug use, mental health symptoms, and personality measures. Chi-square analyses compared ASPD behaviors in those who reported lifetime regular AMED use (>1/week; AMED+) to those with no or infrequent AMED use (<1/week; non-AMED).

Results: Demographically, the sample was predominantly female (54.1%) and white/Caucasian (81.9%), with almost half (46.9%) employed full-time. Males were more likely than females to be AMED+ users (13.5% vs 9%, p=.03). No difference was found for AMED+ use by race. Compared to non-AMED users, AMED+ users were more likely to endorse 14 of the 17 ASPD symptoms assessed including: conning someone (34.1% vs 63.3%); putting themselves/others in danger (44.7% vs 82.7%); and intentionally injuring someone (10.3% vs 24.5%) (all p<.05).

Conclusions: AMED+ users were more likely to endorse the majority of ASPD traits than AMED users. AMED+ is a potentially important moderator of ASPD that may be useful for tailoring addiction treatment and prevention. Future research will seek to better understand the relationship between AMED use and conditions/risky behaviors that complicate the clinical profile of those with AUD.

Behavior

BENZODIAZEPINE CUE REACTIVITY: A PRELIMINARY INVESTIGATION

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Abstract Detail: Human
Drug Category: Sedative-Hypnotics
Topic: Behavior
Abstract Category: Original Research

Aim: Benzodiazepines are among the most commonly misused drugs. However, they have been the subject of limited research, in part because of data suggesting that their abuse liability is lower than for many other substances. Nonetheless, the public health harms of benzodiazepine misuse (e.g., overdose) are growing, and research on benzodiazepine misuse is needed. People with substance use disorders consistently report increases in craving following presentation of substance-related cues, such as objects or images. Although this finding has been replicated across many substance types (e.g. alcohol, cocaine, opioids), no published studies have examined whether people exhibit craving to benzodiazepine-specific cues.

Methods: In this preliminary study, a sample of adults with substance use disorders receiving treatment (N=22) were shown a series of images of benzodiazepines (e.g., pill bottles, Xanax

bars) and neutral images and were asked to rate their craving, anxiety, and the degree to which the image reminded them of misusing benzodiazepines (i.e., salience) on a 0-10 scale. Image order was randomized and counterbalanced to minimize order effects.

Results: Compared to neutral images, participants reported significantly higher craving (t=5.86. p<.001) and anxiety in response to benzodiazepine cues (t=5.87, p<.001). Cues were rated as highly salient (averaging 6.7 out of 10). The magnitude of the craving effect was comparable to that reported in a prior study (McHugh et al., 2016; Am J Addict) using the same paradigm in people with opioid use disorder (5.94 vs. 6.51 out of 10 for benzodiazepines and opioids, respectively).

Conclusions: Benzodiazepine-related cues elicit a strong craving and anxiety response in people who misuse benzodiazepines. Important next steps include research to clarify whether the mechanisms underlying this effect are similar to those of other substances.

EXAMINING THE VALIDITY OF SOCIAL MEDIA ADDICTION: CONNECTIONS WITH SUBSTANCE USE AND OTHER MENTAL DISORDERS USING QUESTIONNAIRES AND QEEG

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Abstract Detail: Human
Drug Category: Other, Behavioral Addiction
Topic: Behavior
Abstract Category: Original Research

Aim: There is ongoing debate whether problematic social media use (PSMU) should be classified as an addiction in the DSM. To clarify whether PSMU assessed with clinical measures of traditional DSM-5 addiction symptoms holds value, we examined the relationship between PSMU and mental health (including substance use) using questionnaires and QEEG.

Methods: Ninety-six male and female undergraduates filled out questionnaires including measures of mental health, substance use, and reward responsiveness. Participants completed the Social Media Disorder Scale, which examines nine categories of PSMU use consistent with DSM criteria for substance use disorder. Participants were placed in high or low PSMU groups (>4 vs. <5 categories endorsed). Fourteen participants (6 low and 8 high PSMU) completed a resting state 10-electrode QEEG assessment. QEEG measurements of mean absolute powers were used for analysis. Researchers used t-tests and chi-square analyses to determine differences between high and low PSMU.

Results: The high PSMU group had higher scores in depression (t=0.69, p<0.05), PSS (t=2.10, p<0.05), worry (t=3.64, p<0.05), social anxiety (t=2.18, p<0.05), and the behavioral inhibition system of the BIS/BAS (t=3.18, p<0.001). There was no differences between PSMU groups on any measure of substance use or substance use disorder (p>0.20). QEEG analysis revealed that the high PSMU group had lower beta power than low PSMU group. This effect was seen in the left frontal lobe (t=-3.2, p<0.05) and left central sulcus (t=-2.5, p<0.05). This effect was seen at a trend level in the midline of the frontal lobe (t=-2.0, p<0.1), and left temporal lobe (t=-2.0, p<0.1).

Conclusions: PSMU was not associated with substance use, but was associated with a variety of mental health issues. In contrast, high PSMU demonstrated beta wave forms consistent with what is found in alcohol use disorder, but opposite of depression. These data suggest PSMU may represent a distinct issue separate from substance use disorders.

BEHAVIOR CHAINS REVEAL COMMON ASSOCIATIVE MECHANISMS ACROSS RATS AND HUMANS

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Behavior
Abstract Category: Original Research

Aim: Behavior occurs in "chains" of responses performed in a sequence leading to a reinforcing outcome. For example, someone that smokes cigarettes while driving in their car must also procure cigarettes from a store. Effective behavior change will require addressing each link of the chain. Rat studies suggest that chained behaviors form direct and specific associations. The present experiment developed a new method to study chained behaviors in human participants.

Methods: Undergraduate participants (23 female, 4 male; 18-26 years old) completed a computer task that involved learning to press a keyboard button (R) when a shape on the screen changed color in order to earn points. A within-subject design arranged three R1-R2 chains (R1-R2, R3-R4, and R5-R6) across six keyboard buttons. On a chain trial, an R1 shape turned blue and presses on the correct button turned the shape back to yellow and turned a second, specific R2 shape blue. When an R2 shape was blue, pressing on a specific R2 button earned a point. After learning the three chains, all participants received a revaluation treatment consisting of intermixed trials of R2 extinction and R6 reinforcement. Revaluation was followed by a test that consisted of intermixed R1, R3, and R5 trials.

Results: Participants successfully learned the chain task. Test results indicate lower responding on R1 (mean = 1.6 responses/s), associated with the extinguished R2, compared to R5 (mean = 2.4 responses/s), associated with the reinforced R6 (paired $t(26) = 2.46$, $p = .021$).

Conclusions: The results are consistent with rat studies suggesting that behavior chains involve learning specific associations between responses, and that R2 can function as a "goal" for R1. This research has potential to address difficulties in the experimental study of habits and goal-directed actions with humans, and provide a more complete understanding of the associative basis of addicted behavior.

LOW CLINICAL INSIGHT IS ASSOCIATED WITH LESS CRAVING

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Abstract Detail: Human
Drug Category: Other, substance use disorders or behavioral addictions
Topic: Mechanisms of Action
Abstract Category: Original Research

Aim: To examine the link between level of clinical insight and craving reported in past 30 days among subjects seeking treatment for substance use disorders or behavioral addictions. Based on clinical insight theories, subjects with low clinical insight could have difficulties to identify or estimate symptoms of addiction such as craving.

Methods: Participants from a French addiction outpatient clinic were screened for DSM-5 use disorder criteria and assessed with the Addiction Severity Index (ASI). Low and good clinical insights were defined by congruence between use disorder severity (number of DSM-5 use disorder criteria) and need for addiction care (ASI-DAQ24, how much patients wanted care for each reported addiction). Frequency (0-30 days) and intensity (0-10 points) of craving in the past 30 days were reported on numeric scale. Multiple regression analyses of craving frequency and intensity by insight were adjusted on age, sex, study level, addiction type and severity, psychiatric comorbidities.

Results: 650 subjects were included after informed consent. In comparison to good clinical insight (n=500), low clinical insight (n=150) was associated to less craving frequency and intensity (maximum and average) (coefficients = -3,19; -0,85; -1,14 respectively; p<0,0001 for all associations).

Conclusions: Future studies should clarify the influence of clinical insight on the link between craving and relapse, and control for memory performance, as low insight has been associated to episodic memory dysfunctions.

PRECLINICAL ABUSE LIABILITY ASSESSMENT OF SEP-363856, A COMPOUND WITH A NON-D2 RECEPTOR MECHANISM OF ACTION

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Abstract Detail: Animal Study
Drug Category: Other, novel mechanism of action
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: SEP-363856 is a novel psychotropic agent with a unique, non-D2, non-5-HT2A mechanism of action (MOA) which has shown broad efficacy across multiple animal models relating to aspects of schizophrenia. The molecular targets responsible for the antipsychotic efficacy of SEP-363856 are not fully elucidated but include agonism of TAAR1 and 5-HT1A receptors. Based on its unique MOA and profile in animal models, SEP-363856 represents a promising candidate for the treatment of schizophrenia and potentially other neuropsychiatric disorders. Given the central nervous system activity and novel MOA of this new chemical entity and in line with health authority guidance, a series of preclinical studies were undertaken with SEP-363856 to evaluate its potential abuse liability.

Methods: A series of abuse-related animal behavioral studies (self-administration and drug discrimination) were conducted in male and female rats to evaluate whether SEP-363856 produces behavioral changes suggestive of human abuse potential. In addition, studies were undertaken to probe the potential for SEP-363856 to block reinstatement of cocaine-seeking behavior in male rats.

Results: SEP-363856 was not self-administered by rats trained to self-administer amphetamine, cocaine, or heroin. Over a behaviorally-active dose range, the subjective qualities of SEP-363856 were distinct from those produced by amphetamine in a drug discrimination procedure. SEP-363856, and buspirone, a non-scheduled anxiolytic with 5-HT1A agonism, partially generalized to the interoceptive cue elicited by 3, 4-methylenedioxymethamphetamine. SEP-363856 demonstrated a trend to reduce reinstatement responding produced by cocaine prime and dose-dependently reduced cue-reinstated responding (p=0.0276 at 10 mg/kg).

Conclusions: Based on the established predictive validity of the self-administration and drug discrimination behavioral paradigms in rats, these results suggest that SEP-363856 is not likely to pose a risk for abuse in humans. Further, the results of reinstatement studies suggest potential therapeutic utility of SEP-363856 in the treatment of substance use disorders which warrants further investigation given the purported role of TAAR1 in addiction.

HOW MUCH DOES CRAVING CONTRIBUTE TO USE AMONG SUBSTANCE USERS NOT ATTEMPTING TO ABSTAIN? ECOLOGICAL MOMENTARY ASSESSMENT STUDY AMONG SUBSTANCES USERS IN HARM REDUCTION PROGRAMS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Examine the prospective link between, craving and substance use among substance users recruited in harm reduction programs, an environment that is substance-use-friendly.
Methods: Subjects with sedatives or stimulants use disorder were included from a French harm reduction program. Ecological Momentary Assessment was used during a 2-week period. Participants were questioned four times per day on craving intensity, substance use. Hierarchical Linear and nonlinear Modeling was used to test the prospective link between craving and substance use.
Results: Nineteen subjects were included. Craving was strongly associated with concurrent ($t=3.993$, $p<0.001$), and subsequent substance use ($t=2.332$, $p=0.032$). Substance use was a strong predictor of craving intensity at the next assessment ($t=4.386$, $p<0.001$).
Conclusions: Results show for the first time, among active substances users not attempting to abstain, that increase of craving intensity predicts increase in probability of main problematic substance use. In addition, our results highlight a bidirectional association between craving and substance use. Our findings underscore the extent to which craving contributes to addiction chronicity even in the context of active substance use.

EVIDENCE FOR A ROLE OF NOCICEPTIN/ORPHANIN FQ IN MODULATING BINGE-FEEDING BEHAVIOR VIA THE HEDONIC ENERGY BALANCE CIRCUITRY

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Abstract Detail: Animal Study
Drug Category: Opiates/Opioids
Topic: Mechanisms of Action
Abstract Category: Original Research
Aim: We tested the hypothesis that nociceptin/orphanin FQ (N/OFQ), via NOP receptor signaling, will inhibit VTA A10 dopamine neuronal excitability to influence hedonic consumption of palatable food.

Methods: Electrophysiologic recordings were performed in coronal mesencephalic slices prepared from male and ovariectomized female Prepronociceptin (PNOC)-cre (n=36) and TH-cre (n=57) animals to determine if exogenously administered N/OFQ, and endogenously stimulated N/OFQ release could directly inhibit A10 dopamine neurons via activation of G protein-gated K+ channels. Wildtype counterparts were utilized for in vivo binge-feeding behavioral experiments where animals were exposed to a high-fat-diet (HFD) for one hour each day for five days, and monitored for energy intake.

Results: Limited intermittent access to HFD (one hour per day from 16:00–17:00) causes a rapid, dramatic escalation in consumption, such that otherwise chow-fed males end up eating over 25% of their daily intake during that one-hour exposure, whereas chow-fed, hypoestrogenic ovariectomized (OVX) females and obese males continuously exposed to HFD for five weeks before initiating the binge-feeding paradigm surpass 40% (one-way ANOVA/LSD: F=57.12, p < 0.001, n=8). N/OFQ administered directly into the VTA suppresses this binge-like escalation in chow-fed OVX females, whereas in males this N/OFQ-induced reduction occurs only in those previously exposed long-term to HFD (one-way ANOVA/LSD: F=6.32, p < 0.001, n=4-8). The hedonic energy balance circuitry is engaged during binge eating, as photostimulation of VTA N/OFQ neurons produces a slow inhibitory postsynaptic current in neighboring VTA neurons receiving input from N/OFQ fibers, an effect mirrored by bath applied N/OFQ in A10 dopamine neurons. Both endogenous release and exogenous administration also produce a hyperpolarization and decrease in firing.

Conclusions: Collectively, these findings provide key support for the idea that N/OFQ regulates energy homeostasis though its actions within the hedonic energy balance circuity. This regulation is sexually differentiated, and further intensified under conditions of diet-induced obesity/insulin resistance.

SLEEP AND HYPERAROUSAL: INABILITY TO DISCONTINUE CHRONIC HYPNOTIC USE

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Abstract Detail: Human
Drug Category: Sedative-Hypnotics
Topic: Behavior
Abstract Category: Original Research

Aim: Inability to discontinue chronic hypnotic use by people with insomnia remains a clinical concern. Sleep and hyperarousal were examined in an on-going "blinded" clinical trial in which people with insomnia are instructed to discontinue their study medication after 6 months of nightly use.

Methods: DSM-V diagnosed people with insomnia (n=31, 26 females), aged 23-61 yrs, with a polysomnographic sleep efficiency (SE) of <85% on a 8-hr polysomnogram, no other sleep disorders, unstable medical or psychiatric diseases or drug dependency have completed the clinical trial. Participants were randomized to zolpidem XR (12.5 mg), eszopiclone (3 mg) or placebo nightly for 6 months (blinded groups A: n=11, B: n=9, C: n=11). After 6 months, over a 2-week choice period, they were given the instruction to discontinue their nightly hypnotic use with an opportunity, if necessary, to self-administer either 1, 2, or 3 capsules of their assigned medication (zolpidem XR 6.25 mg as capsule 1, 6.25 mg as capsule 2, placebo as capsule 3; eszopiclone 2 mg, 1 mg, and placebo as capsules 1, 2 and 3 respectively; or 3 placebos.

Results: Fifteen subjects stopped taking study medication when told to discontinue. The other 16 subjects who took study medication (users) had longer MSLT (a measure of hyperarousal) sleep latency (16.2 vs 8.3 min) than non-users (p<.001) at baseline. At baseline users and non-users had similarly disturbed nocturnal sleep: SE 73.4 vs 73.9 %, with sleep latencies of 54 vs 40 min and wake time after sleep onset of 90 vs 104 min.

Conclusions: Hyperarousal, defined by MSLT and high diurnal urinary cortisol levels, has been found in some people with insomnia. High MSLTs were previously associated with dose escalation in a chronic zolpidem use study. These emerging data would suggest high MSLT may also be predictive of difficulty discontinuing hypnotic use.

DELAYED PUNISHMENT DISCOUNTING DIFFERS BETWEEN SEXES AND IS MEDIATED BY ORBITOFRONTAL CORTEX

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Abstract Detail: Animal Study
Drug Category: Other, Substance Use Vulnerability
Topic: Behavior
Abstract Category: Original Research

Aim: Individuals with substance use disorders often seek out drug rewards despite financial, physical, and social consequences. One rationale for this maladaptive decision-making is that consequences of substance use are often delayed, resulting in undervaluation of their negative motivational value. To model this reduced sensitivity to consequences during reward seeking, we developed the Delayed Punishment Decision-making Task (DPDT).

Methods: During the Delayed Punishment Decision-making Task, 10 male and 10 female Long Evans rats chose between a small, immediate reward or a large, immediate reward succeeded by a foot shock that occurred systematically later in time. Pharmacological inactivation of orbitofrontal cortex (OFC) was achieved by micro-infusing GABA agonists baclofen and muscimol counterbalanced with saline and intermittent baseline days. Stable decision-making was tested using a repeated measures day X block ANOVA. Sex differences were assessed using a sex X block mixed ANOVA. Paired sample t-tests were used to compare means of the two OFC inactivation and two saline micro-infusion days.

Results: We observed that rats were more likely to select the punished reward when the associated shock was delayed, indicating that rats discount the negative value of delayed punishment (p < .001). Male rats discounted delayed consequences more than females (p = .049), and female estrous cycle was not associated with decision-making (p = .172). Finally, we found that pharmacological inactivation of orbitofrontal cortex (OFC) reduced choice of large rewards associated with delayed punishment similarly in both males and females as delay increased (p = .016), suggesting OFC as a potential locus for the discounting of delayed consequences.

Conclusions: Further exploration of the neural regions involved with delayed punishment discounting will contribute to the understanding of this behavioral phenotype and future treatments involved with substance use disorder.

Criminal Justice

"IF SOMETHING WORKS, WHY MAKE [TREATMENT] HARDER": THE NEGLECTED PERSPECTIVE OF RANDOMIZATION AND CLINICAL EQUIPOISE IN A SAMPLE OF JUVENILE JUSTICE-INVOLVED FAMILIES

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Other
Abstract Category: Original Research

Aim: Treatment researchers have begun to question clinical equipoise as a core ethical principle in the design of randomized trials involving behavioral treatments. The main argument is that potential participants can evaluate the goals of behavioral treatments and make a personal judgment as to which one will work best for them. This argument raises a novel ethical question: Is it ethical for one to be randomized to an intervention arm when they believe the other intervention is best for them? This ethical question may be particularly relevant for participants enrolling in treatment research when they are mandated to treatment and expected to achieve measurable change. The purpose of this study was to examine ethically relevant attitudes of justice-involved youth mandated to substance use treatment and their legal guardians to a hypothetical randomized controlled trial.

Methods: Five adolescents (60% male; Mage = 16.4; SD = 0.9) and 6 guardians (Mage = 41.9; SD = 10.6) were individually presented with a hypothetical randomized controlled trial and interviewed about the risks and benefits of the randomization procedure. Interviews were recorded, transcribed verbatim, and coded line-by-line without the use of specialist software.

Results: Data were analyzed using a constant comparative method. Preliminary themes included benefits and risks of the treatment, therapeutic misestimation, violations of clinical equipoise, and random assignment as an unjust procedure.

Conclusions: Preliminary results from this study, which is ongoing, suggest that among youth mandated to drug treatment, individuals responsible for providing consent may be vulnerable for overestimation of experimental treatment benefits and beliefs that one condition is inferior to the other. Results also suggest specific types of treatment conditions may be related to more negative emotions as potential risk for study participation. By June, the sample size for this study is expected to be 24 (12 youth; 12 caregivers).

SUBSTANCE ABUSE TREATMENT SERVICES UTILIZATION AND EXPENDITURES AMONG DRUG COURT PROBATIONERS IN THE NEW ENGLAND REGION, 2015-2018

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)

Topic: Treatment

Abstract Category: Original Research

Aim: Drug court probationers may access a comprehensive spectrum of prevention, treatment, and recovery services through licensed providers. We sought to answer how the relative cost of substance abuse treatment services provided to probationers in drug courts compared to probationers in traditional courts. Court probationers were not assigned at random, therefore we used propensity score matching to address baseline non-equivalence and compared service utilization and expenditures among traditional probationers to a matched sample of probationers in drug courts. We hypothesized that drug courts would expend more on substance abuse treatment services.

Methods: De-identified study demographics and clinical data were collected from a combination of probation and court records. Substance abuse treatment services utilization and payments data were derived from an administrative claims dataset. Using a quasi-experimental study design, 271 traditional court probationers were matched to 271 drug court probationers enrolled in their respective courts during the period August 1, 2015 through February 28, 2018 with a follow-up period ending August 30, 2018.

Results: A significantly greater proportion of probationers in drug courts (72.3%) used this substance abuse treatment service payer program than their traditional court counterparts (31.4%). Among those who received services, the average expenditure in drug courts was $12,511 compared to $4,920 in traditional courts. Probationers in drug courts were enrolled in the substance abuse program longer than traditional court probationers (259 and 138 days respectively) and drug court probationers used a significantly greater amount of long-term residential services.

Conclusions: Drug courts provided substance abuse treatment services to a greater proportion of probationers, however, these probationers were also at higher risk of recidivism and more likely to have opiate addiction. Differences in utilization of services and amounts paid to providers resulted in a significant difference in the average expenditures per probationer driven by utilization of long-term residential services by the drug court probationers.

"WE HAVE THE BIGGEST CHANCE TO EITHER DESTROY OR SAVE SOMEONE'S LIFE:" A QUALITATIVE STUDY WITH SHERIFFS REGARDING JAIL-BASED HEALTHCARE

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Abstract Detail: Human

Drug Category: Opiates/Opioids

Topic: Substance Use Disorder

Abstract Category: Original Research

Aim: Incarcerated individuals in the U.S. have increased prevalence of chronic medical conditions, including HIV. Jail healthcare contracts vary widely in meeting individuals' needs. It is imperative to understand sheriffs' considerations of incarcerated individuals' healthcare needs as they are uniquely positioned to assist in navigating contracts.

Methods: At the June 2019 National Sheriffs' Association national conference, we conducted 3 interviews and 5 focus groups (totaling 19 people) with sheriffs from 18 jails across all 6 defined US regions. Questions examined sheriffs' attitudes and experiences regarding healthcare in correctional settings and in the transition from jail. We explored the feasibility

and acceptability of potential tablet-based interventions and peer navigation addressing substance use disorders (SUD), HIV, mental health, and other medical conditions for both women and men. We utilized consensual qualitative research analysis with an interdisciplinary team.

Results: Jail sizes ranged from 25 to 1400 beds and had 10-20% women. Sheriffs of smaller jails generally had fewer healthcare resources and were less open to MAT for SUD, HIV prevention, and staff training for new programs. Attitudes towards MAT varied for Naloxone, injected Naltrexone, Buprenorphine, and Methadone, ranging from strong support to concern that it facilitated drug use in and outside of jail. A few jails already were using all forms of MAT and tablet-based learning. While there was a desire among all sheriffs to improve healthcare, many described inadequate resources, HIV testing as optional and underemphasized, and were generally not aware of HIV pre-exposure prophylaxis. Most were open to new collaborative interventions, but cost was a primary concern.

Conclusions: Sheriffs described inadequate healthcare and discharge planning services, impacted by funding, understaffing, inadequately trained staff, or hesitancy to offer MAT. However, they expressed interest in implementing a collaborative, peer navigation program. Our findings support the need for further quantitative examination engaging a broader sheriff sample.

"I RAISED MYSELF-I DIDN'T HAVE TO GO TO SCHOOL IF I DIDN'T WANT TO:" FEMALE OPIOID COURT PARTICIPANTS SHARE NARRATIVES REGARDING A LIFETIME OF INTERACTIONS WITH SILOED MEDICAL, LEGAL AND SOCIAL SERVICE SYSTEMS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: A gap in the literature exists regarding women with opioid use disorder (OUD) and how to create, test and implement gender-specific interventions. Nationally, efforts exist to reduce the criminalization of OUD-related crimes, including Opioid Courts.

Methods: We explored the intersection of this gap by assessing 31 female participants' experiences in the first known Opioid Court. An interdisciplinary team conducted this qualitative interview study to inform next steps for cross-sector integrated approaches to address opioid-dependent justice-involved women's needs. Using a Consensual Qualitative Research approach, we analyzed the transcriptions creating an iterative codebook. We explored participants' cross-sector involvement: interactions with the legal, child protective, medical, and substance use disorder treatment systems.

Results: Data reveal the complexity of participants' involvement with organizations given the duality of their roles. Participants presented as lifetime victims (i.e. abused or neglected children in the CPS system, gender-based violence victims) and simultaneously as perpetrators (i.e. neglect while using drugs, committing an OUD related crime). Conversely, participants

noted the importance of personal relationships to foster personal growth and change, such as a presiding judge, in recovery, who related to participants' lived experiences.

Conclusions: The systems designed to "help" participants as children become part of a structure participants have difficulty trusting due to lifetimes of systematic failures to prevent or address their abuse and neglect. The opioid crisis cannot be solved by one sector in isolation, nor without a deep understanding of women's early and ongoing trauma. We conclude with asking the futility of using punitive systems for adults after the harm has been done to them. Rather, we suggest when medical, legal, and social systems encounter adults with OUD, early intervention may be more fruitful. Such interventions could tend also to opioid users' children and multigenerational caretaking extended family.

THEORETICAL CONSIDERATIONS FOR MECHANISMS OF RECOVERY FOR JUSTICE-INVOLVED WOMEN

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Theoretical/Commentary
Aim: Theoretical perspectives on women with substance use disorders (SUDs) involved with the criminal justice system are often siloed in the context of a certain field (ie, addiction, gender, criminal behavior). Moreover, theory within the addiction literature is often implied rather than explicitly stated. This presentation will review theories that explain how individuals orient to and become involved with SUDs and criminal behavior and will then focus on theories of addiction recovery that illustrate how women leaving prison may recover from substance use disorders. This is important as women are the fastest growing justice involved population, and are also more likely to have a SUDs, compared to their male peers.
Methods: The author reviewed theoretical perspectives across the fields of addiction, gender, and criminal justice. During this review, three groups of theoretical perspectives were noted: addiction etiology, SUDs recovery, and recovery of women. Differences and applications of gender are noted throughout.
Results: Theories within each of the three theoretical perspective groupings will be reviewed. Additionally, limitations found during the review of theoretical perspectives will be discussed, specifically the need to apply an intersectional lens that will honor the impact of race/ethnicity and exposure to drug and alcohol at early ages, particularly for women of color. Moreover, the limitations acknowledge the historical and cultural traumas experienced by non-White populations, especially as it relates to SUDs.
Conclusions: Relationships and connection were prominent themes found during the theoretical review. These themes speak to how essential positive social support is and highlights the impact of disconnection can happen at a personal and societal level. Relationships, connection, and disconnection are integral in women's recovery and their reintegration into society and represent the importance of gender specific perspectives in treatment and programming. Existing programs founded from historically male models of treatment can be harmful to women. The importance of focusing on the relational context in this review is critical to not only women's development and recovery, but arguably to all human development.

IMPLEMENTATION FACTORS IN EXPANDING MEDICATIONS FOR OPIOID USE DISORDER IN THE CRIMINAL JUSTICE SYSTEM: A SYSTEMATIC REVIEW

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Literature Review
Aim: Background: Incarcerated individuals with opioid use disorder (OUD) have high post-release mortality driven by opioid relapse. A key evidence-based intervention for this priority population is medication for opioid use disorder (MOUD); however, less is known about determinants of successful corrections-based MOUD implementation, which can guide public health strategy.
Aim: Identify factors impacting successful corrections-based implementation of MOUD.

Methods: Methods: We conducted a systematic literature review and registered our protocol with the International Prospective Register of Systematic Reviews (PROSPERO, CRD42019123740). We searched peer-reviewed journals from 2013-2019 for studies that were: (1) randomized control, pilot, cohort, or cross-sectional; (2) about evidence-based OUD pharmacotherapy; (3) set in corrections (pre/post-trial, community supervision) and (4) in English. We summarized the final results with narrative synthesis using the Promoting Action in Research in Health Services (PARiHS) implementation science framework.
Results: Results: From 4769 results, 42 studies met inclusion criteria. Key implementation strategies or contextual factors in corrections-based MOUD included: (1) providing MOUD during incarceration, rather than referral after release; (2) active facilitation of linkage to care after release ("warm" hand-offs, detailed discharge planning, bridging prescriptions until community linkage, peer navigators); (3) active facilitation of (corrections, medical) staff knowledge and attitudes; (4) integrated institutions, such as centralized corrections organization or robust partnerships between justice and health organizations; and (5) patient perceptions, attitudes and knowledge towards OUD and treatment.
Conclusions: Conclusion: Expansion of MOUD for corrections-based populations is a central intervention for addressing the opioid crisis. Several implementation strategies and contextual factors are identified that can impede or facilitate intervention success, but their impact is not well quantified. There is increasing efficacy data for corrections-based MOUD for improving outcomes but further study of implementation factors is critical to guide dissemination and public health strategies in this key population.

CHALLENGES, FACILITATORS, AND BENEFITS OF DELIVERING MEDICATIONS TO TREAT OPIOID USE DISORDER IN RURAL JAIL SETTINGS

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Abstract Detail: Human
Drug Category: Opiates/Opioids

Topic: Policy
Abstract Category: Original Research
Aim: Background: People with opioid use disorder (OUD) who are released from jail face increased overdose risks. Nationwide efforts seek to improve access in justice settings to all three FDA-approved medications to treat OUD (MOUD).
Objectives: We aimed to detail the first year of implementation of a program by two jails in Western Massachusetts to increase MOUD access during incarceration and post-release.

Methods: Methods: We conducted 30 semi-structured qualitative interviews and focus groups in 2019 with program implementers (i.e., administration, medical and behavioral healthcare, corrections, community re-entry casework). We analyzed data in Atlas.ti 8 using an inductive approach.

Results: Results: A key implementation challenge is concerns regarding MOUD diversion and other potential safety risks. Other challenges include limited physical space in jail; stigma, short stays, and other reasons why prospective participants refuse or are unable to receive MOUD; steep, swift, and burdensome learning curves regarding MOUD types and protocols; bureaucratic hurdles specific to in-jail delivery of methadone; and limited MOUD capacity in the community. Implementation facilitators include program buy-in and co-creation from leadership to line staff; established protocols to screen, assess, and treat individuals based on needs and criminal justice disposition; education and training that is multi-modal, continuous, and features knowledgeable trusted staff; communications infrastructure that enables collaborative decision-making; and robust re-entry programming. Perceived program benefits include reduced opioid withdrawal symptoms, greater cooperation among participants and reduced disciplinary actions, greater intentions to continue MOUD post-release, improved organizational capacity for healthcare delivery, and increased opportunities for staff to develop new competencies while helping to reduce recidivism and save lives.

Conclusions: Conclusions: Findings suggest that MOUD-in-jail programs can be implemented and sustained and are a feasible intervention that can be adopted by other criminal justice settings.

TREATMENT NEEDS AND GENDER DIFFERENCES AMONG CLIENTS ENTERING A RURAL DRUG TREATMENT COURT WITH A CO-OCCURRING DISORDER

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Sex Differences
Abstract Category: Original Research
Aim: Although drug treatment courts (DTCs) have been well established, research focused on the needs of DTC clients in rural communities is nascent. This pilot study fills this gap by reporting on treatment needs and gender differences among a rural Massachusetts DTC. Despite the distinct research on rural Co-occurring Disorder (COD) treatment needs and DTCs, there is a dearth of research examining the COD treatment needs of rural drug court participants by gender differences. This lack of information on treatment needs among rural DTC participants with a COD and by gender is unfortunate given that many are in Mental Health Professional Shortage Areas (MHPSAs).

Methods: DTC intake data was analyzed for 73 participants (57.5% males, 42.7% females). To determine gender comparisons, we computed independent sample T-Tests/Mann Whitney-U for continuous variables, and chi-square tests for categorical variables.

Results: Females disproportionately experienced more lifetime trauma (77.4% vs. 47.6%, p<.014), sexual abuse (48.4% vs. 16.7%, p<.005), interpersonal violence 77.4% vs. 33.3%, p<.0002), chronic and recent medical conditions (38.7% vs.16.7%, p<0.034), lower employment (22.6% vs. 47.6%, p<0.028), and unstable housing (77.9% vs. 33.3%, p<.001). Males had more CJ involvement (age of first arrest (15.5 vs. 19.8, p<.003), average number of arrests (7.95 vs. 4.54, p<.025), average number of months incarcerated (32.9 vs. 10.58, p<.001), and more violations of probation/parole 88.1% vs. 65.5%, p<.009)), lifetime alcohol use (9.86 vs. 5.55, p<.008), lack of dental care (23.8%, 51.6%, p<.014), and more needle sharing compared to females (50% vs 6.7%, p< .05).

Conclusions: These findings have implications for specialty court management, treatment planning, and for integrating treatment alongside DTCs to address participant treatment needs.

CORRELATES OF RELAPSE AMONG RURAL WOMEN AT COMMUNITY RE-ENTRY FROM JAIL

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Behavior
Abstract Category: Original Research

Aim: Aim: Community re-entry from jail has been identified as a high-risk time for individuals, often characterized by relapse and overdose. A limited body of research has examined correlates of relapse among high-risk women who use drugs, but most of this research has been focused on urban areas. This study examines internal and external factors associated with relapse among rural women with a history of drug use 12-months following release from jail.

Methods: Methods: This study includes 400 women who were randomly selected, screened, and consented from three rural jails in Appalachia. Of these, 340 (85%) completed follow-up interviews 12 months post-release from jail. Bivariate analyses compared women reporting relapse to any drug during re-entry to those who did not relapse, focusing on demographics (employment and education), self-efficacy (self-reported re-entry strengths), self-reported readiness to abstain from drug use, and desire for help. A logistic regression model examined factors associated with relapse at 12-month follow-up.

Results: Results: About two-thirds (62.5%) of women reported relapse to any drug during the 12 months post-release from jail. Women who relapsed were significantly less likely to be employed (21% vs. 47%) and more likely to report financial problems (86% vs. 68%). The logistic regression model indicated that readiness to abstain (AOR=0.90) and desire for help (AOR=0.82) significantly decreased likelihood of relapsing, even when challenges like housing and peer socialization were considered.

Conclusions: Conclusion: Findings from these analyses suggest that readiness to change and desire for help may be important predictors of sustaining recovery for high-risk rural women with substance use disorders. These factors may be even more protective for relapse risk than external factors such as stable, recovery-supportive housing and peers. Future research should

examine interventions targeted to an individual's recovery self-efficacy to enhance and support treatment success.

IMPACT OF FIDELITY OF IMPLEMENTATION ON ORGANIZATIONAL OUTCOMES IN CORRECTIONAL TREATMENT SETTINGS

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Abstract Detail: Human
Drug Category: Other, Alcohol and other drug use
Topic: Other
Abstract Category: Original Research
Aim: To examine implementation fidelity to an organizational process improvement intervention (OPII) designed to improve evidence-based assessment and community re-entry for drug-involved offenders.
Hypothesis: Organizational Leadership moderates relations between fidelity and outcome.
Methods: A cluster randomized design was used to randomize 21 sites to either an early- or delayed-start intervention within 9 research centers. Implementation fidelity included Responsiveness (program engaged staff), Dose (amount of program delivered to staff), Quality (program delivered clearly) and Adherence (program components delivered as originally designed). Organizational outcomes were site-level success in achieving Goals/Objectives set during OPII program.
Results: Leadership by Responsiveness interaction was significant for Goals (B=.15, p=.045) and Objectives (B=15, p=.03) achieved. At low levels of Leadership, increased staff Responsiveness to OPII related to poorer outcome (Goals, B=.19, p=.03; Objectives, B=.20, p=.01).
Conclusions: It may be that relatively poor leadership in combination with responsive staff created (or was symptomatic of) conflict which led to relatively fewer goals and objectives being achieved. Alternatively, it may be that under poorer leadership, easier goals and objectives were wisely chosen, requiring less responsiveness to accomplish. This study indicates it is important to consider contextual factors, such as leadership, that may influence fidelity when implementing evidence-based practices.

UNDERSTANDING THE USE OF DIVERTED BUPRENORPHINE DURING INCARCERATION IN MARYLAND

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: To explore how and why individuals with opioid use disorder use diverted buprenorphine during incarceration Maryland, where buprenorphine treatment is not yet available in jails or prisons.

Methods: Adults recently released from jail or prison (n= 26) completed semi-structured qualitative interviews as part of a study focused on buprenorphine diversion in the criminal justice system. Qualitative interviews explored participants' incarceration experiences and opioid use background, knowledge of buprenorphine and other substance use in jails/prisons, personal use of buprenorphine while incarcerated, reasons for using buprenorphine while incarcerated, knowledge of how buprenorphine is brought into and acquired in jails/prisons, desire for treatment and treatment availability in jails/prisons, and reflections on how making buprenorphine treatment available in jails/prisons would impact use of diverted buprenorphine while incarcerated. Participants in the qualitative sub-sample ranged in age from 23-68 (mean= 38.3 years). The gender distribution was 15 male, 10 female, and 1 trans-female identified individual, and the sample self-identified as African American (58%) and White (42%).

Results: Several key themes emerged from the qualitative interviews surrounding buprenorphine diversion during incarceration, including: 1) the perceived high prevalence of diverted buprenorphine in jail/prison settings, 2) how the perception of prevalence is related to buprenorphine film formulation, 3) adaptive routes of administration due to the high cost of diverted buprenorphine, and 4) reasons individuals who are incarcerated use diverted buprenorphine (to self-treat opioid use disorder or withdrawal, vs. to achieve euphoric effects).

Conclusions: Participants reported widespread availability of diverted film formulation buprenorphine in the criminal justice system, and characterized reasons for its use specific to criminal justice contexts. More research is needed to determine the impact of expanding buprenorphine treatment in jails and prisons on inmates' use of diverted buprenorphine, and future research should explore these intersections as treatment initiation opportunities.

Harm Reduction

RISK MINIMIZATION ACTIVITIES FOR PRESCRIPTION PAIN MEDICATION IN THE UK: MONITORING EFFECTIVENESS WITH A WEB BASED SURVEY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Prevention
Abstract Category: Program Descriptions

Aim: In the UK, the risks associated with specific prescription medications are identified at the time of licensing and outlined in a Risk Management Plan (RMP) for the product. This plan contains activities which are designed to minimize the risks of medications in the general population. The regulatory authority decides whether these activities can be routine (passive) only or whether additional (active) activities are required. For the specific example of Fentanyl products, additional risk minimization activities include the provision of patient guides, which are designed to be given to a patient at the time of prescribing by their Healthcare Professional (HCP). These types of educational activities are often included in the RMP, but evidence is needed to determine if they are effective for minimizing risks to patients. Studies that only collect data from HCPs are limited with regards to effectiveness of patient guides, though this

is a common study design for monitoring effectiveness of risk minimization. To address this evidence gap, a web based survey (app) has been designed to collect information directly from patients prescribed pain medications (including Fentanyl and other opioids), to determine if: 1. patients are given the guide by the prescribing HCP, 2. patients read the guide, 3. patients understand the guide and 4. guides reduce outcomes such as medication errors, non-medical use and misuse. Distribution of the web survey will be through patient groups initially, with the potential to expand to advertisement in the general population through social media and other web platforms.

Conclusions: This research program will inform on whether current risk minimization activities for prescription pain medications undertaken in the UK are sufficient. The scope of this web-based survey also extends beyond prescription pain medications, as it can be adapted to monitor the effectiveness of risk minimization activities for other medications in the future.

ASSOCIATION BETWEEN PRESCRIPTION OPIOID SUPPLY AND FATAL DRUG POISONINGS IN THE UNITED STATES

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: Greater area-level prescription opioid supply is associated with more fatal drug poisonings in many, but not all studies. Heterogeneity across studies may arise from methodological variation in modeling this association. This analysis aimed to investigate three potential sources of this heterogeneity: geographic unit used to aggregate data, measures of prescription opioid supply and type of fatal drug poisoning, holding constant two common sources of bias, inadequate adjustment for potential confounders variables and spatial autocorrelation of nearby counties.

Methods: We measured associations between county-level prescription opioid supply and fatal drug poisonings in 2006-2016 across 3,109 U.S. counties. Comparisons were made across geographic aggregation, type of fatal drug poisonings, and measure of prescription opioid supply. We used Bayesian Poisson conditional autoregressive models, adjusting for compositional and contextual differences across counties.

Results: County-level analyses showed that in descending order, prescription opioid supply was most associated with deaths due to opioids only, prescription opioids only, any drug, and heroin. Regarding geographic aggregation, county-level analyses produced estimates smaller in magnitude than state-level estimates. All results were robust to the two different measures of prescription opioid supply.

Conclusions: We found a positive association between prescription opioid supply and fatal drug poisonings robust to type of drug poisoning, level of aggregation, and measure of prescription opioid supply. Given consistent results across the methodological sources of variation, previous heterogeneity of effect estimates may arise from inadequate adjustment for potential confounding and/or spatial autocorrelation, two sources of bias we held constant throughout.

RELATIONSHIP OF BENZODIAZEPINE AND OPIOID CO-USE TO ALL-CAUSE MORTALITY: AN NHANES AND NATIONAL DEATH INDEX ANALYSIS (1999-2014)

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research
Aim: While overall opioid use has been plateauing, benzodiazepine (BZD) and opioid co-prescriptions have increased significantly in recent years. It is unknown whether this combination is an independent risk factor for increased all-cause mortality as opposed to being more frequently used in patients with baseline elevated risk of death.
Methods: We used eight cycles of data, spanning over 15 years of follow-up time, from a large, nationally representative dataset (National Health and Nutrition Examination Surveys; NHANES). Mortality data was obtained via linkage of NHANES to the National Death Index (NDI). Propensity scores were calculated from covariates related to sociodemographics, health care utilization, comorbidities, and medication use for >1,000 prescriptions matched to Lexicon Plus® by Cerner Multum Inc., which classified medications by therapeutic drug categories. Propensity score-weighted mortality hazards were calculated from Cox proportional hazards models.
Results: Out of 5,212 participants ages 18 and older followed for a mean of 13.57 years, 101 deaths occurred out of 468 receiving both BZDs and opioids, 236/1,256 receiving BZDs only, 328/1,955 receiving opioids only, and 227/1,533 in an active comparator group of selective serotonin reuptake inhibitor (SSRI) recipients prescribed neither BZDs nor opioids. In unadjusted analyses, patients receiving co-treatment had a significantly elevated hazard of death compared to those on only BZDs (HR 1.30, 95% Confidence Interval [1.02-1.66]), opioids (HR 1.46 [1.16-1.84]), and neither (HR 1.68 [1.31-2.14]). After propensity-score weighting, hazards of death became more comparable between the co-treatment group and peers receiving only BZDs (HR 1.07 [0.78-1.47]), only opioids (HR 1.33 [1.01-1.76]), and neither BZDs nor opioids (HR 1.53 [0.97-2.43]), with similar results in age-stratified analyses.
Conclusions: Our study suggests that prescription BZD and opioid co-use is more likely to serve as a marker for unmeasured underlying conditions resulting in death as opposed to contribute directly to increased mortality. However, modest causal effects cannot be ruled out.

MEDICALLY TREATED OPIOID OVERDOSES IN NJ MEDICAID BENEFICIARIES 2014-2017: RAPID GROWTH WITH COMPLEX COMORBIDITY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: While public and research attention to opioid overdoses has focused predominantly on overdose fatalities, these events represent the tip of a larger iceberg of opioid-related harms. Analysis of medically treated opioid overdoses provides complementary insights into trends in the epidemic and the multiple needs of individuals experiencing these events, who are at high risk of subsequent fatal overdose.

Methods: NJ Medicaid data from 2014-2017 (ages 12-64) were used to examine rates and characteristics of medically treated overdoses (healthcare encounters with diagnostic codes for opioid poisoning), and co-occurring conditions, during the calendar year.

Results: The number of individuals treated for opioid overdose increased more than threefold from 1993 in 2014 (.20% of beneficiaries) to 6578 in 2017 (.49% of beneficiaries), exceeding the state's 114% increase in all overdose deaths, while opioid prescribing declined. The rate was higher among white (.80%) than among black (.48%) beneficiaries but increased fastest among black and male beneficiaries. In 2014, 57.2% of people with an overdose had a heroin overdose, increasing to 74.9% in 2017. Opioid overdose in 2017 was highly comorbid with diagnosed alcohol disorders (58.7%), major depression (44.6%), hepatitis C (26.1%), diabetes (22.5%), pain diagnoses (58.3%), bipolar disorder (25.4%), and other mental health, substance use and chronic medical conditions. Comorbidity with major depression, alcohol disorders, benzodiazepine disorders, hepatitis C, and diabetes increased over the period.

Conclusions: Changing patterns of medically treated opioid overdoses provide important insights into the evolving epidemic. The increasing number of beneficiaries medically treated for opioid overdoses represent a clinically complex population with multiple mental health, substance abuse and medical comorbidities. To reduce fatal overdoses and other adverse outcomes, it is critical to engage these individuals in assertive interventions that address their multiple behavioral health, medical, and social challenges, requiring the integration of care across multiple systems.

A COMMUNITY RESPONSE TO AN OPIOID EPIDEMIC, HARRIS COUNTY, TEXAS: THE EVALUATION PLAN

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Prevention
Abstract Category: Program Descriptions
Aim: Harris County Texas spans 1778 square miles with a land area larger than the state of Rhode Island. Approximately 2.5 million people live within Harris County's unincorporated areas and over 30 small municipalities are located in Harris County (not including the city of Houston). The county has seen a dramatic increase in opioid-related overdose deaths. This presentation describes a recently funded project to evaluate the county health department's multi-component approach to reduce opioid-related overdose deaths that includes the implementation of the comprehensive surveillance and prevention strategies. The strategies include the integration of the public health surveillance, toxicology, emergency department and EMS, law enforcement, and jail data. It also includes the evaluation of prevention strategies associated with a social marketing campaign; physician and pharmacists medication assisted

treatment (MAT) training program; and MAT jail-based initiation and maintenance program for persons exiting the local jail.

Methods: This presentation will include the evaluation plan for the process and service delivery data components of the project but also, the extensive evaluation of the jail-based MAT program. Persons exiting the local jail with a history of an opioid use disorder will be randomized to receive MAT or MAT plus a mobile recovery app to determine if the app increases MAT adherence and improves recovery outcomes.

Results: Upon completion of the study, the following results are anticipated. Due to the multi-component prevention intervention, a decrease in opioid-related overdose deaths is expected. Persons exiting the jail randomized to MAT + a mobile recovery app are expected to be more adherent to their MAT at 3 months than persons receiving MAT only.

Conclusions: Data from this study will better inform community members of the impact of the opioid epidemic in Harris County, and will inform best practices for a community-level response to the opioid epidemic.

PREVALENCE AND CHARACTERISTICS OF POST-OVERDOSE OUTREACH PROGRAMS IN MASSACHUSETTS PROVIDING ADOLESCENT AND YOUNG ADULT SPECIFIC SERVICES

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Prevention
Abstract Category: Original Research
Aim: To describe and compare characteristics of Massachusetts based post-overdose outreach programs with and without adolescent and young adult (AYA) specific services.

Methods: From August-November 2019, we conducted a cross-sectional study of Massachusetts post-overdose outreach programs. Programs completed a 73-item survey that included questions about AYA specific services offered to overdose survivors, program harm reduction philosophy, mandated treatment, and program age. We used chi-square tests to compare the characteristics of programs that report AYA specific services and those that do not.

Results: Of 157 post-overdose outreach programs identified, 133 (85%) responded to questions about AYA services. Programs reported a median of 20% of post-overdose encounters with 18-25 yos and fewer than 1% with under 18 yos. Among respondents, 41% (54/133) provided AYA specific services. Those with AYA services compared to those without were more likely to report having a harm reduction philosophy (63% v. 52%, p=.03) and to always talk to a social network contact if the overdose survivor was not present (89% v. 46%, p<0.01). Programs with AYA services were more likely to discuss court-mandated treatment as a last resort (76% v. 53%, p=.03), but less likely to involve the overdose survivor in the discussion about mandated treatment (91% v. 61%, p <0.001). Programs that have existed for at least three years were more likely to provide AYA services (65% v. 44%, p=0.02).

Conclusions: Post-overdose encounters with young adults were common. Programs providing AYA-specific services more commonly involved family and friends and a harm reduction philosophy, reflecting efforts to broaden their engagement with AYA survivors by including

social networks. Post-overdose programs should include training to engage AYA survivors and their family and friends in order to provide age-specific risk reduction and linkage to treatment.

BARRIERS AND FACILITATORS OF NALOXONE IN OHIO: INSIGHTS FOR COMMUNITY-DRIVEN OVERDOSE REDUCTION INTERVENTIONS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Ohio is in the midst of a severe opioid-related overdose epidemic. To combat the growing opioid-related deaths, Ohio has granted the expansion of the overdose reversal drug, naloxone. However, significant barriers stand in the way of widespread use. This study identified barriers for and facilitators to opioid overdose reversal, in an effort to inform community-driven interventions in south or west Columbus, Ohio, where opioid overdose fatalities are among the highest in Franklin county.
Methods: Five focus group discussions (FGD) were conducted with 31 community members and harm reduction service providers. Fifteen in-depth interviews (IDI) were conducted with law enforcement officers (n=3), pharmacists (n=2), and people who use opioids (PWUO) (n=10). Transcribed FGD and IDI were analyzed using qualitative thematic analysis.
Results: The most commonly reported barriers included stigma towards addiction and overdose as well as hesitancy to administer naloxone primarily due to fear of legal ramifications or concerns around responsibility. Community members specifically expressed hopelessness towards using naloxone when those overdosing may not "value" their life or may continue to overdose. Many participants expressed fear of interactions with law enforcement if reporting overdoses or potential legal repercussions after administering. Several PWUO perceived that someone "of authority" must be responsible for naloxone possession and use, as there were concerns of being considered a "designated driver" among peers. Facilitators included interest in being trained in naloxone administration, specifically among community members. Additionally, key stakeholders such as law enforcement, pharmacists, and service providers are sufficiently trained and knowledgeable.
Conclusions: Peer-based models that solely target PWUO for naloxone administration may face challenges for success. Community-driven approaches that target both community members and PWUO on naloxone administration, as well as legal protections and stigma reduction, will be essential in effectively reducing opioid-related overdose in Ohio and beyond.

CHARACTERISTICS OF EMERGING POST-OVERDOSE OUTREACH PROGRAMS IN MASSACHUSETTS

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Abstract Detail: Human

Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research
Aim: At a time of increased public safety involvement in overdose response, we inventoried Massachusetts post-overdose outreach programs and described key characteristics.
Methods: From March-July 2019, we sent an online 5-item screener to public safety and public health representatives in Massachusetts' 351 municipalities to identify post-overdose outreach programs. From August-November 2019, we surveyed identified programs online, by phone, or in-person using a 73-item survey that included team composition, outreach target and timing, service offerings, naloxone delivery, privacy, mandated treatment, and cross-community collaboration. We analyzed screener and survey responses using descriptive statistics.
Results: Based on screener responses from 100% (351/351) of Massachusetts municipalities, we identified post overdose outreach programs in 45% (157/351). Among municipalities with programs, 88% (138/157) completed the survey. Most (86%, 119/138) programs began in 2015 or later and participated in a multi-community program network (94%, 130/138). More than half of the programs reported a team size of two individuals (56%, 78/138). Police officers (86%, 118/138) and recovery coaches (65%, 89/138) were the most common participating professions. Initial visits lasted an average of 23 minutes (sd=12.5), occurring 2-3 days after an overdose (57%, 79/138). Addiction treatment navigation (97%, 133/137) and overdose prevention education (93%, 128/137) were the most common services provided. Two thirds (66% 90/138) of programs distributed naloxone rescue kits. Most programs had a confidentiality protocol (84%, 114/135) and facilitated court-mandated addiction treatment (81%, 112/138). Programs commonly conducted additional follow-up (86%, 119/138), primarily by phone (87%, 103/119) and in-person (65%, 77/119).
Conclusions: Post-overdose outreach is an emerging response to the overdose crisis that seeks to engage individuals in addiction treatment and overdose prevention. Further research is warranted to understand the effectiveness, benefits and risks of these programs, and establish best practice guidelines.

NATIONAL EPIDEMIOLOGICAL CHARACTERIZATION OF OPIOID OVERDOSE BY EVENT INTENTIONALITY FOR INPATIENT STAYS ACROSS THE UNITED STATES, 2013-2015

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research
Aim: Deaths from both opioid overdose and suicide are converging epidemics in the United States. This research presents an epidemiological characterization of national hospital inpatient stays for opioid overdose by event intentionality (suicide, accidental, or unknown/ambiguous) between 2013 and 2015.
Methods: Data are from the National Inpatient Sample, the largest publicly available, all-payer inpatient care database in the US (2013 to quarter three 2015; total N=20M; both sexes). Results are weighted to provide national estimates of inpatient stays. Models include negative binomial regressions for count dependent variables (returning Incidence Risk Ratios, IRR), and

multinomial logistic regressions for categorical dependent variables (returning Relative Risk Ratios, RRR), all conducted using Stata 15.

Results: Opioid overdose stays increased 15% between 2013 and 2015, driven by unknown/ambiguous (37% increase) and accidental (10% increase) cases; suicide cases decreased (2%). Compared to unknown/ambiguous, suicide cases were at reduced risk of high severity (IRR=0.847; 95%CI: 0.84-0.86; p<0.001) and reduced risk of fatality (IRR=0.785; 95%CI: 0.77-0.80; p<0.001); no differences in severity or fatality risk between accidental and unknown/ambiguous events (p>0.05). Compared to accidental events, relative risk decreased as age increased for both unknown/ambiguous events (RRR=0.98; 95%CI:0.983-0.986; p<0.001) and suicide events (RRR=.969; 95%CI:0.967-0.970; p<0.001). Those identifying as Black or other races were at greater risk for unknown/ambiguous events (RRR=1.22; 95%CI:1.10-1.35; p<0.001), compared to suicide, but at less risk of suicide (RRR=.872; 95%CI:0.793-0.959; p<0.01) compared to accidental events.

Conclusions: This is the first known, nationally representative work to disaggregate opioid overdose by event intentionality, including prevalence trends and differences by demographics. Future work should continue to explore the intersection of opioid overdose and suicide, including demographic differences and case trajectories.

ACCEPTABILITY AND INTERVENTION FIDELITY OF OVERDOSE EDUCATION AND NALOXONE DISTRIBUTION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Prevention
Abstract Category: Original Research
Aim: The dire need for overdose harm-reduction led to the wide implementation of Overdose Education and Naloxone Distribution (OEND) programs without empirical studies to maximize their effectiveness. This study sought to examine the complexity of disseminating sustainable OEND by exploring the association between implementation outcomes and intervention outcomes.

Methods: Forty trainees (34% female) were recruited from a community OEND group-training (N=29, one trainer) and from a program providing services to opioid users (N=11, individual trainings, four different trainers). Implementation outcomes were intervention fidelity – competence in conducting the intervention (Competence Scale, range 0-42), and adherence to the protocol (Adherence Scale, range 0-17) – as well as acceptability (Acceptability of Intervention Measure, range 0-5). We assessed fidelity from the perspectives of trainees, trainers, and an independent observer. Intervention outcomes were trainees' Opioid Overdose Knowledge Scale (OOKS) and Opioid Overdose Attitude Scale (OOAS) scores. We hypothesized that higher intervention fidelity and acceptability would be associated with improved overdose knowledge and attitudes.

Results: OOAS scores, t(35)=9.8, p<.001, and OOKS scores, t(38)=10.8, p<.001, significantly increased from pre- to post-training. Acceptability of OEND was rated high among trainees (M=4.6, SD=0.6) and trainers (M=4.9, SD=0.1). Trainees rated trainers' adherence (M=16.8, SD=0.9) and competence (M=32.0, SD=7.5) highly. Trainees' adherence ratings correlated medium-to-high with both trainers' self-ratings [r=.38, p=.03] and observer ratings [r=.74,

p<.001]. Trainee ratings of implementation outcomes (adherence, competence, and acceptability) were associated with post-training OOAS scores, $F_{(3,33)}=7.7$, $p<.001$, $R2=.41$. However, only acceptability ratings added significantly to this model, $p<.001$. Similarly, trainee ratings of implementation outcomes were associated with post-training overdose prevention knowledge (OOKS), $F_{(3,33)}=4.6$, $p=.008$, $R2=.30$, with acceptability driving this model, $p=.009$.

Conclusions: OEND was well accepted and trainers' intervention fidelity was rated high from all perspectives. Emphasis should be on maintaining high acceptability of OEND, particularly when designing new training curricula, as this may affect program effectiveness.

A STATEWIDE PHARMACIST SURVEY ON STANDING ORDER NALOXONE IN MASSACHUSETTS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Policy
Abstract Category: Original Research

Aim: Massachusetts implemented a policy in 2014 allowing retail pharmacies to obtain a standing order to dispense naloxone. In 2017, a statewide standing order was issued, and naloxone dispensing became mandatory. We surveyed pharmacists to differentiate the characteristics of "early" (pre-2017 policy change) vs. "late" standing order adopters, with the goal of informing interventions to promote voluntary dispensing in other states.

Methods: We generated a stratified random sample of 200 early and 200 late adopters from 1,096 retail pharmacies in Massachusetts and attempted a brief (<10 minutes) interviewer-administered survey with one pharmacist at each pharmacy between April and August 2019. We generated descriptive statistics and used chi-square and t-tests to assess differences across the two groups.

Results: Of 339 pharmacists surveyed, 207 (61%) were female. Pharmacists at late-adopting pharmacies were older than those at early adopter pharmacies (median age 43 vs. 38 years, p<0.001) and had more pharmacy experience (median 8 vs. 6 years, p<0.001), but we found no differences by pharmacy type (chain vs. independent), community type (urban vs. rural), or other characteristics, including pharmacists' knowledge, attitudes, and beliefs regarding naloxone. A majority in each group felt comfortable delivering state-mandated naloxone counseling (98% vs. 93%; p=.318) and asking prescription opioid patients if they wanted naloxone (94% vs. 95%; p=.379). With regard to patient utilization, most believed that stigma (78%) and cost (74%) are barriers to purchasing, with no significant differences across groups.

Conclusions: Two years after naloxone dispensing was mandated in Massachusetts, we found that the majority of pharmacists held favorable views toward naloxone and were comfortable offering naloxone and related counseling. We identified few differences between early and late adopters, suggesting more research is needed to characterize pharmacies reticent to engage in voluntary naloxone standing order dispensing.

SUBSTANCE USE AND HARM REDUCTION STRATEGIES AMONG CONSTRUCTION WORKS IN NYC: A QUALITATIVE STUDY

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Abstract Detail: Human
Drug Category: Other, Multiple drugs
Topic: Behavior
Abstract Category: Original Research
Aim: To understand substance use and harm reduction strategies among construction workers. Previous research documents higher prevalence of marijuana, cocaine, and nonmedical prescription opioid (NPO) use among construction workers (CWs) as compared to other workers.
Methods: We interviewed 28 English-speaking CWs aged ≥18 years' old who worked in construction in the last three years. Interviews were recorded, transcribed and analyzed thematically using grounded theory. The sample was 93% male, 64% Black, 18% white, 21% union membership, and the mean age was 41.6 (range:22-64).
Results: The most commonly reported substances were alcohol, marijuana, cocaine, heroin, and NPOs. Use occurred both outside of work hours and on the job, typically during breaks. NPO use by coworkers was reported as surreptitious and difficult to determine if use was for medical or nonmedical purposes. In terms of harm reduction, CWs described restricting use to non-work hours or lunch breaks. Some CWs described "functional drug use" among coworkers, whereas others felt drunk or high CWs presented a safety risk. While some reported substance use to their supervisors, others were reluctant to intervene or tell their supervisors unless they perceived someone was a safety risk. The reluctance stemmed from a desire to "mind their business" and/or concern over the consequences including suspension or termination. CWs described "pulling up" a co-worker or being "pulled up" themselves when impairment was noticed (i.e., working slow, acting erratically) – this might include a look or suggesting that the person take a break to get themselves together.
Conclusions: These preliminary findings suggest that CWs are concerned about working with impaired co-workers. Some employ harm reduction techniques to protect themselves and their co-workers. Future studies are warranted to determine risk factors for substance use in this occupational group as well as the effectiveness of these harm reduction strategies.

OVERDOSE RISK AMONG OPIOID USERS IN NEW JERSEY: THE ROLE OF FENTANYL AND NALOXONE

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: The proliferation of illicitly manufactured fentanyl has driven recent increases in opioid overdose deaths, with deaths involving synthetic opioids other than methadone increasing by 71% annually from 2013 to 2017. While states have increased public access to the overdose-reversal medication naloxone, some fear that expanded naloxone availability may have the unintended consequences of encouraging risky drug use and reducing incentives to quit. To address research gaps in our understanding of the perceptions and behaviors of opioid users (OU) in the rapidly changing drug-use environment, this study examined OU's beliefs and behaviors surrounding fentanyl and naloxone and their association with overdose risk.

Methods: We surveyed a cross-sectional sample of 440 recent and active male and female OUs in NJ methadone and residential detoxification clinics. Survey items were derived from a prior qualitative study exploring opioid overdose risk factors. Using chi-square analysis and logistic regression, we examined the association between overdosing in the last two years and beliefs and behaviors surrounding fentanyl and naloxone.

Results: Although most respondents (80%) associated fentanyl with overdose risk, 40% had knowingly used fentanyl and 38% actively sought drugs causing overdose or death. Most respondents were aware of naloxone (87%) but only 13% reported greater naloxone-related risk-taking. In multivariate analyses, endorsing naloxone-related risk behavior more than doubled the risk of overdose after controlling for other known risk factors (AOR=2.30; p=.038). After adjusting for scores on a scale of fentanyl-seeking attitudes and behaviors, however, naloxone risk-taking became insignificant while each unit increase in fentanyl-seeking attitudes/behaviors significantly increased the risk of overdose (AOR=1.22; p=.017).

Conclusions: Fentanyl-seeking attitudes and behaviors were significantly associated with overdose risk and mediated the relationship between overdose and naloxone-related risk-taking. As long as demand for fentanyl remains high, harm reduction strategies to increase OU's awareness and identification of fentanyl-contaminated products may be less effective than opioid treatment.

EXPLORING A COMPLEX RELATIONSHIP: A QUALITATIVE STUDY OF SUBSTANCE USE AND HOMELESSNESS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Prevention
Abstract Category: Original Research
Aim: To examine the interrelationships between homelessness and substance use among emergency department (ED) patients using in-depth qualitative interviews. We hypothesized that interview findings would suggest a bidirectional relationship between homelessness and substance use.
Methods: We conducted in-depth, one-on-one interviews with 31 ED patients who had become homeless within the past 6 months. Using a semi-structured interview guide, we asked patients about the relationship between their substance use and homelessness. Interviews, on average lasting 42 minutes, were digitally recorded and professionally transcribed. Transcripts were coded line-by-line by 2-3 investigators, who discussed and refined codes in an iterative fashion.

The codes then formed the basis for thematic analysis and consensus discussions. Dedoose, a qualitative research web application, was used to assist with data organization.

Results: Of the 31 patients interviewed, 54.8% reported unhealthy alcohol use and 41.9% drug use in the past year; for others, substance use was only in the past. Five themes emerged: 1) Substance use often contributes to homelessness as an upstream factor, through varied intermediary factors (e.g., job loss, family discord, rental issues); 2) Homelessness affects substance use variably, both increasing (e.g., due to depression) and decreasing (e.g., due to lack of time and money) substance use; 3) Substance use and homelessness sometimes share precipitants, often related to interpersonal factors; 4) Substance use creates practical and environmental barriers relevant to homelessness (e.g., avoiding shelters that might trigger relapse); 5) Homelessness can both promote and hinder entry into substance use treatment (e.g., may motivate "change").

Conclusions: Substance use and homelessness are intertwined in complex ways. ED-based substance use interventions should consider the variable ways in which homelessness affects substance use and vice versa, particularly given the high prevalence of homelessness in this population.

FACTOR ANALYSIS OF A SCALE TO ASSESS BARRIERS TO PRE-EXPOSURE PROPHYLAXIS WILLINGNESS AMONG A SAMPLE OF PEOPLE WHO INJECT DRUGS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Prevention
Abstract Category: Original Research

Aim: Pre-Exposure Prophylaxis (PrEP) for HIV prevention is an evidence-based intervention that if taken daily, can reduce the likelihood of HIV seroconversion, however, uptake among people who inject drugs (PWID) remains low. Testing and analyzing a new scale assessing barriers to willingness to use PrEP is important for future research surrounding PrEP acceptability and utilization among this population.

Methods: PWID were recruited in Los Angeles and San Francisco, from 2016-2017. Only those who answered the eight PrEP barrier items, and who were HIV negative and not using PrEP were included (N = 276) in the factor analysis. Exploratory factor analysis (EFA) was conducted to determine the factor structure of the 8 binary-item PrEP barriers scale, and factor loadings and eigenvalues were examined. Reliability of the final proposed scale was assessed via computation of Cronbach's alpha.

Results: In both rotated and unrotated principal factors analysis, one factor was shown to be the best solution, explaining 93.4% of variance among items. Using a factor loading cutoff of 0.4, seven of eight items were retained during the EFA. After the elimination of this item, reliability of the new 7-item scale was good ($\alpha = 0.75$). As the scale is unidimensional, we have termed the single underlying construct "barriers to willingness to take PrEP".

Conclusions: This EFA shows that this brief unidimensional scale to assess potential barriers to PrEP willingness has value for use among PWID populations in the context of HIV research, with higher scale values indicating a lower overall barrier to use. Further refinement of item

wording may increase reliability. Future research could use this scale to determine the overall role of these barriers in PrEP enrollment.

NEW SYNTHETIC OPIOIDS USE IN DIFFERENT OPIOID TREATMENT AND HARM REDUCTION SETTINGS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research
Aim: In order to respond to the public health challenge that poses the increase in overdose deaths involving new synthetic opioids (NSO), there is a need of describing the users, their wellbeing and the possible implications on prevention and treatment. The aim of this study is to know the use of NSO and the reason of its use in a sample of opioid users from different opioid treatment and harm reduction settings.
Methods: Persons with opioid use (inpatients, outpatients and non-seeking treatment users in harm reduction facilities) attending PSMAR addiction services. The assessment included: Ad-hoc interview with sociodemographic, clinical and drug use data (15 items), 14 reasons for choosing the NSO (Likert scale), Wellbeing Index (WHO-5).
Results: At present a total of 89 subjects were included, 70% were men. Mean age was 48 years and 83% were from Spanish origin. Regarding clinical variables, 90% were in treatment for opioid use disorder. Age for first treatment was 29 years and the main drug of use was heroin (76%). A 17% of the sample reported any NSO use in the last 3 months, being fentanyl the most used (7%), followed by tramadol (5%). The main reasons to use NSO were availability, replacing other drugs and lower price.
Conclusions: In our sample, a 17% of opioid users reported any NSO use in the last 3 months. Most NSO consumed was fentanyl and the main reason for its use was its availability. Further studies with large size are needed to confirm these preliminary results.

OPIOID USE AND RESCUE BEHAVIORS OF LAY RESPONDERS IN AN APP-BASED OVERDOSE PREVENTION INTERVENTION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research
Aim: Lay first responders, regardless of opioid misuse, are amenable to overdose prevention training and undertaking recommended responses, including naloxone use or 911 calls. Less is known, however, about whether opioid misuse affects engagement in rescue behaviors, including use of overdose prevention smartphone applications. We examined differences in use of an overdose prevention app (UnityPhilly) among lay responders with and without active opioid use.
Methods: The study took place in the Kensington neighborhood of Philadelphia, the epicenter of the local overdose epidemic. In 2018-2019, 97 people of both sexes residing/working in Kensington were enrolled in a prospective study piloting the use of UnityPhilly. The app allowed: 1) sending an overdose alert to nearby participants while simultaneously calling 911, and 2) responding to an overdose alert and navigation to the scene. At baseline, all participants were trained in overdose prevention and app use. Participants were grouped into community members (54%) or non-medical opioid users (46%) based on past 30-day opioid misuse. Logistic regression estimated associations between opioid misuse and rescue behaviors.
Results: Most participants reported lifetime witnessing (95%) or experiencing (52%) an overdose. In the 9 months since app activation, 37% signaled overdose alerts using UnityPhilly and 22% responded to overdose alerts and arrived on-scene. The proportions of signaled overdose alerts did not differ between community members (35%) and opioid users (40%). Community members (37%), however, were more likely to respond to UnityPhilly overdose alerts compared to opioid users (4%) (p<.001). Lifetime witnessing or experiencing an overdose was not associated with rescue behaviors.
Conclusions: Current opioid use did not interfere with the participants' ability to signal an overdose alert using UnityPhilly. Active opioid users, however, less frequently responded/arrived on-scene using UnityPhilly, which requires further investigation. App-based overdose interventions should include multiple types of lay first responders to increase the likelihood of response to overdose emergencies.

ASSESSING HIV AND OVERDOSE RISK OUTCOMES OF INDIVIDUALS UNDER COMPULSORY DRUG ABSTINENCE PROGRAMS (CDAP): A SYSTEMATIC REVIEW AND META-ANALYSIS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Literature Review
Aim: Compulsory drug abstinence programs (CDAP) are increasing in number and scope to address addiction in the US and many global settings. For people with opioid use disorder, CDAPs are often deployed in lieu of opioid agonist therapy (OAT), despite growing evidence of individual and society-level harms. We conducted a systematic review and meta-analysis to evaluate the association between CDAP exposure and related HIV and overdose risks among people who use or inject drugs (PWUD & PWID).

Methods: From June-September 2019, we conducted two searches of PubMed, EBSCOhost and Sociological Abstracts bibliographic databases, one search with terms related to HIV-risk factors and the other with overdose-risk terms, without geographic, language, or date restrictions. Articles that reported associations between exposure to CDAP (defined as involuntary, non-evidence-based treatment programs, either extrajudicial or state-mandated) and related HIV or overdose risks among PWUD & PWID were included in the systematic review. Meta-analytic methods were used to quantify reported outcomes, and random-effects models for studies that reported the same timeframe for CDAP exposure and outcomes, using a random-effects model.

Results: The systematic review included 11 studies, 6 reporting data on HIV risks factors and 5 reporting overdose data. Current or previous exposure to CDAP was associated with a 46% increase in HIV seroprevalence at time of survey (95% CI 0.1-21.14,n=3 studies), though with substantial heterogeneity ($t^2=0.9$). There was some evidence that exposure to CDAP was associated with a 14% increased odds in syringe sharing ever or in the last 6 months (95% CI 0.9-1.6,n=3 studies,$t^2=0.0054$). Our pooled analysis of two studies reporting lifetime non-fatal overdose events found that exposure to CDAP was associated with a 40% increase in risk of ever experiencing a non-fatal overdose (95% CI 1.23-1.6,n=2 studies,$t^2<0.001$).

Conclusions: Exposure to CDAP was associated with increased risk of syringe sharing and non-fatal overdose among PWUD & PWID, which are strong predictors of HIV infection and fatal overdose, respectively. Instead of CDAP, resources should be directed towards evidence-based harm reduction and treatment services for PWUD & PWID, especially voluntary OAT.

OPIOID OVERDOSE PREVENTION AND RESPONSE TRAINING IMPROVES KNOWLEDGE AND ATTITUDES TOWARD OPIOID OVERDOSE AND NALOXONE USE IN FIRST YEAR MEDICAL STUDENTS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research
Aim: Efforts are underway to increase naloxone distribution to reduce opioid overdose deaths; however, negative attitudes of healthcare workers may reduce patient access. Our initial study at Wayne State School of Medicine (WSU-SOM) found Opioid Overdose Prevention and Response Training (OOPRT) improved student attitudes and knowledge in responding to overdoses. This longitudinal study explores impacts of medical student OOPRT toward identifying the ideal time and method for instruction.

Methods: We are following the WSU-SOM Class of 2023 yearly throughout training to monitor changes in attitudes and behaviors surrounding opioid use, opioid use disorder treatment, and overdose prevention. At matriculation, all medical students (N=296) were asked to complete a baseline survey. Approximately 1-month later, 50% of the class received OOPRT (the other 50% [waitlist control] will receive training at the start of year 3) and a post-training survey that included the Opioid Overdose Knowledge (OOKS), Opioid Overdose Attitudes (OOAS), and Naloxone-Related Risk Compensation.

Results: 124 students of the 144 students who attended the training (mean age 23.3±2.2 years; 50% female; 62.1% Caucasian) completed baseline and post-training surveys. Of those, 95.2%

indicated they enjoyed the training and 98.4% suggested all students should receive training. We found significant improvements in knowledge in 8 of the 9 OOKS subscales and total score (t(123)=24.57; p<.0001) and improvements in opioid overdose attitudes in 2 of the 3 OOAS measures and total score (t(123)=17.39; p<.0001). We also found improvements in all 5 of the measures of beliefs related to naloxone-related risk compensation.

Conclusions: OOPRT increased opioid overdose knowledge, ratings of personal ability to help someone experiencing opioid overdose, and attitudes toward naloxone risk. Further research is needed to establish the training's long-term efficacy and possible clinical impact.

PRE-HOSPITAL OPIOID OVERDOSE CASES: DAY-TIME DISTRIBUTION AND ACCURACY OF USING 9-1-1 COMPUTER ASSISTED DISPATCH AND PATIENT CLINICAL RECORD VARIABLES FOR IDENTIFICATION OF CASES

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: We described patterns of opioid overdoses (ODs) in a small western region using data from the 9-1-1 Computer Assisted Dispatch (CAD) record and electronic Patient Clinical Records (ePCR) completed by EMS responders. We sought to determine whether CAD and ePCR variables could identify OD cases in 9-1-1 data, which could inform surveillance and intervention efforts.

Methods: We conducted a retrospective analysis of one year of 9-1-1 emergency medical CAD and ePCR data from the sole EMS provider in the response area. Cases were identified based on clinician review of the ePCR, and categorized as definitive-, probable-, or non-OD. We described cases by CAD and ePCR variables, time and day of presentation, and naloxone administration by EMS personnel. Sensitivity, specificity, positive and negative predictive values of the most prevalent CAD variables were calculated.

Results: Of 37,960 9-1-1 calls, clinical review identified 158 OD cases (0.4%), of which 123 (77.8%) were definitive and 35 (22.2%) were probable cases. Rate of overdoses/1000 calls was highest on Mondays (5.4), Tuesdays (4.7), and 9pm (7.2) through 12am (8.3). Overall, 106 (67.1%) received naloxone from the EMS responder at the scene. The most common CAD variables assigned to OD cases were cardiopulmonary arrest (31.6%), overdose/poisoning (26.6%) and unconsciousness (20.3%). Sensitivity, specificity, positive and negative predictive values respectively were 31.6%, 98%, 6.2% and 99.7% for cardiopulmonary arrest; 26.6%, 98.4%, 6.4% and 99.7% for overdose/poisoning; 20.3%, 93.6%, 1.3% and 99.6% for unconsciousness; and 67.1%, 99.7%, 44% and 99.9% for receiving naloxone from EMS personnel.

Conclusions: Patterns of day-time clustering of OD cases have implications for deployment of interventionists to the scene or the emergency department. Use of CAD variables alone was highly predictive of non-ODs but not for OD cases. To optimize 9-1-1 OD reporting and inform intervention efforts, more sensitive predictors of OD events are needed.

VIDEO TO INCREASE NALOXONE UPTAKE AND USE AMONG PWUO WHO DECLINE

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Prevention
Abstract Category: Original Research

Aim: Although naloxone enables community members to reliably reverse overdose events, and take-home naloxone kits are frequently offered free of charge to those at most risk, many people who use opioids (PWUO) decline kits when offered, or report trepidation about using them. Our team's previous research indicates 40% of PWUO declined free naloxone kits offered at a New York City syringe exchange program (SEP). The current study aims to understand why PWUO decline naloxone, and how technology-based intervention materials can potentially increase naloxone acceptance along with likelihood of use.

Methods: Experienced qualitative researchers recorded semi-structured audio interviews with 39 current opioid users, recruited in public New York City spaces where PWUO congregate. Questions examined why people might not accept, carry or use naloxone, and what other methods people might employ to reverse an overdose. Interviews were jointly coded and analyzed to identify emerging themes.

Results: Data indicate concerns about being stigmatized as a "junkie" for accepting or carrying naloxone, and/or fear of inducing withdrawal symptoms by administering naloxone. Interview participants also frequently said opioid overdose could be reversed by other means (e.g. slapping someone; applying ice to genitals; or injecting other substances, i.e. cocaine, to counter an opioid's effect). Data show messages delivered by someone perceived as experienced with opioids will be received more positively compared to messages spoken by medical professionals or law enforcement

Conclusions: Interventions must address opioid-related stigma by underscoring the positive role of PWUO who reverse overdose events; and emphasize that carrying naloxone does not mark someone as a "drug addict," but instead shows a person cares about the lives of those around them. Messages must also address any apprehension people have about using naloxone, describe ways to discretely carry the medication and cover how to deal with potential opioid withdrawal symptoms following naloxone administration.

Imaging

CANNABIS USE DISORDER (CUD) INDIVIDUALS WITH PRIOR TRAUMA SHOW HEIGHTENED AMYGDALA REACTIVITY TO BACKWARD-MASKED AVERSIVE CUES

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids

Topic: Imaging

Abstract Category: Original Research

Aim: Cannabis use disorders (CUDs) are the most prevalent of the illicit substance use disorders (SUDs) and are associated with numerous mental health problems. Research suggests that trauma exposure contributes to brain and behavioral vulnerabilities underlying cannabis use and the development of CUDs. However, the impact of trauma on brain function among CUD individuals has not been well examined. Amygdala activity frequently associates with increased posttraumatic stress and may be over-active among those with CUD that have experienced trauma. We therefore tested the hypothesis that trauma-exposed CUD individuals would show greater amygdala reactivity to aversive cues relative to CUD individuals with no prior trauma history.

Methods: In the context of a larger treatment-outcome study, the present study used fMRI and an event-related BOLD backward-masking task to examine amygdala reactivity to aversive cues (vs. neutral) among CUD individuals with (n = 23) and without trauma (n = 19).

Results: Direct comparisons revealed that CUD-Trauma subjects showed greater amygdala response to backward-masked aversive cues (p < .005, cluster corrected). Further, a positive correlation was observed between self-reported emotion regulation difficulties and amygdala response (r = .33, p = 0.04).

Conclusions: Together, results suggest that trauma enhances amygdala's sensitivity to aversive cues, and as such, may offer a neural explanation for trauma victims' heighted risk for cannabis use and CUD. The amygdala is involved in fear-detection and rapid response to threat. Thus, enhanced amygdala activity may represent a biomarker of relapse vulnerability wherein, when an individual experiences fear or threat, they instinctually use cannabis to down-regulate such emotions. These findings highlight the importance of considering trauma history in treatment planning, as this distinction may influence relapse vulnerability for a subgroup of CUD individuals.

WHEN IT TAKES MORE BRAIN TO DO THE SAME (JOB): COCAINE PATIENTS CARRYING A GENETIC ALLELE LINKED TO CORTISOL SYSTEM OVER-RESPONSE SHOW WIDESPREAD BRAIN ACTIVATION DURING SUCCESSFUL INHIBITION IN THE "SPIDERS-NO!, PUPPIES-GO!" PROBE

Anna Childress[1], Richard Crist[1], Kanchana Jagannathan[1], Paul Regier[1], Jesse Suh[1], Stefanie Darnley[1], Matthew Taylor[1], Zach Monge[2], Teresa Franklin[1], Reagan Wetherill[1], Daniel Langleben[1], Kimberly Young[1], Michael Gawrysiak[1], Regina Szucs-Reed[1], Kyle Kampman[1], Charles O'Brien[1]*

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Abstract Detail: Human

Drug Category: Stimulants

Topic: Imaging

Abstract Category: Original Research

Aim: Chronic stress (in animals and in humans) can erode the brain's "brakes", the ability to inhibit responding to strong stimuli (whether negative or positive). Part of the brain's response to stress is under genetic control, with an FKBP5 gene variant (minor allele of rs3800373) linked to an over-response of the cortisol stress system. We tested whether this ("hyper-cortisol") genetic variant might impact the brain's response during successful inhibition by comparing cocaine patients with, and without, the

Methods: Study participants were treatment-seeking cocaine inpatients (African American males; mid-40's) who received a BOLD fMRI session at 3T, with probes that included our novel "Spiders – NO!, Puppies - GO!" Affect Congruent Go-NoGo task. Focusing on successful inhibition, first-level contrasts (SPM 12) compared the brain response during successful (STOPS) vs. failed (ERRORS) inhibition trials. The second-level group contrast compared carriers of the "vulnerability" minor G allele for rs3800373 of FKBP5 (TG, GG; n=14), vs. the TT homozygotes (n=12).

Results: During successful inhibition, cocaine patients with the genetic variant (TG,GG) linked to hyper-cortisol responding recruited a dramatic, widespread pattern of brain activation, including subcortical (striatum, pallidum/amygdala), cortical (inf. frontal, d. l. prefrontal, l. orbitofrontal, d. cingulate, p. cingulate), and visual regions (statistical parametric T maps thresholded $2<t<5$ for initial examination). In contrast, TT homozygotes activated only circumscribed areas of the putamen/pallidum/r.amyg, and d.l.prefrontal cortex.

Conclusions: Cocaine patients carrying the "hyper-cortisol" vulnerability alleles of FKBP5 required "much more brain" activation to achieve successful inhibition, whereas the TT homozygotes efficiently achieved successful inhibition using only small focal activations in the subcortical and cortical circuitry. Chronic over-response of the cortisol system to strong stimuli (e.g., stress or drugs of abuse) may have eroded efficient inhibition for the G carriers – creating a potential relapse vulnerability, but also highlighting novel (gene-level) targets for future intervention.

EXPLORING THE UTILITY OF A FUNCTIONAL MAGNETIC RESONANCE IMAGING (FMRI) CUE-REACTIVITY PARADIGM IN TREATMENT SEEKING ADULTS WITH CANNABIS USE DISORDER

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Imaging
Abstract Category: Original Research
Aim: Several studies have used functional magnetic resonance imaging (fMRI) to examine the neural activation patterns associated with cue-reactivity in cannabis use disorder (CUD). Investigations to date, however, have either been small or involved non-treatment seeking individuals. We extend this work by applying a previously developed visual cue-reactivity paradigm (Karoly et al., 2019) to rigorously screened CUD participants before entering one of two treatment trials (NCT02892110, NCT03144232).

Methods: Participants with moderate or severe CUD underwent a series of behavioral evaluations, including spontaneous craving via the Marijuana Craving Questionnaire (MCQ-SF). They additionally underwent an fMRI visual cannabis cue-reactivity paradigm following 24-hours of abstinence. During fMRI, the Blood Oxygen Level Dependent (BOLD) signal was acquired while participants viewed cannabis-related or neutral images, matched by color, hue, and visual complexity. BOLD responses were correlated with the MCQ using Spearman correlation coefficients.

Results: N=65 participants (21 women; mean age 30.4±9.9SD) averaged 46.3±15.5SD on the MCQ-SF. When contrasting cannabis-related vs. neutral images, CUD participants showed

greater BOLD response bilaterally in the ventromedial prefrontal cortex, dorsolateral prefrontal cortex, anterior cingulate cortex, striatum, and visual cortex. Similarly, there was stronger task-based functional connectivity (tbFC) between the medial prefrontal cortex and both the amygdala and the visual cortex when viewing cannabis-related, as compared to, neutral images. There were no significant differences in BOLD activation or tbFC between studies or between genders. Craving correlated with BOLD response in the left ventral striatum (rho=-0.26; p<0.04).

Conclusions: We found that in two separate treatment-seeking CUD groups, this fMRI task elicited greater activation and connectivity in regions related to cue-reactivity and reward processing. These findings are consistent with both preclinical and clinical models of addiction. Future directions include examining if pharmacological, neuromodulatory, or psychosocial interventions can alter these activation patterns.

TRIPLE NETWORK RESTING STATE CONNECTIVITY PREDICTS DISTRESS TOLERANCE AND IS ASSOCIATED WITH COCAINE USE

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Imaging
Abstract Category: Original Research

Aim: Distress tolerance (DT), a predictor of substance use treatment retention and post-treatment relapse, is associated with neural activation during stress in regions located within the salience (SN), default mode (DMN), and executive control networks (ECN). The impact of network connectivity on DT has yet to be investigated. The aim of the present study was to test within and between network resting-state functional connectivity (rsFC) associations with DT and cocaine use.

Methods: Twenty-nine adults (Mage =41.31±8.04, 93% male, 79% Black/African American, 17% Caucasian, 3% Other MIQ=101.56±11.88) reporting regular cocaine use (CU) and 28 matched healthy control individuals (HC; Mage=39.57±8.90, 61% male, 75% Black/African American, 18% Caucasian, 4% Hispanic, MIQ=106.29±12.75) underwent resting-state functional magnetic resonance imaging followed by the completion of two counterbalanced, computerized DT tasks. Dual-regression analysis was used to derive within and between network rsFC of the SN, DMN, and lateralized (left and right) ECN. Cox proportional-hazards survival models were used to test the interactive effect of rsFC and group on DT. The association between cocaine use severity, rsFC, and DT was tested within the CU group.

Results: Lower LECN (HR = 0.63; p = 0.005; 95% CI = 0.45-0.87) and higher DMN-SN (HR = 1.65; p = 0.01; 95% CI = 1.12-2.43), rsFC were associated with DT impairment. Greater amount of cocaine use per using day was associated with greater DMN-SN rsFC (B = 1.15, SE = 0.47, 95% CI = 0.18, 2.12, p = 0.02).

Conclusions: Findings emphasize the role of resting state neural resource allocation within the ECN and between DMN-SN on DT and provide empirical support linking DT to theoretically-derived neurobiological models of substance use disorder.

FUNCTIONAL NETWORKS OF COGNITIVE CONTROL IN COCAINE USERS BEFORE AND AFTER TREATMENT

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Treatment
Abstract Category: Original Research

Aim: Aim: Investigating changes after substance-use treatment in functional brain networks associated with cognitive control may provide insight into mechanisms of recovery.
Methods: Methods: Forty-four individuals with cocaine-use disorder (age 40±8, 20 female) completed an fMRI Stroop task at the beginning of and after clinical trials of substance-use treatments. Independent component analysis (ICA) was performed to identify functional networks associated with cognitive control. Linear mixed models were performed to test for change in network engagement at post-treatment relative to baseline and examine relationships with baseline clinical measures (i.e., lifetime cocaine use, concurrent methadone maintenance) and treatment outcomes (i.e., reduction in cocaine use and abstinence achievement after 12-months).
Results: Results: Reductions in cocaine use during treatment were associated with reduced engagement of a medial frontal network during Stroop performance at post-treatment ($F_{1,42}=4.5$, $p<.05$). Individuals achieving sustained cocaine abstinence at 12-months displayed reduced engagement of a bilateral middle frontal network at post-treatment relative to baseline ($F_{1,42}=4.21$, $p<.05$). Reductions in engagement of an amygdala-striatal ($F_{1,42} = 8.3$, $p <.01$) network at post-treatment were observed, but not associated with treatment outcomes. Less change in the amygdala-striatal network was associated with greater lifetime years of cocaine use ($r=.33$, $p<.03$). There were no alterations in engagement of right or left-lateralized frontoparietal networks following treatment.
Conclusions: Conclusion: Post-treatment reductions in cognitive-control-related engagement of functional networks linked to conflict processing and inhibitory control were associated with reduced cocaine use and abstinence through follow-up. Engagement of a motivation-related network was also reduced following treatment, though change was limited in individuals with longer disease histories. These results highlight potential mechanisms of therapeutic change in cocaine use disorder and highlight the importance of early intervention.

NEUROFUNCTIONAL TARGETING OF TRANSCRANIAL MAGNETIC STIMULATION (TMS) IN SUBSTANCE USE DISORDER RESEARCH AND TREATMENT

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Imaging
Abstract Category: Original Research

Aim: Transcranial magnetic stimulation (TMS) holds promise as a research and treatment tool for substance use disorder (SUD). Neurotargeting with TMS typically relies on external landmarks to set stimulation trajectories, which does not account for individual variability in brain structure or function. To better understand individual variability as it may relate to TMS efficacy, we are quantifying the relationship between externally guided and neurofunctionally guided TMS landmarks in an ongoing SUD study.

Methods: Heavy cannabis users (n=7) with a mean (+/-S.D.) age of 21.4 (4.9) participated. Structural and functional MRI data were acquired during reinforcement learning and working memory tasks. For each participant, data were preprocessed using standard procedures, including spatial normalization. Brain activity associated with winning money and working memory was isolated within a left dorsal lateral prefrontal cortex (DLPFC) search volume (p < 0.01, corrected). Reverse transformations converted the external EEG f3 (f3) landmark as well as structural and functional results into individualized head space. A TMS trajectory was built from the functional overlap of task activations to the skin. Millimeter (mm) distance was calculated between f3 and the new skin target (SkT), as well as for both f3 and SkT to grey matter (GM), and SkT to the functional overlap target (FOT).

Results: The mean (+/-S.D.) distance from f3 to SkT was 17.46mm (10.2), which significantly differed from zero, $t(6)=4.55$, $p=0.004$. The distance from f3 to GM and SkT to GM was 12.61mm (3.7) and 10.84mm (3.7), respectfully, which did not significantly differ. Lastly, the distance from SkT to FOT was 22.14mm (5.2).

Conclusions: These data show that neurofunctionally guided TMS trajectories from the left DLPFC can result in spatially distinct skin targets, compared to an externally guided landmark. They indicate that efforts to modulate context-specific brain function in individuals with SUD may benefit from neuronavigation.

CANNABIS USE AMONG EMERGING ADULTS IS LINKED WITH ALTERED INSULA ACTIVITY DURING EFFORT-BASED DECISION-MAKING

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Imaging
Abstract Category: Original Research

Aim: Popular culture and anecdotal evidence often link cannabis use with reduced motivation promulgating the amotivated "slacker stoner" stereotype. Despite an association with lower achievement, evidence linking cannabis use and amotivation is lacking. Using an effort-based decision-making task, we assessed differences in brain activity between groups of heavy cannabis users and non-users during the integration of effort and reward information.

Methods: We assessed 14 emerging adults across two groups (users [n=8], non-users [n=6]) in a pilot study while they completed an fMRI version of the Effort Expenditure for Rewards Task [1]. During scanning, participants made decisions to accept or reject different proposed scenarios. Participants were presented with 2 separate cues, one indicating the level of effort required and the other indicating a varying amount of potential monetary reward. Effort and reward cue orders were counterbalanced across the task. The main contrast of interest was the difference in brain activity between Cue-2 versus Cue-1, a contrast capturing the integration of effort and reward information (FWE cluster-corrected: $p<0.05$). We employed two strategies

to probe for cannabis-related effects within task-defined regions of interest, a between-groups and a correlational assessment.

Results: We identified task-effects in the right insula, supplemental motor area (SMA), and right parietal cortex linked with the integration of effort and reward information. In the insula, we observed robust user versus non-user differences (d=1.3) such that increased insula activity was positively correlated with lifetime cannabis use (days used: R2=0.5; amount used: R2=0.4). Similar outcomes were observed within the SMA. Indicative of regional specificity, activity in the parietal cortex did not yield robust cannabis-related effects in the group (d=0.05) or correlational assessments (days used: R2=0.09; amount used: R2=0.02).

Conclusions: These outcomes indicate that alterations in insula and SMA activity during the integration of effort and reward information may contribute to cannabis-related motivational differences.

MULTIMODAL 7T IMAGING REVEALS HYPERCONNECTIVITY BETWEEN SALIENCE AND FRONTOPARIETAL NETWORKS MEDIATING DECISION MAKING BUT INTACT MICROSTRUCTURAL ARCHITECTURE AND DIFFUSION CONNECTIVITY IN YOUNG ADULT CIGARETTE SMOKERS

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Imaging
Abstract Category: Original Research

Aim: Cigarette smoking is associated with disrupted brain network dynamics in cognitive resting networks including the Salience (SN) and Fronto parietal (FPN). Unified multimodal methods [Resting state connectivity analysis, Diffusion Tensor Imaging (DTI), neurite orientation dispersion and density imaging (NODDI), cortical thickness analysis were employed to test the hypothesis that smokers have deficits in inter temporal DM and these deficits may be due to alterations in white matter (WM) microstructure and connectivity, functional connectivity and cortical thickness (CT) and that these metrics define fundamental differences between smokers and nonsmokers.

Methods: Multimodal analyses of 7-Tesla scanner data were performed on 22 smokers (average cigarettes was 40±4) and 22 age-and sex-matched nonsmoking controls. Subjects scores on the delay discounting test was analyzed. Functional connectivity analysis was used to examine SN-FPN interactions between smokers and nonsmokers. The anatomy of these networks was assessed using DTI, NODDI and CT analyses.

Results: Smokers scored significantly lower on most items within delay discounting task (DD)] except for tasks: subjective value for \$4K at 6m and subjective value for \$4K at 1-year tasks (trend). Relative to nonsmokers, seed-based connectivity analysis revealed significantly enhanced inter network [p = 0.001 FDR corrected]. and between network functional coupling of the salience and R-FP networks in smokers [p = 0.004-FDR corrected]. Functional coupling scores were inversely correlated with DD scores in nonsmokers. The total number of cigarettes smoked strongly correlated with FagerstrÖm Test for Nicotine Dependence scores. Whole brain diffusion analysis revealed no significant differences in white matter.

Conclusions: Our results demonstrate that tobacco cigarette smoking is associated with steeper devaluation of delayed rewards mirrored in enhanced functional connectivity, but anatomy is largely intact in young adults. The observed disrupted salience in resting state networks may

be the reason for steeper discounting in smokers which may contribute to difficulties in quitting and/or facilitating relapse.

THE ACUTE EFFECTS OF NICOTINE ON CORTICOSTRIATAL RESPONSES TO DISTINCT PHASES OF REWARD PROCESSING

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Imaging
Abstract Category: Original Research
Aim: Nicotine enhances the reinforcement of non-drug rewards by increasing nucleus accumbens (NAcc) reactivity to anticipatory cues. This anticipatory effect is selective as no clear evidence has emerged showing that nicotine acutely changes reward receipt reactivity. However, repeated rewarding experiences shifts peak brain reactivity from hedonic reward outcome to the motivational anticipatory cue yielding more habitual cue-induced behavior. Given nicotine's influence on NAcc reactivity and connectivity, it is plausible that nicotine acutely induces this shift and alters NAcc functional connectivity during reward processing.
Methods: To evaluate this currently untested hypothesis, a randomized crossover design was used in which healthy male and female non-smokers (N = 17) were administered placebo and nicotine (2-mg lozenge). Brain activation to monetary reward anticipation and outcome was evaluated using functional magnetic resonance imaging with the monetary incentive delay (MID) task.
Results: Relative to placebo, nicotine induced more NAcc reactivity to reward anticipation (p = 0.031). Greater NAcc activation during anticipation was significantly associated with lower NAcc activation to outcome (r = -0.57; p = 0.018). During outcome, nicotine reduced NAcc functional connectivity with cortical regions including the anterior cingulate cortex (p = 0.0029), orbitofrontal cortex, and insula (p = 0.0098). These regions also showed the same negative relationship between reward anticipation and outcome as noted in the NAcc.
Conclusions: The current findings significantly improve our understanding of how nicotine changes corticostriatal circuit function and communication during distinct phases of reward processing and critically show that these alterations happen acutely following a single dose. The implications of this work extend beyond nicotine dependence as they explain nicotinic modulation of general reward function, which may help explain the strong link between nicotine use and psychiatric disorders associated with reward dysfunction.

SEX DIFFERENCES IN REWARD CIRCUITRY ACTIVATION IN YOUNG ADULTS AT RISK FOR ALCOHOL USE DISORDER

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Imaging
Abstract Category: Original Research

Aim: Sex differences have been observed in reward-related brain areas during adolescence and young adulthood, a time when heavy alcohol use and alcohol use disorders (AUDs) also begin to emerge. Individuals with a family history of AUD are at particularly high risk of developing their own alcohol problems, and altered reward system processing has been shown to contribute to the development of problem alcohol use in these individuals. Therefore, at-risk young adult males and females may differ in their patterns of reward-related neural activity in clinically-significant ways.

Methods: 136 right-handed participants (mean age 19.5 ±1.2 yrs; 51 females) were recruited from the Michigan Longitudinal Study. All participants had at least one parent with a diagnosed AUD. Participants performed a monetary incentive delay task during functional magnetic resonance imaging (fMRI). Contrasts of interest were anticipation of Large Loss vs. Neutral and anticipation of Large Reward vs. Neutral. Because males and females differed on cumulative drink volume at the time of scan, cumulative drink volume was used as a covariate in all fMRI analyses. Participants did not differ on any other substance use variables.

Results: A two-sample t-test (whole-brain analysis) comparing females and males revealed a significant difference for anticipation of Large Loss vs. Neutral in the left middle frontal gyrus (p<.001 uncorrected with a cluster-wise threshold of p<.05 FWE-corrected [x= -28, y=6, z=52; k=298; t=4.49]); activation was greater in females than males. No significant differences were found between the groups for anticipation of Large Reward vs. Neutral.

Conclusions: At-risk females appear to be more sensitive to the anticipation of loss, which is thought to facilitate the avoidance of negative outcomes. Sensitivity to loss may represent a protective neural mechanism which may explain why females and males differ in their risk for heavy alcohol use and AUD.

Nicotine/Tobacco

ADVERSE SCHOOL OUTCOMES AMONG HIGH SCHOOL STUDENTS WITH E-CIGARETTE AND MARIJUANA USE

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Adolescent
Abstract Category: Original Research
Aim: We aimed to describe the associations between single and dual use of e-cigarettes and marijuana and adverse school outcomes in a nationally representative sample of high school students.

Methods: We used data from the two most recent waves (2015/2017) of the Youth Risk Behavior Survey, a self-report pen and paper survey of high school students in the US. Participants (n=30,389) were divided into four exposure groups for past 30-day use of e-cigarettes and marijuana: (1) no use, (2) e-cigarette-only use, (3) marijuana-only use and (4) dual use. We compared rates of e-cigarette and marijuana use for different demographic characteristics using chi-squared tests and performed multivariate logistic regressions exploring associations between e-cigarette and marijuana use and adverse school outcomes. Regression models were adjusted for survey year, grade, gender, race/ethnicity, sexual

orientation and past-year use of alcohol and other substances. Complex sampling design was taken into account and results were weighted to reflect national estimates.

Results: Participants were primarily White (52.9%), Hispanic (22.1%) or non-Hispanic Black (13.2%) and 49.3% were female. E-cigarette-only use was reported in 7.7% of participants, marijuana-only use in 8.5%, and dual e-cigarette/marijuana use in 9.2%. Multivariable analyses revealed that youth with e-cigarette-only use had higher odds of reporting grades that were mostly C's or lower than youth with no use (adjusted odds ratio [AOR] 1.64, 95% confidence interval [CI] 1.43-1.87), which was also observed in youth with marijuana-only use (AOR 1.86, 95%CI 1.60-2.17) and dual use (1.98, 95%CI 1.67-2.35). Similarly, increased AORs were observed for reporting difficulty concentrating, remembering, or making decisions among youth in all three single and dual use groups.

Conclusions: We found increased odds of adverse school outcomes in all three use categories. There is a need for effective screening and education strategies which could help mitigate adverse academic outcomes among students exposed to e-cigarettes and marijuana.

PREDICTORS OF SMOKING CESSATION ATTEMPTS AND SUCCESS FOLLOWING MOTIVATION-PHASE INTERVENTIONS AMONG PEOPLE INITIALLY UNWILLING TO QUIT SMOKING

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Treatment
Abstract Category: Original Research

Aim: Most people who smoke cigarettes are not willing (i.e., not ready or not able) to make a quit attempt at any given point in time. Unfortunately, interventions intended to increase quit attempts and the success of quit attempts are only modestly effective. Identifying processes leading to quit attempts and quitting success could guide intervention development.

Methods: This is a secondary analysis of a randomized factorial trial of 6 weeks of motivation-phase interventions among primary care patients (N=517) who were initially unwilling to quit smoking. Using logistic regression, we controlled for treatment condition and tested whether baseline level or change in smoking-related constructs after 6 weeks of treatment predicted: 1) making a $\geq$ 24 hour quit attempt between weeks 6 and 26, and 2) quitting success at week 26 (7-day point-prevalence abstinence among those who made a quit attempt). Predictors included cigarettes per day, time to first cigarette, motivation to quit, quitting self-efficacy, anticipated urges to smoke if quit, positive affect, negative affect, and time spent around others who smoke.

Results: In multivariable models, greater baseline time to first cigarette (OR=1.60), increases in time to first cigarette (OR=1.27) and increases in quitting self-efficacy (OR=1.14) over time predicted initiating a quit attempt above and beyond other variables. Increased motivation to quit predicted conversion of a quit attempt into quitting success (OR=1.36).

Conclusions: Predictors of making a quit attempt differed from predictors of quitting success. Predictors of quit attempts and quitting success could each serve as important treatment targets of motivation-phase interventions.

RESPIRATORY SYMPTOMS ASSOCIATED WITH E-CIGARETTES, CIGARETTES, MARIJUANA AND ELECTRONIC NICOTINE DELIVERY SYSTEMS IN A NATIONAL SAMPLE OF U.S. ADOLESCENTS

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Adolescent
Abstract Category: Original Research
Aim: We examined respiratory symptoms among 12 to 17-year-olds and associated use of e-cigarettes, cigarettes, marijuana, and marijuana in an electronic nicotine delivery system (ENDS).
Methods: We used four waves of the Population Assessment of Tobacco and Health (PATH) Study[1] data provided by a panel of 12 to 14-year-olds at Wave 1 (n=5299). We examined recent use (i.e., past 30-day) of e-cigarettes, cigarettes, marijuana, and whether marijuana was used in an ENDS (lifetime). Past-year respiratory symptoms (at Waves 2-4) were examined with five questions (e.g., chest wheezing at night). Multiple logistic regression assessed the associations among recent e-cigarette, cigarette, and marijuana use with respiratory symptoms. Generalized estimating equations (GEE) with an autoregressive correlation structure were used to account for the longitudinal design of the PATH Study.
Results: Respondents indicated recent use of e-cigarettes (9.8%), cigarettes (7.3%), and marijuana (12.5%). Eighteen percent (18.1%) indicated lifetime use of marijuana in an ENDS. The most frequent respiratory symptom was having a nighttime dry cough (37.6%). We controlled for socio-demographics, asthma diagnosis, and recent e-cigarette, cigarette, and marijuana use. The GEE analysis found that respondents who used marijuana in an ENDS had increased odds of each of the five respiratory symptoms compared to those not using marijuana in an ENDS. The odds of adolescents indicating "wheezing or whistling" in their chest was 33% higher among those who had used marijuana in an ENDS (AOR = 1.33, 95% CI = 1.12, 1.57) compared to peers who had not used marijuana in this manner. Notably, both recent use of e-cigarettes and cigarettes had no association with the respiratory symptoms in the fully adjusted models.
Conclusions: Using marijuana with ENDS may increase risk of respiratory symptoms compared to other forms of nicotine and marijuana use. Implications for prevention will be discussed.

PHENOTYPE OF RECOVERY: HEIGHTENED HEDONIC HUNGER IN EARLY SUBSTANCE USE RECOVERY MAY LEAD TO OVERWEIGHT OR OBESE OUTCOMES

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Abstract Detail: Human
Drug Category: Other, Substance Use Disorder, various
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Previous research has reported that individuals in addiction recovery are susceptible to weight gain, and may have dysregulated eating attitudes and behaviors (Jackson & Grilo, 2002). The current study aimed to explore the relationships among length of recovery, weight status, and attitudes toward food. We hypothesized that individuals in early recovery would have heightened hedonic hunger or preoccupation with palatable foods, which may contribute to later weight gain.

Methods: Participants (N=229) were registrants of the International Quit and Recovery Registry (quitandrecovery.org) who are in recovery from substance use. Participants completed a questionnaire that asked about relapse and length of recovery, anthropomorphic measures, and the Power of Food Scale (PFS), a validated measure on which higher scores reflect greater appetite for palatable foods. Participants were categorized as healthy/underweight, overweight, or obese based on their body mass index (BMI), and categorized as being in early (≤5 years) or long-term (>5 years) recovery based on the date of their last substance use.

Results: A two-way ANOVA showed that there were significant main effects of BMI group (p=0.004) with the obese group scoring higher on PFS, and length of recovery (p=0.015) with the early recovery group scoring higher on PFS. There was no significant interaction between BMI group and length of recovery [$F_{(2, 223)}=0.291$, p=0.748]. A chi-squared test of independence showed that there are greater proportions of overweight and obese individuals in the long-term recovery group [$X^2(2)=12.178$, p=0.002].

Conclusions: Our data suggest that heightened motivational states for natural reinforcers (i.e., food) during early recovery may result in excess weight gain and progression into overweight or obese states during later recovery, when hedonic hunger deceases. Considering excess weight is associated with a variety of negative health outcomes, nutritional interventions in early recovery may be key to help individuals maintain a healthy weight and prevent weight gain-related health issues.

PHARMACOKINETICS OF JUUL COMPARED TO FIVE ELECTRONIC NICOTINE DELIVERY SYSTEMS, A HEATED TOBACCO PRODUCT, AND A CONVENTIONAL CIGARETTE

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Neurobiology
Abstract Category: Original Research

Aim: To characterize nicotine pharmacokinetic (PK) profiles of the JUUL system at 5% nicotine strength, five electronic nicotine delivery system (ENDS) products (MarkTen, MyBlu 2.4%, NJOY 6%, PHIX 5%, and VUSE Solo), a heated tobacco product (iQOS), and a conventional cigarette (Marlboro Red) across controlled and ad libitum puffing conditions.

Methods: Inpatient, randomized, crossover study of adult current cigarette smokers with frequent blood sampling to capture the time course of nicotine plasma concentration, maximum plasma levels (Cmax), total nicotine exposure by area under the curve (AUC), and time to maximum level (Tmax). A product rating scale was included to capture general subjective effects.

Results: Twenty-four adult subjects completed all conditions. The cigarette produced the highest Cmax, rate of rise of plasma nicotine, AUC, and general satisfaction. JUUL's Cmax,

rate of rise of nicotine, and AUC were lower than that of cigarettes, and were comparable to that of iQOS, NJOY, and PHIX, with (alphabetically) MarkTen, MyBlu, and VUSE Solo having the lowest Cmax values. Although there were some differences in Tmax between products, the differences were small, and, as noted, cigarettes reached a higher Cmax during that time (i.e., the Tmax). Overall, subjective effects (modified Product Evaluation Scale) were generally similar in the controlled and ad libitum puffing conditions. Cigarettes scored higher in subjective effects than the other products in nearly every category.

Conclusions: The parameters that relate to abuse liability, including speed of nicotine delivery and absorption, peak nicotine levels, satisfaction, and other measures, characterize JUUL as lower than a conventional cigarette and comparable to several of the other products tested. These findings suggest that JUUL can present a sufficient and satisfactory substitute to convert adult smokers from conventional cigarettes.

PARENTAL MONITORING AND PEER INFLUENCES MEDIATE INTENTIONS FOR FUTURE ELECTRONIC NICOTINE DELIVERY SYSTEM (ENDS) USE AMONG ADOLESCENTS WITH ADHD SYMPTOMATOLOGY

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Adolescent
Abstract Category: Original Research

Aim: Attention deficit hyperactivity disorder (ADHD) symptomatology in adolescents is linked with greater nicotine use (Symmes et al., 2015). Both parents and peers are known to influence adolescents' future substance use intentions (Branstetter et al., 2011). Here, we aimed to clarify the influence of ADHD symptomatology, parental monitoring, and peer influence on electronic nicotine delivery systems (ENDS) use intentions.

Methods: We assessed psychosocial variables mediating the relationship between ADHD symptomatology and future ENDS use intentions at wave 1 of a longitudinal study among 237 high-school students (14-17 years old, M=14.95±0.67, Hispanic/Latinx: 84.7%). Participants completed the Youth Self-Report to quantify ADHD symptomatology, the Population Assessment of Tobacco and Health (PATH) to assess use intentions, as well as the Parental Monitoring Scale, the Resistance to Peer Influence Scale, and the E-cigarette Attitudes Survey. We estimated a serial multiple mediator model to characterize direct and indirect effects of ADHD symptomatology on ENDS use (in one year) through a path involving elevated poor parental monitoring, leading to reduced resistance to peer influence, and then more favorable ENDS attitudes. Bootstrapping procedures were used to estimate the statistical significance of indirect effects.

Results: We observed a positive association between ADHD symptomatology and poor parental monitoring (β=0.54, p<0.001), a negative association between poor parental monitoring and resistance to peer influence (β=-0.02, p=0.001), a negative association between resistance to peers and ENDS attitudes (β=-0.25, p=0.002), and ultimately a positive association between ENDS attitudes and ENDS use intentions (β=0.45, p<0.001). The indirect effect was significant (β=0.04, 95%CI=[0.018, 0.062]), whereas the direct effect was not (β=0.03, p=0.1).

Conclusions: The association between ADHD symptomatology and ENDS use intentions was fully mediated by poor parental monitoring, which impacted resistance to peer influence which, in turn, impacted ENDS attitudes. These outcomes suggest that strengthening the child-parent relationship may be a viable intervention target.

INTERACTIVE EFFECTS OF SEX AND BEHAVIORAL ACTIVATION ON DEPRESSIVE SYMPTOMATOLOGY AMONG TREATMENT-SEEKING SMOKERS

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Sex Differences
Abstract Category: Original Research

Aim: Behavioral Activation (BA) has taken on interest when combined with tobacco interventions. Although co-occurrence between depression and smoking is more common among women, sparse data exists regarding the interplay between sex, depression and BA. The aims of this study are to assess the main and interactive effects of sex and treatment condition on end-of-treatment BA scores among smokers with depressive symptoms, and to examine whether BA mediates the association between any potential main or interactive effect and depression. We hypothesized sex differences on the mediational effect of BA.
Methods: 120 smokers received an 8-week Cognitive Behavioral Treatment (CBT) or CBT + BA. Participants completed the Beck Depression Inventory-II (BDI-II) and the Behavioral Activation for Depression scale-short-form (BADS-SF). A two-way ANOVA assessed the main and interactive effects of sex (women vs. men) and treatment condition on participants' BADS-SF. Mediation analyses tested whether BADS-SF score mediated the association between any significant effect found in the two-way ANOVA and BDI-II score.
Results: There was a significant sex x treatment interaction effect on BADS-SF ($p = .042$). Among males, BADS-SF were higher for participants who received CBT + BA compared with those in CBT ($p = .023$). Being a male receiving CBT (relative to males in the CBT+ BA condition) was indirectly associated with higher BDI-II score through lower BADS-SF (point estimate = 3.438; SE = 1.629; BC 95% CI [0.557, 6.919]). These effects were not evidenced for women.
Conclusions: The efficacy of BA to reduce depressive symptoms is higher in men than in women. There is a need for tailoring interventions by sex when treating smokers with depression. Assessing symptoms such as mental rumination or self-consciousness, which are more pronounced in women, would improve treatments for depression among smokers.

DESIGN AND PRELIMINARY TEST OF A PERSONALIZED GENETIC RISK TOOL TO PROMOTE SMOKING CESSATION

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Behavior
Abstract Category: Original Research
Aim: Genetic variation in nicotinic receptor subunits explains differences in smoking behaviors and risk of smoking-related diseases. Returning genetic susceptibility results may motivate smoking cessation, personalize treatment, and reduce disease risk. However, as genomic discovery progresses, research is also needed to optimize the design and communication of genetics-informed interventions. This study aimed to engage potential end-users in co-designing a personalized genetics-informed smoking risk tool and test its feasibility and potential to change smoking behaviors.
Methods: We developed an algorithm that integrates genetic (CHRNA5 variants) and phenotypic (cigarettes per day) factors to estimate one's risk of lung cancer, COPD, and difficulty quitting smoking. To communicate this risk, we designed a personalized intervention, the "genetics and smoking risk profile". In two prototype studies, we conducted brief participatory design interviews (n=110) followed by quantitative surveys (n=100) with potential end-users to confirm acceptability of iterative design changes. In current smokers from the community (n=111), we conducted genetic testing, returned the personalized genetics-informed risk profiles, and assessed feasibility and efficacy of the risk profile to change smoking behavior.
Results: Current smokers agreed it was important to learn their smoking-related genetic risk (90%) and planned to share their risk profile with others (80%). Although data collection is ongoing following return of results, current smokers demonstrated comprehension of the genetic risk tool (83%) and expected that the tool will help them quit or reduce smoking (94%) and use an FDA-approved medication to quit smoking (81%).
Conclusions: As we develop the science of genetic biomarkers for smoking, we must also develop the tools to communicate the application of this science to individuals who stand to benefit from this information. Participatory design with current smokers yielded a highly acceptable personalized genetics-informed risk profile that demonstrated promise for supporting smoking cessation.

ONLINE INHIBITORY CONTROL TRAINING FOR SMOKING CESSATION: A RANDOMISED CONTROLLED TRIAL

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Treatment
Abstract Category: Original Research
Aim: Inhibitory control training (ICT) has been found to assist with weight loss. This pre-registered (ACTRN12617000252314), double-blind randomised control trial was the first to examine whether online ICT may assist with smoking cessation in a sample of nicotine-dependent smokers. We hypothesised that smokers who received ICT would show reductions in outcomes (smoking, craving, nicotine-dependence, evaluation of smoking stimuli and response inhibition) compared to the control group. We also hypothesised that a devaluation

of smoking stimuli and/or an improvement in response inhibition (measured by the stop signal task (SST)) would moderate the relationship between ICT and smoking.

Methods: Nicotine-dependent adults (n = 107) who smoked at least 10 cigarettes per day were randomised to receive either a smoking-specific go/no-go ICT intervention (cigarette images paired with no-go signals) or control go/no-go training task (neutral images 50% paired with no-go signals). Participants completed one training session per day for 14 days and were followed up to 3-months post-training. Analyses were mixed effects multiple regression models on multiply imputed data.

Results: There was no intervention effect across any of the outcome variables. Both groups showed reduced cigarette consumption (dz= -1.00 to -.58), craving (dz = -.47 to -.35) self-reported nicotine dependence (dz = -.91 to -.48) and evaluation of smoking stimuli (dz = -.60 to -.33) at all follow-ups compared to baseline. In addition, changes in evaluation of smoking stimuli predicted smoking ($F_{(3,1510.6)}$= 4.46, p= .004) and craving ($F_{(3,1046.3)}$= 5.56, p= .001) independent of condition at all follow-ups. No change in response inhibition was found.

Conclusions: ICT was not more effective than a control go/go-no task in reducing smoking and other outcome variables. A return to basic experimental research may be necessary in order to gain a greater understanding of whether ICT may assist smoking cessation. Importantly, factors such as age and nicotine satiation should be considered.

ASSOCIATION BETWEEN MARIJUANA USE AND COGNITIVE FUNCTIONING AMONG PEOPLE LIVING WITH HIV IN FLORIDA

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: HIV/Immune
Abstract Category: Original Research
Aim: Little is known about the impact of chronic marijuana use on people aging with HIV, who may also be experiencing cognitive decline due to HIV. The present study examines the association between marijuana use and cognitive functioning among people living with HIV in Florida.

Methods: The Marijuana Associated Planning and Long-term Effect (MAPLE) study is an ongoing prospective cohort study of people living with HIV that as of October, 2019, had enrolled both marijuana users (n=159) and non-users (n=40). An interviewer-administered survey assessed demographics (age, gender, race/ethnicity), frequency and duration of marijuana use, and 5 cognitive functioning domains assessed by the NIH cognitive toolbox. Main outcomes are executive function, processing speed, episodic memory, and attention.

Results: The sample is mostly male (n=107; 54%), heterosexual (n=132; 66%), non-Hispanic Black (n=140; 70%), and the mean age was 49.1 years. Mean duration of marijuana use was 32.0 years; and mean number of days of marijuana use per week was 5.4. In crude regression models, duration of marijuana use was significantly related to worse processing speed (beta = -.49, p <.001), executive function (beta -.38, p<.001), and episodic memory (beta = -.15, p<.001). Frequency of marijuana use was significantly related to improved processing speed (beta = .18, p<.020) and episodic memory (beta=.19, p<.015). In hierarchical linear regression

models that adjusted for demographic variables, the only statistically significant relationship was longer duration of use and worse processing speed (beta = -.18, p =.033). Frequency of marijuana use was no longer significant in any of the adjusted models.

Conclusions: Duration and frequency of marijuana use was not associated with cognitive functioning except for processing speed. Future studies should examine factors that may help chronic marijuana users living with HIV maintain cognitive health, especially regarding processing speed.

INTERDEPENDENT EFFECTS OF WORRY/FEAR AND OBSESSIVE-COMPULSIVE SYMPTOMATOLOGY ON ADOLESCENT ELECTRONIC NICOTINE DELIVERY SYSTEM USE INTENTIONS

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Adolescent
Abstract Category: Original Research

Aim: Individuals diagnosed with neuropsychiatric disorders are prone to nicotine use, with 50-80% being smokers. However, obsessive-compulsive disorder (OCD) is an exception with only 14% of adult patients being smokers (Bejerot & Humble, 1999), and little research focusing on adolescents. Since clinically relevant levels of obsessive-compulsive symptomatology are linked with reduced nicotine use among adults, a reasonable hypothesis is that subclinical levels may represent a protective factor for adolescent electronic nicotine delivery system (ENDS) use. As non-smoking individuals diagnosed with OCD report higher levels of worry than their smoking counterparts (Bejerot et al., 2000), we investigated whether self-reported high levels of worry/fear moderate a link between obsessive-compulsive characteristics and reduced future ENDS use intentions.

Methods: We assessed self-report measures at wave 1 of a longitudinal study among 248 high-school students (14-17 years old, M=14.95±0.67, Hispanic/Latinx: 84.7%). Participants completed Achenbach's Youth Self Report to assess obsessive-compulsive characteristics, the Early Adolescent Temperament Questionnaire Fear Subscale to assess levels of fear/worry, and items from the Population Assessment of Tobacco and Health survey to gauge beliefs surrounding ENDS use intentions (within five years). A moderation model was assessed, controlling for race, age, ethnicity, biological sex, and socioeconomic status.

Results: When considering ENDS use intentions, a significant two-way interaction was observed between self-reported worry/fear and obsessive-compulsive symptoms (estimate=0.0388, p<0.05, CI95% [0.0010, 0.0767]). The simple slope of obsessive-compulsive symptoms was statistically significant at moderate and high worry/fear (t=3.59, p<0.001; t=4.55, p<0.001; respectively), but not at low worry/fear (t=1.68, p=0.09).

Conclusions: At low levels of worry/fear, obsessive-compulsive symptomatology did not impact ENDS use intentions. Contrary to our hypotheses, at moderate and high levels of worry/fear, obsessive-compulsive symptomatology was linked with elevated ENDS use intentions. These outcomes suggest that self-reported levels of worry and obsessive-compulsive symptomatology may be relevant factors to be considered when developing targeted prevention efforts.

SEX DIFFERENCES IN CIGARETTE-SMOKING SUBJECTIVE EFFECTS FOLLOWING NICOTINE VS. PLACEBO PATCH

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Sex Differences
Abstract Category: Original Research
Aim: Aim: Sex differences exist in the subjective effects of tobacco smoking. A key difference is that men experience greater reward from nicotine and are more sensitive to nicotine levels in cigarettes than women. This sex difference contributes to lower treatment efficacy for women, especially for nicotine replacement therapies, i.e. nicotine patch. The goal of this study was to investigate subjective effects of smoking a cigarette following nicotine and placebo patch treatment in male and female smokers.
Methods: Methods: Thirty-one tobacco smokers (16 female) received a nicotine patch for 1-week and a placebo patch for 1-week in a randomized, counter-balanced order. Male and female smokers were matched on cigarettes smoked per day, years smoked and nicotine dependence levels. Following 1-week on each patch and overnight abstinence, participants were asked to evaluate their last cigarette on smoking satisfaction, psychological reward, aversion, respiratory tract sensation enjoyment, and craving reduction. Participants then smoked a cigarette and reported levels of craving and enjoyment of the cigarette (0-100 scale) several time-points relative to cigarette smoking in the context of a neuroimaging study. We compared mean subjective scores under both patch conditions using paired t-tests stratified by sex.
Results: Results: Preliminary analyses showed that men report being more psychologically rewarded by a cigarette following 1-week nicotine vs. placebo patches (p=0.23), whereas women did not differ (p=0.67). Men and women reported similar scores craving on nicotine and placebo (p>0.90) patches. Men report higher scores of enjoyment 50-min post-cigarette smoking on placebo patch compared to nicotine patch (p=0.02), whereas women did not differ (p=0.13) between conditions.
Conclusions: Conclusion: These findings suggest that men are more sensitive to nicotine levels in a nicotine patch and experience prolonged enjoyment of cigarette smoking following abstinence. We are currently examining imaging-based biomarkers of the subjective effects of smoking under the two patch conditions.

TV SERIES: NETFLIX DEPICTS MORE TOBACCO USE THAN BROADCAST/CABLE TELEVISION

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Policy
Abstract Category: Original Research

Aim: Entertainment media is effective in promoting smoking. Evidence for cinema effect on smoking initiation is substantial, with a dose-response relationship. However, much less is known about television series, which has become increasingly popular in the past years. We aimed to compare number of cigarette depictions in Netflix, the most popular streaming platform, and broadcast/cable television.

Methods: Netflix (n=6: Master of None; Love; Dear White People; Samurai Gourmet; Lovesick; Midnight Diner: Tokyo Stories) and Broadcast (n=6: Chicago Med; Chicago Fire; The Big Bang Theory; Scorpion; NCIS LA; Supergirl) series seasons were randomly selected (2016-2017). The episodes (n=202) were independently evaluated by two judges. A tobacco incident was defined by someone smoking or willing to. We did a descriptive analysis of incidents per type of TV media (Broadcast versus Netflix), series and episode. Then, Poisson regression models were used to compare tobacco incident count by type of TV media, adjusted for episode length, incidence in the first two episodes, and series gender.

Results: We found 303 tobacco incidents. Love (n=106) and NCIS LA (n=52) were the series with the higher number of tobacco incidents in Netflix and Broadcast, respectively. All Netflix series depicted tobacco incidents (n=235), contrasting with 66% found in Broadcast (n=68). Length of episodes was significantly shorter for Netflix in comparison to Broadcast (mean=26.4 minutes, 95%CI=24.8-27.9 versus mean=38.2, 95%CI=36.6-39.7, respectively, p<0.0001). In the multivariate Poisson regression model, Netflix has been associated with higher number of tobacco incidents, compared to Broadcast (coef=5.84; 95%=4.39-7.29; p<0.001). Episode length (coef=0.03; 95%CI=0.01-0.05; p<0.01), drama gender (coef=1.43; 95%CI=1.00-1.87; p<0.001) and police gender (coef=3.27; 95%CI=1.85-4.69; p<0.001) has also been associated with higher number of tobacco incidents in such model.

Conclusions: Netflix series have significantly more tobacco depictions than broadcast television. Specific policies for streaming platforms need to be implemented.

A META-ANALYSIS AND META-REGRESSION OF THE GENDER EFFECT ON VERY UNSUCCESSFUL ATTEMPTS TO QUIT: DATA FROM THE GLOBAL ADULT TOBACCO SURVEY

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Epidemiology
Abstract Category: Original Research

Aim: A significant portion of smokers fail to maintain abstinence for more than 24 hours, resulting in a Very Unsuccessful Attempt to Quit (VUAQ). Women are less successful in trying to quit smoking than men, particularly in the late abstinence period. There is uncertainty on such gender differences in the early abstinence period, which is the most probable period for relapse. We aimed to evaluate gender effects on VUAQ in a cross-national sample of low- and middle-income countries (LMICs)

Methods: Data comes from the Global Adult Tobacco Survey (2008-2012,n=230,411), including national representative samples of the 12 LMICs where almost 2/3 of the world's smokers live: Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Russia, Thailand, Turkey, Ukraine, and Vietnam. This study was restricted to those who tried to quit in the last year (n=16,576). We first ran logistic regression models for gender effects on VUAQ adjusted

for age, education, smoking onset, Heaviness of Smoking Index, smoking cessation counseling, brief advice, television smoking health in each country. Then, a meta-analysis of coefficients was carried out, adjusted for country anti-tobacco policy level through meta-regression.

Results: VUAQ varied among countries (Egypt-2.7%; China-3.2%; Thailand-3.7%; Indonesia-4.0%; Mexico-5.1%; Ukraine-5.2%; Vietnam-5.3%; India-6.8%; Bangladesh-7.2%; Russia-8.1%; Turkey-10.6%; Brazil-13.6%). Female gender was significantly associated with VUAQ in Bangladesh (aOR=27.54;95%CI=5.28-143.67), Brazil (aOR=1.23;1.03-1.46), India (aOR=3.26;1.20-8.88), Indonesia (aOR=6.32;95%CI=1.01-39.63), Mexico (aOR=2.89;95%CI=1.36-6.16), and Russia (aOR=3.14;95%CI=1.66-5.94). There was no gender effect on VUAQ in the other countries. The meta-analysis showed a female gender effect on VUAQ (OR=1.44;95%CI=1.24-1.68). This result remained significant after meta-regressions for (general and female) daily smoking, health warnings, WHO national ratings for MPOWER (Monitoring, Protecting, treatment Offering, Warning, banning Enforcement, and Raising taxes), second-hand smoking, and amount of cigarette consumed.

Conclusions: There is cross-national evidence showing that the very early abstinence period (first 24 hours) is also more challenging for women to quit smoking.

PULMONARY DISEASE AMONG E-CIGARETTE, CIGARETTE, AND MARIJUANA USERS: AN ANALYSIS OF THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEYS, 2015-2016

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research
Aim: To determine the prevalence of lifetime asthma, chronic bronchitis, chronic obstructive pulmonary disease (COPD), and emphysema among independent, dual, and combined users of cigarettes, e-cigarettes, and marijuana.

Methods: Data was analyzed from 18-to-59-year-old adults who completed the 2015-2016 National Health and Nutrition Examination Surveys (N=3,079 (weighted N=131,233,512). Computer-Assisted Personal Interview (CAPI) software was used to collect lifetime, past, and current (> 1 in past 30-days) use of cigarettes, e-cigarettes, and marijuana. Users were categorized based on current use: Independent (one substance), Dual (two substances), and Combination (all three). Independent users included: cigarette-only, e-cigarette-only, and marijuana-only users. Dual users included: cigarette + e-cigarette, cigarette + marijuana, e-cigarette + marijuana. CAPI was also used to collect lifetime asthma, chronic bronchitis, COPD, and emphysema diagnosis (pulmonary disease). Prevalence was calculated and compared using chi-square tests. Logistic regression, adjusted for age, gender, race/ethnicity, examined the association between user category and pulmonary disease.

Results: Among participants (48.5% male, 38.3 years, 58.9% Non-Hispanic White), 11.5% were cigarette-only, 9.3% marijuana-only, 2.0% e-cigarette-only, and 1.4% were combination users of all three. The top three groups with the highest prevalence of pulmonary disease included the current use of e-cigarettes: 36.4% of e-cigarette and marijuana dual users, 35.9% of independent e-cigarette users and 35.5% of combined users of cigarette, e-cigarette, and marijuana (p<0.0001). Comparatively, 23.2% of marijuana-only and 24.8% of cigarette-only

users had pulmonary disease. Combination users had the highest prevalence of lifetime asthma (32.5%), chronic bronchitis (13.5%), and COPD (14.3%) compared to other user groups (p<0.0001). Combination users had 3.68 higher odds of pulmonary disease than never users (95% CI: 1.49 – 9.12), after demographic adjustments.

Conclusions: Groups including e-cigarette users had a higher prevalence of pulmonary disease than other groups. Amid the lung-injury-related outbreaks linked to e-cigarette use, it is important to document use patterns and prevalence of pulmonary disease

IMPULSIVITY IS ASSOCIATED WITH GREATER E-CIGARETTE USE IN YOUTH

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Adolescent
Abstract Category: Original Research

Aim: Higher impulsivity in youth has been associated with earlier initiation and greater likelihood of use of e-cigarettes. Given this relationship, we hypothesize that among youth who have tried e-cigarettes, higher impulsivity would be associated with both more e-cigarette products and flavors tried and heavier e-cigarette use.

Methods: Cross-sectional survey data was collected from 6 Connecticut high schools in Spring 2019 (n = 4875). Analyses were restricted to students who reported ever having tried an e-cigarette (n = 2313). Impulsivity was assessed using the abbreviated Barrett Impulsivity Scale (BIS); an 8 item self-report measure comprised of two subscales: behavioral impulsivity and impairment of self-control. Separate linear regressions were used to model the associations between impulsivity (as measured by the BIS) and (1) total number of e-cigarette products (i.e. e-cigarette device types) ever tried, (2) number of flavors tried, and (3) frequency of vaping in the past month. All models included sex, age, race, and school as covariates.

Results: Among students who had ever tried e-cigarettes, both greater behavioral impulsivity and greater impairment of self-control were associated with more e-cigarette products ever tried (β: 0.08, $p < .001$; β: 0.11, $p < .001$), more flavors ever tried (β: 0.07, $p < .001$; β: 0.08, $p < .001$), and greater past month frequency of use of e-cigarettes (β: 0.09, $p < .001$; β: 0.05, $p = .03$).

Conclusions: Among youth who report having ever tried e-cigarettes, higher levels of impulsivity are associated with trying a greater number of e-cigarette products and flavors, and more frequent e-cigarette use in the past month suggesting that more impulsive youth are at greater risk for heavier e-cigarette use. Interventions tailored towards impulsive youth may reduce e-cigarette use in this population.

A COMPARISON OF TOBACCO USE BEHAVIORS BETWEEN BLUNT/SPLIFF USERS VS NONUSERS AMONG CIGARETTE SMOKERS IN SUBSTANCE USE DISORDERS TREATMENT

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Treatment
Abstract Category: Original Research

Aim: Cannabis and tobacco co-use is increasingly common. Co-use is associated with higher rates of dependence, more difficulty quitting and increased relapse rates for both substances. Co-use among smokers in substance use disorders (SUD) treatment, a population with epidemic rates of smoking, may hinder the effectiveness of smoking cessation interventions. We examined rates of lifetime cannabis and tobacco co-use and co-administration (blunt/spliff use) among smokers in the California SUD treatment system

Methods: We surveyed 553 clients in 18 California residential SUD treatment programs in 2019. Among current smokers (n = 322), we surveyed lifetime cannabis use (n = 311) and blunt/spliff use. We then compared demographic and tobacco use characteristics among lifetime blunt / spliff lifetime users (n = 192) versus never users (n = 130).

Results: Smokers' lifetime rate of cannabis use was 96.6% and lifetime blunt/spliff use was 59.6%. Compared to nonusers, lifetime users of blunts/spliffs had a lower mean age (34.1 v. 43.7, p < .0001), and a different racial/ethnic pattern, being more likely to report white race/ethnicity (44.3% v. 31.5%, p = .010). Blunt/spliff users were more likely to use opiates or amphetamines as a primary drug, more likely to report using THC in e-cigarettes (34.6% v. 5.5%, p < .0001) and to use other tobacco products in addition to cigarettes (e-cigarettes, cigars, cigarillos, and smokeless tobacco). Blunt/spliff users were less likely to think of quitting smoking within the next 30 days (27.1% v. 39.2%, p = .022), but more often wanted help with quitting (41.7% v. 30.2%, p = .038)

Conclusions: Smokers in SUD treatment with a history of blunt/spliff use report wide use of tobacco products. They want help quitting smoking but may feel less prepared to quit. High lifetime use of cannabis and of e-cigarettes for THC delivery may warrant clinical considerations

AN INITIAL EXAMINATION OF MOMENTARY INFLUENCES ON SELF-REGULATION AMONG CIGARETTE SMOKERS: AN ECOLOGICAL MOMENTARY ASSESSMENT STUDY USING MOBILE DEVICES

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Technology Issues
Abstract Category: Original Research

Aim: Self-regulation problems are implicated as a deficit underlying cigarette smoking. However, little is known about how various dimensions of self-regulation vary across changing momentary contexts among cigarette smokers. The current investigation aimed to evaluate

relations between momentary self-regulation and contextual variables, such as internal states and smoking-specific risk factors.

Methods: In this study, we recruited cigarette smokers (n=82; 72% female; M=18.5 cigarettes/day) for a two-week ecological momentary assessment (EMA) study to evaluate relations between momentary context and momentary self-regulation, using a measure with four momentary subscales: perseverance, sensation-seeking, self-judgment, and mindfulness. Associations between the momentary subscales and momentary contextual variables were evaluated using mixed effects models with a time variable for change across the study period and an individual-level intercept for non-independence of repeated observations.

Results: Models revealed several associations between the four momentary self-regulation subscales and momentary environmental contexts, internal states, and smoking risk factors. Being at work was associated with higher perseverance and lower mindfulness, whereas having smelled cigarette smoke or consumed alcohol were related to higher sensation seeking and self-judgment (all p≤.02). Challenging internal states, including elevated stress and negative affect, were associated with worse momentary self-regulation (lower perseverance, lower mindfulness, and higher self-judgment; all p<.01). Smoking risk factors, such as momentary temptation and urge to smoke, were associated with worse momentary self-regulation (lower perseverance and mindfulness, higher self-judgment; all p≤.02).

Conclusions: Momentary self-regulation was associated with momentary contextual variables, internal states, and smoking-specific risk factors among a sample of cigarette smokers. Future research is planned to evaluate how momentary self-regulation is impacted during a mobile intervention that targets cigarette smokers' self-regulation.

MENTHOL CIGARETTE SMOKING IN SUBSTANCE USE DISORDER TREATMENT BEFORE AND AFTER A FLAVORED TOBACCO BAN

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Policy
Abstract Category: Original Research

Aim: To combat the high rates of menthol smoking among vulnerable populations, San Francisco implemented a ban on the sale of flavored tobacco products, including menthol cigarettes, in January 2019. Persons in substance use disorder (SUD) treatment smoke menthol at higher rates than the general population. Menthol smoking has been associated with greater cigarette dependence and difficulty quitting, but no research has examined the effect of such a ban on persons in SUD treatment. We examined the prevalence of menthol cigarette smoking among people in SUD treatment before and after implementation of the menthol ban, and how the ban affected access to menthol cigarettes.

Methods: Cross-sectional surveys were conducted at two residential SUD programs in San Francisco eight months before (n=160) and eleven months after (n=119) the ban took effect. Information on awareness of the ban and access to menthol cigarettes was collected after the ban. Chi-squared and Fischer's exact tests were used for comparisons.

Results: Smoking prevalence was 71.3% before the ban and 74.0% after (p = 0.82). Prior to the ban, 48.3% of smokers reported usually smoking menthol compared to 42.7% after (p = 0.52). 50.9% of menthol smokers reported smoking only menthol cigarettes before the ban

compared to 20.1% after (p < 0.01). Most (80.5%) participants were aware of the menthol ban, however 48.3% reported seeing menthol cigarettes for sale in the past month. Among menthol smokers, 58.5% reported accessing menthol cigarettes from a San Francisco store in the past month.

Conclusions: Nearly a year after San Francisco's ban on the sale of menthol cigarettes took effect, we observed little change in smoking prevalence and rates of menthol smoking among people in SUD treatment. The decreased prevalence of smoking only menthol cigarettes, suggests that, though still available, menthol cigarettes may have been more difficult to obtain

Pain

TOBACCO IN RELATION TO OPIOID MISUSE AMONG ADULTS WITH CHRONIC PAIN: THE MODERATING ROLE OF PAIN-RELATED ANXIETY

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Chronic pain is a public health problem that serves as a potent motivator for substance use, including opioids and tobacco. Research has shown that, relative to non-smokers, smokers with chronic pain evince higher rates of opioid-related problems. Yet, these observed relations may not be equally distributed in society, and there may be merit in understanding affect-based vulnerabilities that may confer heightened risk for opioid-related problems among smokers with chronic pain. Pain-related anxiety, or anxiety about pain-related physical sensations, has independently shown robust relations to tobacco and opioid use, yet no work has examined how pain-related anxiety may be related to opioid misuse among smokers with chronic pain. Therefore, the present investigation examined the moderating effect of pain-related anxiety in the relations between tobacco use problems and opioid misuse, dependence, and number of opioids.

Methods: Participants were 432 adults (74.1% female, Mage=38.36, SD=11.13) reporting current chronic pain and opioid use. Measures included the Alcohol, Smoking, and Substance Involvement Screening Test, Pain Anxiety Symptoms Scale, Current Opioid Misuse Measure, Severity of Dependence Scale, and the Self-Report Opioid Analgesic Questionnaire. Moderation analyses were conducted adjusting for age, gender, education, income, and pain intensity.

Results: Among those with high pain-related anxiety, tobacco use problems were significantly associated with current opioid misuse (B=.58, p<.001), severity of opioid dependence, (B=.11, p<.001), and number of opioids (B=.13, p<.001). The relations between tobacco use problems and opioid-related outcomes were not significant for individuals with low levels of pain-related anxiety.

Conclusions: The current results suggest that among individuals with chronic pain, tobacco use problems are related to opioid misuse outcomes among individuals with high, but not low pain-related anxiety. Results provide initial empirical evidence for the effect of pain-related anxiety in the relations between tobacco use problems and clinically-significant opioid use outcomes.

THE SOCIAL COST OF PAIN: REJECTION SENSITIVITY, SOCIAL REJECTION, AND CANNABIS USE IN YOUNG ADULTS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Cannabis has been implicated in reducing or buffering the effects of social pain in young adults. The effects of social rejection and cannabis use in young adults are understudied, as well as its relationship to rejection sensitivity (RS), particularly for heavier users. We conducted a prospective study to link experimental methods to ecological momentary assessments (EMA).

Methods: Seventy undergraduates (M = 20.56, SD = 3.13; 50% female) with moderate (n = 21) and heavy (n = 25) cannabis use and non-using controls (n = 24) were recruited. Rejection sensitivity (RS) was assessed at three levels: a) trait RS, b) RS and cannabis use frequency and their influence on rejection distress (RD) to experimental social exclusion; c) the influence of lab-induced RD on real-world cannabis use, craving and rejection (using text-message based EMA completed over one-week in real-world settings). Multi-level regression models were used to prospectively predict real-world cannabis craving and use from experimentally assessed RD during social exclusion.

Results: No significant group differences on trait RS emerged. Mixed effects logistic regression results revealed that increased rejection distress (RD) to experimental social exclusion is significantly associated with reduced odds (45%) of real-world cannabis craving (but not use), p = .03. Real-world experiences of rejection were not associated with craving or use. Trait RS and cannabis use frequency had no significant interaction effect on rejection distress to social exclusion. Notably, cannabis users reported a significantly greater increase in craving cannabis to achieve relief from negative mood after laboratory induced social exclusion.

Conclusions: The results provide converging evidence that experimentally induced rejection distress influences and is prospectively predictive of reduced real-world cannabis craving. Findings have important research and clinical implications for treating cannabis use, such as evaluating the impact of RS on traditional psychotherapy treatments and text-messaging based interventions for targeted, real time substance use treatment.

GENDER DIFFERENCES IN CHRONIC PAIN AMONG AN URBAN OPIOID USE DISORDER OUTPATIENT BUPRENORPHINE TREATMENT POPULATION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other

Abstract Category: Original Research

Aim: Data on the role of pain in the clinical course of opioid use disorder (OUD) treatment is lacking. Investigating this relationship by gender is warranted. The primary objective is to describe gender differences in chronic pain among a clinical OUD population in outpatient buprenorphine treatment. Our secondary objective is to elucidate associations between pain and (1) buprenorphine non-adherence and (2) self-reported tendency for substance use.

Methods: Adult patients were recruited from an urban, outpatient, comprehensive substance use treatment clinic to complete a voluntary, electronic, cross-sectional survey between July and September 2019. Participants on buprenorphine for OUD were included (N=140). Chronic pain was assessed by self-report. The Prescription Monitoring Program was reviewed for treatment non-adherence, operationalized as >5% of days in buprenorphine receipt lapsed (within past 12 months). Pain coping was assessed by the Pain Catastrophizing Scale (PCS), and a novel visual analog scale assessed pain-associated tendency for drug and alcohol use. Multivariable logistic regression controlling for length of time on buprenorphine was conducted.

Results: To date, 60 men and 70 women have completed the survey. Mean age was 43 years, and 71% were Black. Mean length of time in buprenorphine treatment was 422.3 days (range 10-687). Chronic pain was common among both men [27 (45.0%)] and women [24 (34.3%); p=0.2] with similar pain durations, severity and interference. Treatment non-adherence did not differ by gender nor was associated with chronic pain, age, depression/anxiety in the multivariable analyses. Men and women with chronic pain did not report stronger pain associated tendencies for drug or alcohol use, but subjects with higher pain catastrophizing did (beta .501; 95% CI 0.037, 0.97).

Conclusions: Chronic pain is common among men and women with OUD. Across gender, addressing pain coping skills with targeted behavioral health approaches may improve the clinical course of patients in OUD treatment with buprenorphine.

PILOT STUDY OF MINDFULNESS-ORIENTED RECOVERY ENHANCEMENT (MORE) FOR INDIVIDUALS WITH OPIOID USE DISORDER AND CHRONIC PAIN IN METHADONE MAINTENANCE TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: Methadone maintenance therapy (MMT) is an efficacious medication for opioid use disorder (OUD), yet many individuals on MMT relapse. Chronic pain and deficits in positive affective response to natural rewards may result in dysphoria that fuels opioid craving and promotes relapse. Therefore, behavioral therapies that ameliorate chronic pain and enhance positive affect, like Mindfulness-Oriented Recovery Enhancement (MORE), may serve as useful adjuncts to MMT. The aim of this study was to conduct a pilot trial of MORE for OUD and chronic pain as an adjunct to MMT as compared to MMT as usual (TAU). We hypothesized that individuals randomized to MORE will have greater decreases in drug use, distress, and pain-related interference.

Methods: Men and women with OUD and chronic pain in MMT (N=30) were randomized to 8 weeks of MORE or TAU. Participants were assessed at baseline, 8-weeks (post-treatment), and 16-weeks.

Results: We found promising effects of MORE (compared to TAU) in models controlling for baseline values, age, gender, and time in MMT. At 8-weeks, relative to TAU, participants in MORE reported fewer days of illicit drug use (p = .047), fewer days of heroin use (p = .048), and lower odds of cocaine/crack use in the past 30 days (p = .032). Also, relative to TAU, participants in MORE evidenced lower levels of prescription opioid misuse risk (p = .011), and less pain-related functional interference (p = .006). Also, at 8-weesks, relative to TAU, participants in MORE reported less emotional distress (p = .017) and less catastrophizing (p = .005). We also observed promising effects at 16-weeks, including effects of MORE relative to TAU on days of illicit drug use (p = .04), craving (p = .018), and pain-related functional interference (p = .008).

Conclusions: MORE may be a useful non-pharmacological adjunct for individuals with OUD and chronic pain in MMT.

PERSPECTIVES ON ADDRESSING CHRONIC PAIN AND OPIOID USE DISORDER AMONG PERSONS WITH HIV: RESULTS FROM A SURVEY OF HIV PROVIDERS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: Guideline-concordant care of chronic pain and opioid use disorder (OUD) are inconsistently applied among people with HIV (PWH). We sought to characterize the knowledge and behaviors of HIV providers regarding management of chronic pain and/or OUD.

Methods: In Fall 2019, in partnership with the American Academy of HIV Medicine (AAHIVM), a national organization of clinicians and pharmacists treating patients with HIV (PWH), we surveyed their membership by email. We assessed practice setting characteristics, knowledge of and comfort with care guidelines, and comfort prescribing medications by class. We assessed knowledge of guidelines as a yes/no question and comfort using a Likert scale from 1 (not at all comfortable) to 10 (extremely comfortable). We compared knowledge of and comfort with chronic pain versus OUD guidelines/management.

Results: Among 834 individuals who opened the e-newsletter to which the survey was linked, 17% completed the survey. Among all participants (total n=139, including 44% physicians or physician-trainees and 56% advanced practice providers), 88 (63%) reported knowledge of published guidelines for chronic pain management. Regarding comfort with managing certain problems among PWH, the mean response was 6.1 (standard deviation [SD] 2.6) for chronic pain and 5.6 (SD 3.2) for OUD (p=0.03). Regarding comfort prescribing medications, the mean response was 6.5 (SD 2.6) for full-agonist opioids and 6.1 (SD 3.2) for buprenorphine (p=0.04). Among licensed prescribers (n=71), 35 (49%) had obtained a waiver to prescribe buprenorphine for OUD.

Conclusions: Targeted efforts are needed to increase HIV providers' comfort with the management of OUD and to improve implementation of the treatment of OUD in HIV care settings.

PREVALENCE AND CHARACTERISTICS OF CHRONIC PAIN AMONG OPIOID DEPENDENT PATIENTS IN NORWAY: A SURVEY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: Chronic pain in opioid dependent individuals with no primary pain diagnosis is not well understood, and may contribute to maintain the opioid dependence in a high number of these individuals. Our aim was to investigate the prevalence of chronic pain and clinical pain characteristics of an opioid dependent population in Norway with no primary pain diagnosis.

Methods: A total of 569 patients referred to treatment for opioid dependence (DSM-V) were assessed for chronic pain conditions in a multi-center cross-sectional survey. All participants filled out a brief questionnaire including location, onset and characteristics of the pain condition. NRS-11 was used to measure the pain intensity.

Results: Fifty-five per cent of the patients (n=306) reported current chronic pain having lasted for at least 3 months. The mean age was 42 years (median: 42, range: 19-65) and 32% were women. The age distribution was similar for both genders. The prevalence of chronic pain was higher among women (61%) than men (52%) (p=0.032%) and associated with higher age (p<.001). There was a higher prevalence of chronic pain among methadone patients compared to those receiving buprenorphine / buprenorphine-naloxone or not receiving any opioid agonist treatment (p<.001 both groups).

In the chronic pain group mild, moderate and severe pain intensity was reported by about one third each. The severe pain group had a higher number of pain locations, was more likely to endorse the pain descriptors "cramping" and "cruel" and was less likely to report that pain medication had an effect on their pain, compared to the mild pain group.

Conclusions: The high prevalence of chronic pain found in our survey underscores the importance of pain recognition and management in the treatment of opioid dependent patients. Chronic pain may contribute to maintain opioid dependence and interact negatively with recovery and treatment outcomes for this group of patients.

PROXIMAL ASSOCIATIONS BETWEEN PAIN, PTSD, AND PRESCRIPTION OPIOID USE: RESULTS FROM A DAILY DIARY STUDY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research

Aim: Chronic pain and posttraumatic stress disorder (PTSD) symptoms have been linked to medical and non-medical prescription opioid use (POU), as well as POU in combination with other substances. Since prior research has been primarily limited to cross-sectional designs, the present study aimed to test how day-to-day fluctuations in self-reported pain and PTSD symptoms relate to POU alone and in combination with other substances. It was hypothesized

that both higher pain ratings and more severe PTSD symptoms would independently predict same- and next-day medical POU, non-medical POU, and co-use of other substances.

Methods: Community-recruited adults (N=40; Mage=39.9; SD=11.6; 60.0% female) with clinical (n=27) or subclinical (n=13) PTSD and past 30-day POU were enrolled in a 4-week daily diary study. Participants reported their daily PTSD symptoms (PTSD Checklist for DSM-5), pain ratings (0-100), and their POU (medical and non-medical) and other substance use (e.g., alcohol, illicit substances, and non-medical use of prescription medications; Yes/No) through a smartphone app. Generalized linear mixed-models were used to test the primary hypotheses.

Results: Three-quarters (73.8%) of all possible daily assessments were completed. Higher PTSD symptoms were associated with increased odds of non-medical POU alone (OR=1.06; 95% CI [1.02,1.10]) and in combination with at least one other substance (OR=1.05; 95% CI [1.01,1.10]) on the same day, but not the next day. Pain ratings were not associated with same- or next-day non-medical POU alone or co-use of other substances. Neither pain ratings nor PTSD symptom severity were associated with same- or next-day medical POU alone or in combination with other substances.

Conclusions: Our findings suggest that the likelihood of non-medical POU alone and in combination with other substances is more strongly linked PTSD symptoms than to physical pain. Continued research is needed to understand the temporal nature of the relation between PTSD and POU.

EPISODIC FUTURE THINKING REDUCES SEVERITY OF CHRONIC PAIN

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Chronic pain is a major public health challenge in the United States and around the world. Current treatments including opioid analgesics and cognitive behavioral therapy possess harmful side effects or limited efficacy, respectively. Chronic pain is associated with a variety of unhealthy behaviors including opioid misuse. Moreover, individuals who suffer from chronic pain exhibit excessive discounting of delayed rewards, suggesting a constricted temporal window of valuation. Reductions in the excessive discounting of delayed rewards has been achieved with Episodic Future Thinking (EFT; vividly imagining realistic future events). EFT has also been associated with reductions in a variety of unhealthy behaviors. In this study, the effects of EFT on delay discounting and levels of pain were investigated in individuals reporting chronic pain.

Methods: Individuals reporting chronic pain (N = 298; 42.6% female) were recruited through the Amazon Mechanical Turk platform. Measures of delay discounting and pain were collected at baseline and again after randomization to EFT (N=152) or Control Episodic Thinking (CET) (N=146). Analysis of covariance (ANCOVA) was performed to test the effect of EFT on delay discounting and pain scores.

Results: EFT significantly reduced delay discounting relative to baseline ($p < 0.0001$) and EFT reduced pain scores in a baseline dependent manner ($p = 0.00117$) when compared to CET; that is, those with the greatest reports of pain experienced the greatest reduction.

Conclusions: These findings suggest that Episodic Future Thinking, by widening the temporal window, may reduce pain in those reporting chronic pain and therefore represents a potential opioid-sparing therapeutic.

CO-OCCURRING ALCOHOL AND OPIOID USE AMONG TRAUMA-EXPOSED ADULTS WITH CHRONIC PAIN: THE ROLE OF DISTRESS TOLERANCE

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: The opioid epidemic is a substantial public health and economic burden and has been linked to chronic pain and prescription opioid misuse. Research has demonstrated that individuals may use opioids and alcohol to self-medicate due to their chronic pain and/or trauma exposure. While rates of opioid and alcohol use remain high among those with chronic pain and trauma histories, transdiagnostic mechanisms underlying this comorbidity have yet to be fully explored. Distress tolerance, or the perceived ability to withstand negative emotional states, has demonstrated associations with opioid misuse and alcohol use among trauma-exposed individuals. However, no work has examined how distress tolerance may influence alcohol and opioid co-use among trauma-exposed individuals with chronic pain. Therefore, the present study examined the moderating effect of distress tolerance on the relationship between alcohol use severity and opioid misuse and severity of opioid dependence.
Methods: Participants included 424 trauma-exposed adults (74.1% female, Mage=38.3, SD=11.1) who endorsed current chronic pain and opioid medication use. Measures included the Alcohol, Smoking, and Substance Involvement Screening Test, Distress Tolerance Scale, Current Opioid Misuse Measure, and Severity of Dependence Scale. Moderation analyses were conducted adjusting for age, gender, pain intensity, trauma load, and non-alcohol/opioid drug use.
Results: Alcohol use severity was significantly associated with current opioid misuse (B=0.53, p<0.001) and severity of opioid dependence (B=0.08, p=0.002) for those with low levels of distress tolerance. The relationship between alcohol use severity and opioid-related outcomes were not significant for individuals with high perceived distress tolerance.
Conclusions: Results suggest that among trauma-exposed individuals with chronic pain, alcohol use severity is related to opioid misuse and opioid dependence severity among those with low perceived distress tolerance. These findings provide preliminary evidence for distress tolerance-based intervention efforts to treat this potentially lethal comorbidity.

PREVALENCE AND SEVERITY OF CHRONIC PAIN IN INDIVIDUALS AT AN OUTPATIENT SUBSTANCE USE DISORDERS RESEARCH CLINIC: A CROSS-SECTIONAL ANALYSIS.

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research
Aim: Chronic pain is highly prevalent and often found to co-occur with substance use disorders (SUDs). Our aim was to explore the prevalence and severity of chronic pain among individuals with SUDs at an outpatient research clinic.
Methods: We conducted a cross-sectional analysis of self-reported prevalence and severity of pain in all participants presenting to an outpatient research clinic seeking treatment for a SUD (opioid, cannabis, alcohol, cocaine, or nicotine). We included questions based on the Brief Pain Inventory (BPI) on pain severity, impact on enjoyment, and impact on general activity. To assess the associations between SUD and prevalence of pain or impact outcomes we used chi-squared tests. To analyze the associations between SUD and dichotomized pain or outcome scores (dichotomized at <5 and ≥5) we used logistic regression models adjusted for age, gender, race, and ethnicity.
Results: Two hundred six participants completed the questionnaire. Six participants were removed from the analysis because their pain was due to opioid withdrawal or only occurred when they did not take drugs. There was no significant association between SUD and pain or impact prevalence. There was a significant association between substance use categories and dichotomized pain scores (p=.042); specifically, those with opioid use disorder had greater odds of high subjective pain than those with alcohol use disorder (OR=5.38; p=.012) or cannabis use disorder (OR=2.83; p=.024).
Conclusions: Chronic pain was found to be prevalent across each reported SUD category in our outpatient research clinic. Individuals with opioid use disorder had greater odds of high pain scores than those with alcohol or cannabis use disorders. Efforts should be made to better understand the pain etiology in populations with SUD other than opioids.

ILLICIT OPIOID USE FOLLOWING CHANGES IN OPIOIDS PRESCRIBED FOR CHRONIC NON-MALIGNANT PAIN

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research
Aim: To evaluate the role of changing opioid pain reliever (OPR) prescribing on illicit opioid use among patients previously reliant upon OPRs.
Methods: We conducted a retrospective cohort study among 602 publicly-insured primary care patients who had been prescribed OPRs for chronic non-cancer pain for at least three consecutive months in San Francisco, including a historical reconstruction interview and medical chart abstraction focused on illicit substance use and OPR prescriptions, respectively, from 2012 through the interview date in 2017-2018. We used a nested-cohort design, in which patients were classified, based on OPR dose change, into a series of nested cohorts starting

with each follow-up quarter. Using continuation-ratio models, we estimated associations between OPR prescription discontinuation or a 30% increase or decrease in dose, relative to no change, and subsequent frequency of heroin and non-prescribed OPR use. Models controlled for demographics, clinical and behavioral characteristics, and past use of heroin or non-prescribed OPRs.

Results: A total of 56,372 and 56,484 participant-quarter observations were included from the 597 and 598 participants available for analyses of heroin and non-prescribed OPR outcomes, respectively. Participants discontinued from prescribed OPRs were more likely to use heroin (Adjusted Odds Ratio (AOR)=1.57, 95% CI: 1.25-1.97) and non-prescribed OPRs (AOR=1.75, 1.45-2.11) more frequently in subsequent quarters compared to participants with unchanged OPR prescriptions. Participants whose OPR dose increased were more likely to use heroin more frequently (AOR=1.67, 1.32-2.12). Results held in sensitivity analyses.

Conclusions: Discontinuation of prescribed OPRs was associated with more frequent non-prescribed OPR and heroin use. Increased OPR dose was also associated with more frequent heroin use. Clinicians should be aware of these risks in determining pain management approaches.

BELIEFS ABOUT YOGA AMONG PATIENTS WITH AND WITHOUT CHRONIC PAIN ENROLLED IN METHADONE MAINTENANCE

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Alternative Medicine
Abstract Category: Original Research

Aim: Investigators surveyed participants enrolled in methadone maintenance on their beliefs about and willingness to try yoga before initiating an onsite pilot yoga program.

Methods: After obtaining informed consent, a convenience sample of participants enrolled in the Opiate Treatment Outpatient Program provided information on basic demographics, treatment history, chronic pain (CP), general health, current exercise, willingness to try yoga (0-100 VAS), and then completed the Beliefs about Yoga Scale (BAYS). This 11-item Likert scale (range 11-77) assessed expected benefits, discomforts, and social norms of yoga participation with higher values representing more positive beliefs.

Results: Of the 71 participants, 38 (54%) reported CP. Participants with CP had an average age of 48 years (+/-11 SD), were predominantly minority (63%), non-Hispanic (84%) and reported an average current pain rating of 6.1 (+/-2 SD). Participants with CP were more likely female (39% vs. 18%, p=0.05), reported less weekly exercise (p=0.03) and worse global health (p=0.04) compared to participants without CP. There was no significant differences in current methadone dose (103 vs. 88 mg, p=0.14) or time in treatment between groups. The top current pain coping strategies were over the counter medications (62%), stretching (55%), meditation (47%) and prayer (42%). Fifty-eight percent of participants with CP had ever tried yoga but only 32% had attended a yoga class in the previous year. Across both groups, there were high ratings on willingness to try yoga (74 +/-29 SD) and the BAYS (58+/-10 SD) representing extremely positive yoga beliefs.

Conclusions: Consistent with prior studies in methadone maintenance, the majority of study participants reported CP. Participants with CP were less physically active and had worse ratings

of overall health compared to participants without CP. However, participants with and without CP were very willing to try and expected positive benefits from an onsite yoga program.

Stimulants

RELATIONSHIP BETWEEN DSM-5 COCAINE USE DISORDER AND QUANTITY, FREQUENCY AND DURATION OF COCAINE USE DURING THE PERIOD OF HEAVIEST USE

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Epidemiology
Abstract Category: Original Research
Aim: Cocaine use is on the rise and research is needed to identify risky patterns of use.
Methods: The National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III) is an NIAAA funded cross-sectional survey study conducted between 2012-2013. Among the 36,309 adults interviewed, 2,988 (8.2%) lifetime cocaine users were identified. Quantity, frequency, and duration of use (Q-F-D) were each stratified into four groups (low, medium, high, and very high). Logistic regression was used to examine the relationship between Q-F-D and Cocaine use disorder (CocUD) diagnosis controlling for covariates and survey design. Interactive effect of Q*F, Q*D, or F*D on CocUD was assessed.
Results: As the level of cocaine use increased from low to very high, the prevalence of CocUD increased. Compared to people with low F, cocaine users with very high F were 12.09 times (95%CI 6.33, 23.07) as likely to meet criteria for CocUD. Similar analysis for Q of use (very high Q vs. low Q) was associated with 4.84 (95%CI 2.55, 9.18) times the risk of CocUD. D was not significantly associated with the risk of CocUD. A significant additive interaction was identified between Q*F on CocUD prevalence. People with high Q & high F were 14.84 times (95%CI 9.20, 23.91) as likely to meet criteria for CocUD than people with low Q & low F. Approximately one-third of the excess risk associated with having high Q & high F was due to the interactive effect.
Conclusions: Of the three aspects of cocaine use patterns, F had the strongest association with CocUD, followed by the Q. High Q and high F was a very dangerous pattern of cocaine use as the combination had as a synergistic effect on the risk of CocUD. It is important for intervention programs to focus on reduction of both Q and F.

ACQUISITION AND PERSISTENCE OF A NEW RESPONSE FOR COCAINE-ASSOCIATED STIMULI

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Behavior
Abstract Category: Original Research

Aim: Drug-associated stimuli take on rewarding properties that promote drug-seeking and relapse. In the current study, we characterized the extent to which cocaine-associated stimuli alone facilitated the acquisition and persistence of a new response.

Methods: Male rats (n = 8/group) underwent 10 Pavlovian conditioning sessions in which they received 10 cocaine deliveries (100, 320, or 560 ug/kg/inf) and 10 stimulus presentations according to a variable time 15 min schedule. For the experimental group, rats received the cocaine deliveries and stimulus presentations together (Paired). For the control group, the cocaine deliveries and stimulus presentations occurred according to two separate clocks (Random). Next, we tested the extent to which the cocaine-associated stimulus functioned as a conditioned reinforcer across 42 days by allowing rats to freely emit nose-poke responses that resulted in the presentation of the cocaine-associated stimulus alone.

Results: We quantified the conditioned reinforcing properties of the stimulus by computing a Preference Score (Active – Inactive Responses) for each day for each rat. We found that the preference score depended on an interaction between the day of testing, conditioning history, and dose (p = 0.01, ηp2 = 0.09). We found a main effect of dose (p = 0.001, ηp2 = 0.28) and a main effect of conditioning (p = 0.002, ηp2 = 0.20), such that rats that received Paired Pavlovian conditioning at higher doses of cocaine tended to have higher preference scores. Effect size analyses were used to examine the persistence of responding and revealed that rats that received Paired Pavlovian conditioning with 320 ug/kg/inf showed large effect sizes out to 38 days, whereas animals conditioned with 100 or 560 ug/kg/inf showed large effect sizes for up to 28 or 8 days, respectively.

Conclusions: These findings demonstrate that cocaine-associated stimuli maintain prolonged drug-seeking, which underscores the importance of Pavlovian conditioning processes in drug abuse.

TAILORING EVIDENCE-BASED INTERVENTIONS TO REDUCE METHAMPHETAMINE USE AMONG PATIENTS ON METHADONE LIVING WITH HIV IN HANOI, VIETNAM

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Treatment
Abstract Category: Original Research

Aim: Methamphetamine (meth) use poses a major challenge to treatment of opioid use disorders (OUD) and HIV infection. Evidence-based interventions (EBIs) for reducing meth use are known; however, limited evidence exists to guide their optimal use in the settings of OUD and HIV. This study assesses a combination of EBIs for meth use among people living with HIV (PLWH) and OUD on methadone treatment.

Methods: PLWH in four methadone clinics were screened using the ASSIST and urine testing for meth. Those with medium- or high-risk meth use ASSIST levels and meth urine positive results were eligible for a 12-week study. All received contingency management (CM) for meth for the first 6 weeks. Those with urine tested negative consecutively for last three weeks (responders) then received daily SMS-text reminders for the second six weeks. Non-responders to CM were randomized to Matrix-based twice-a-week meetings or to Matrix+CM. Outcomes include weekly meth use results and viral load levels (undetectable vs. detectable with the cut-

off point of >=20 copies/mL) at 6- and 12-weeks. Group differences were assessed using Fisher's exact and Wilcoxon's rank sum tests.

Results: Of 236 PLWH screened, 71 (30.1%) met the study's eligibility criteria and 51 (71.8%) enrolled. Fully 49 participants completed the 12-weeks, most with moderate-risk use (n=40). Meth urine positive samples reduced from 54.9% to 12.5%. Proportion of participants with moderate-risk meth use is higher among CM responders than non-responders (93.1 vs. 61.9%, p=0.01). CM responders (n=29, 56.8%) remained urine negative throughout SMS-text reminders. For CM non-responders (n=20), no significant differences in negative urine were observed by Matrix vs Matrix+CM treatments (60% vs. 70%, p=0.64). Both CM-responders and non-responders observed non-significant increases in proportions of non-detectable viral load at the 12-weeks.

Conclusions: Findings when tailoring EBIs to the responses of PLWH with OUD who use meth provide compelling guidance for future confirmatory trials.

THE EFFECT OF A HUMANIZED ANTI-COCAINE MONOCLONAL ANTIBODY ON THE IN VITRO METABOLISM OF COCAINE

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: The humanized anti-cocaine monoclonal antibody (mAb) h2E2 is a lead candidate for treating cocaine-use disorders. When cocaine binds to h2E2, it is likely not available for hydrolysis by endogenous esterases. Therefore, the antibody is expected to prevent the clearance of cocaine. Paradoxically, the elimination half-life of cocaine is unchanged in the presence of h2E2. The FDA raised concerns that an h2E2-induced delay in metabolism may result in prolonged exposure to cocaine. For clinical development, it is important to clarify the pharmacokinetic and safety profile of h2E2. We determined the effect of h2E2 on the in vitro enzyme kinetics of liver carboxylesterase I (CES1), which hydrolyzes cocaine to benzoylecgonine (BE), and butyrylcholinesterase (BChE), which hydrolyzes cocaine to ecgonine methyl ester (EME).

Methods: Cocaine hydrochloride (20 μM) was incubated at 37°C with a range of concentrations of CES1 or BChE in the presence or absence of h2E2 (10 μM; equimolar cocaine binding sites). Aliquots were collected at designated time points over 60 minutes. Cocaine and metabolites were quantified using LC-MS/MS.

Results: In CES1 reactions, there was a time-dependent formation of BE in the absence of h2E2 (n=5). The mAb inhibited the production of BE by greater than 90% at all enzyme concentrations. Preliminary data (n=1) also suggest h2E2 prevents the hydrolysis of cocaine to EME by BChE.

Conclusions: The mAb inhibited the CES1-mediated breakdown of cocaine to BE. In vivo, this could explain the observed decrease in the plasma concentrations of BE. It is possible the h2E2-induced increase in plasma cocaine concentrations may alter the in vivo metabolism of cocaine in favor of BChE, thereby increasing the relative proportion of EME to BE. This and

the paradoxical elimination of cocaine from plasma in vivo should be resolved through a more extensive investigation of cocaine pharmacokinetics in the presence of the antibody.

A VIRTUAL SELF-ADMINISTRATION LABORATORY WITH EXPANDED CAPABILITIES

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Mechanisms of Action
Abstract Category: Original Research

Aim: A pharmacokinetic/pharmacodynamic (PK/PD) interaction model of self-administration behavior based on the concept of a satiety threshold explains why the intervals between self-injections are regular at any unit dose and increase with unit dose. Demonstrating these principles in a classroom setting are impractical because they require catheterized rats, DEA-regulated drugs and, for cocaine, intervals at higher unit doses are long. Therefore, a virtual self-administration laboratory with a virtual rat was created. The compulsion zone theory of the self-administration paradigm was included to investigate whether this would simulate the priming, loading and extinction phases of a typical cocaine self-administration session.
Methods: The simulation was created in C# using UnityEngine. The program was based around an algorithm that increases the drug concentration by a defined unit dose on an FR-1 schedule when the concentration is below satiety threshold and above the priming threshold (the compulsion zone). After termination of access to the agonist, lever pressing behavior was simulated while the drug transited the compulsion zone. Antagonist effects on the system were simulated by increasing the magnitude of the satiety threshold.
Results: This program provided an accurate simulation of the effect of unit dose on the loading phase of a session and the pattern of lever pressing during the extinction phase of a session. In addition, our generated intervals with simulated half-life values like cocaine did not significantly deviate from those observed in rats self-administering cocaine. The effects of competitive antagonists on self-administration behavior also resembled the effects observed in rats.
Conclusions: The inclusion of a compulsion zone into the program resulted in a virtual self-administration laboratory that accurately reflects cocaine self-administration behavior in rats. This program allows the investigation of the effect of pharmacokinetics on self-administration behavior and of the effects of pharmacodynamic antagonists.

THE EFFECTS OF A D-AMPHETAMINE CHALLENGE ON ACTIVE-STATE FUNCTIONAL CONNECTIVITY ARE MODULATED BY IMPULSIVITY LEVELS

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Impulsivity (IMP) and sensation seeking (SS) have been associated with vulnerability to drug use and responses to drug challenges. One potential mechanism of this increased risk could be differences in brain physiology, particularly mesocorticolimbic (MCL) areas associated with the abuse-related effects of drugs. We hypothesized that individuals higher on IMP/SS scales would report greater positive responses to an acute d-amphetamine (AMPH) challenge as well as differential function in MCL areas.

Methods: 40 participants (20f) with limited stimulant histories in the top and bottom quartiles of population-derived Zuckerman-Kuhlman IMP/SS scores were recruited. Participants completed a within-subject, counterbalanced, double-blind study to assess the behavioral and neurofunctional effects of intranasal AMPH (0 and 16mg/70kg) administered across two sessions. Following dose administration, brain activity was recorded during completion of go/no-go, monetary incentive delay, and subjective drug effects questionnaire procedures inside a 3-T Prisma functional magnetic resonance imaging (fMRI) scanner. AMPH-induced activation and connectivity changes in MCL regions of interest (ROIs) were then assessed across behavioral procedures ($p < 0.05$, corrected).

Results: Relative to placebo, AMPH significantly increased positive drug ratings (e.g., feeling high), but these effects were unrelated to IMP/SS scores or brain activity. Neurocircuitry was also modulated by AMPH. Following AMPH, connectivity within the striatum decreased while connectivity between the ventral tegmental area (VTA) and ventromedial prefrontal cortex (vmPFC) increased. Additionally, individuals with higher IMP scores showed greater VTA to vmPFC modulation by AMPH.

Conclusions: Following AMPH administration, individuals scoring higher on IMP showed increased connectivity in brain regions involved in reward valuation. Over-valuation of drug rewards is thought to contribute to problematic drug use, and these results reveal a potential mechanism by which impulsive personality characteristics might increase drug-use vulnerability. Further research is needed to explore this possibility and to determine the relationship between IMP/SS, subjective drug response and brain function.

THE CLINICAL GLOBAL IMPRESSION SCALE AS AN OUTCOME MEASURE IN A COCAINE PHARMACOTHERAPY TRIAL

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Treatment
Abstract Category: Original Research

Aim: Determining a successful outcome in cocaine pharmacotherapy trials is a topic of great interest. Currently, abstinence at the end of a clinical trial is the most commonly used outcome measure. However, this outcome may not capture significant improvements in how patients feel and function that are associated with reductions in cocaine use. This secondary analysis examines improvement in drug use and patient overall well-being associated with results on the Clinical Global Impression Scale in a clinical trial of modafinil for treatment of cocaine dependence.

Methods: These data were drawn from a randomized, 8–week, double-blind placebo-controlled trial of modafinil (300 mg daily) for the treatment of DSM IV cocaine dependence involving 93 subjects. Subjects completed the Clinical Global Impression Scale weekly. Additional measures used to characterize drug use and overall health and functioning included:

self-reported drug use, urine drug screens collected 3 x weekly, the Cocaine Selective Severity Assessment (weekly), the Brief Substance Craving Scale (weekly) and the Addiction Severity Index obtained at, baseline, week 5 and end of study (EOS).

Results: Preliminary analyses showed that subjects who rated themselves "much improved" or "very much improved" (VMI/MI) at the end of the trial used less cocaine during the trial and reported improvements in other measures of overall health and functioning. VMI/MI subjects submitted, on average, significantly more benzoylecgonine negative urine drug screens (7.6 vs. 5.0 t= -2.06, p=.04) and were more likely to be abstinent from cocaine for three consecutive weeks (42% vs. 13% □ 2= 8.8 , p=.003). They had significantly lower ASI Composite Scores at EOS on the alcohol use scale (.023 vs. .056, t= 2.3 p =.02) drug use scale (.066 vs. .144, t= 4.1 p<.001) and family/social problem scale (.031 vs. .100 t= 2.7 p=.01).

Conclusions: The CGI may be a useful outcome measure in cocaine pharmacotherapy trials.

KAPPA OPIOID RECEPTOR BINDING AND G-PROTEIN/ARRESTIN COUPLING ACTIVATION BY GR-89696/(GR-103545) BENZENEACTAMIDOPIPERAZINE N4-SUBSTITUTED ANALOGS

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Chemistry
Abstract Category: Original Research

Aim: Kappa opioid receptor (KOPr) agonists are believed to have potential as therapeutics for psychostimulant addiction. The compound GR-89696 (methyl 4-[(3,4-dichlorophenyl)acetyl]-3-(1-pyrrolidinylmethyl)-l-piperazinecarboxylate fumarate), a racemic mix of both isomers, was shown to be a potent and selective kappa opioid agonist, with the R isomer of GR-89696 utilized as a KOPr PET ligand (11C-GR-103545) . Building upon this scaffold, different substituents were added to the N4 position creating novel analogs that were tested in vitro for KOPr binding potency, efficacy, and signaling bias.

Methods: Substitutions at the N4 position of the GR-103545 scaffold were added to produce six novel analogs. All cell assays were performed using KOPr-expressing U2OS cells. [3H]-U69,593 and [35S]GTPγS radioligand binding assays were performed using membranes to evaluate potency and efficacy, and β-arrestin-2 recruitment was evaluated using the DiscoverX PathHunter system on whole cells.

Results: Several GR-103545 analogs maintained the strong KOPr binding potency observed for the original scaffold. GR-89696 and the majority of analogs were found to be unbiased, full agonists at the KOPr, as compared with U69,593. One of the compounds in this series, however, GA2B, was found to be G-protein biased, with substantially higher relative potency in the [35S]GTPγS.

Conclusions: Evaluation of the GR-103545 scaffold and its novel N4 substituted analogs revealed several compounds with considerable activity at the KOPr. In particular, the highly potent KOPr agonist analogs tested here with lower β-arrestin-2 activity may be effective therapeutics for psychostimulant addiction through KOPr activation within the reward system with reduced KOPr mediated side effects (e.g. sedation). Further In vivo studies are needed to assess this potential therapeutic benefit.

A DOPAMINE RECEPTOR ANTAGONIST ACCELERATES THE EXTINCTION OF COCAINE-INDUCED RESPONDING

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: As the access to cocaine during extinction responding would result in the resumption of cocaine self-administration, extinction responding represents a model of the probability of relapse in humans with cocaine use disorder. The compulsion zone theory of cocaine self-administration states that lever-pressing behavior is induced only when concentrations are between the priming and satiety thresholds. If so, then using a dopamine receptor antagonist such as SCH23390 will raise the priming threshold, thereby decreasing the overall time spent within the compulsion zone. After access to cocaine is terminated, this will result in a shortened duration of the extinction phase. Therefore, by shortening the extinction phase the probability of relapse and drug-seeking behavior will be reduced.

Methods: To test this hypothesis, rat (N=3) i.v. cocaine self-administration sessions were run for approximately 2 hours (unit dose = 3 umol/kg). Immediately after access to cocaine was terminated rats were injected with SCH23390 (40 nmol/kg, i.v.) or vehicle and extinction durations were measured.

Results: On average, SCH23390 produced a 50% decrease in extinction time and a significant ($p < 0.01$, student t-test) decrease in the number of extinction lever presses. Within some sessions, lever-pressing behavior was immediately extinguished.

Conclusions: Raising the priming threshold with an antagonist inhibits "drug-seeking" behavior in rats. This study suggests that dopamine receptor antagonists will reduce the time spent drug-seeking and decrease the probability of further cocaine administrations, thereby preventing relapse.

COMPARISON OF THE PHARMACOKINETICS AND TIME COURSE OF EFFECT OF THE FAB FRAGMENT OF A HUMANIZED ANTI-COCAINE MONOCLONAL ANTIBODY IN RATS

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Treatment
Abstract Category: Original Research

Aim: We have developed a humanized anti-cocaine monoclonal antibody, h2E2, that has high affinity for cocaine and a long terminal elimination half-life. Although the traditional approach to determine the pharmacokinetic profile of a drug is to measure drug concentration in timed blood samples, the time course of a drug effect can also provide vital information. Fab fragments have shorter elimination half-lives compared to their whole antibody counterparts.

Using cocaine self-administration, we investigated the time course of effect of the Fab fragment of h2E2 to provide a comparison to the traditional pharmacokinetic method.

Methods: Rats were injected with Fab fragment (82 mg/kg, i.v., PBS, pH=7.4)(n=3) and blood samples collected at designated time points over three days. Fab concentrations in blood samples were quantified using an ELISA assay.

Rats self-administered cocaine HCl at a dose of 3 μmol/kg cocaine (i.v.). When inter-injection intervals stabilized, rats were injected with Fab fragment (82 mg/kg, 1 mL/min, pH=7.4, PBS, i.v.) (n=7) or vehicle control (n=7). Rats resumed self-administration behavior for 5 hours.

Results: The blood concentrations declined in a biexponential manner that was well described by a standard WinonLin two-compartment model. The Fab fragment had a mean distribution half-life ($t_{1/2\alpha}$) of 24.0±3.6 minutes and a terminal elimination half-life ($t_{1/2\beta}$) of 6.9±1.1 hours. The Fab fragment, but not vehicle, accelerated self-administration behavior, which returned to baseline in 4 hours. The effect half-life of the Fab fragment on self-administration behavior was determined to be approximately 101 minutes (1.7 hrs) which is shorter than the reported terminal elimination half-life of approximately 7 hours.

Conclusions: The half-life of the effect of the Fab fragment more closely correlates to the apparent distribution half-life. Therefore, it is likely that the initial decline in Fab fragment concentrations in the blood represents elimination as well as distribution.

ASSOCIATIONS OF POLYGENIC RISK SCORES WITH NEUROCOGNITIVE AND PSYCHIATRIC PHENOTYPES IN OPIATE AND STIMULANT USERS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Genetics
Abstract Category: Original Research
Aim: Genetic association studies of addiction tend to focus on substance use phenotypes, with limited integration of neurobehavioral phenotypes of potentially mechanistic significance. The goal of the current study was to examine associations of polygenic risk scores (PRS) for select substance use outcomes with neurocognitive, psychiatric, and substance use phenotypes in a small but extensively phenotyped sample of Bulgarian substance dependent individuals in protracted abstinence, characterized by predominantly mono-dependent patterns of opiate and stimulant use.

Methods: Participants (N=383) were genotyped with the Smokescreen array and deeply phenotyped with a comprehensive assessment battery, including seven neurocognitive tasks of decisional/'choice' and motor/'action' impulsivity, and personality and psychiatric measures of externalizing and internalizing phenotypes, commonly comorbid with addictions. A series of PRS were calculated based on several large-scale GWAS of phenotypes relevant to substance use outcomes (risk tolerance/risky behavior, cannabis use, alcohol dependence, depression, educational attainment) that included SNPs meeting increasingly stringent p-value thresholds in the discovery GWAS. The PRS were then used to predict neurocognitive, psychiatric, and substance use phenotypes in the Bulgarian sample.

Results: The strongest PRS predictor was based on the first PC of the GWAS 'risky behavior' phenotype, which explained 4.3% of the variance in the antisocial/impulsive factor of the Psychopathy Checklist: Screening Version (PCL:SV) in our Bulgarian sample, previously shown to be the strongest and only common predictor of dependence on 5 different classes of drugs (Vassileva et al., 2019). The 'risky behavior' PRS was also associated with heroin/opioid dependence. Additional associations emerged between educational attainment, sensation seeking, and ability to inhibit prepotent motor responses. Notably, none of the PRS were associated with amphetamine/stimulant dependence in our sample.

Conclusions: Future studies should examine the role of psychopathy in addictive disorders. PRS of other phenotypes such as impulsivity or delay discounting might be more sensitive to stimulant dependence, which needs to be investigated.

A SYSTEMATIC REVIEW OF THE EFFECT OF SEX HORMONES ON STIMULANT USE IN FEMALES

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Other
Abstract Category: Original Research

Aim: Stimulant use disorders (e.g. cocaine and methamphetamine) have distinct trajectories in females as compared to males, with evidence of differences in initiation, maintenance, withdrawal and relapse in both animal and human studies. An explanatory mechanism for this is the role of ovarian hormones (oestrogen and progesterone). While individual pilot trials suggest progesterone may impact on stimulant consumption, no previous reviews have systematically examined the evidence for the role of hormones. We aimed to synthesise literature across pre-clinical and clinical research to provide first evidence to inform potential innovations in hormone treatment for addiction.

Methods: We conducted a systematic review of pre-clinical and clinical studies that focused on the effect of ovarian sex hormones (intervention of interest) on measures of use (outcome of interest) of stimulant drugs (cocaine, amphetamine, methamphetamine, MDMA) by adult human women and adult female animals. We pre-registered our systematic review protocol on PROSPERO (CRD42019133131), with methods following PRISMA guidelines. Evidence was synthesised by hormone (oestrogen; progesterone) and by sub-group (pre-clinical and clinical), with data extraction undertaken by two authors independently using an electronic extraction tool.

Results: We screened 1585 potentially eligible articles, of which 108 were full text screened, with 61 studies meeting inclusion criteria (58 pre-clinical, 3 clinical), with the following preliminary results. Pre-clinical studies largely focused on cocaine across acquisition, consumption and reinstatement phases in intervention studies; with some evidence for progesterone reducing consumption. The 3 clinical studies all examined the effect of progesterone administration on cocaine use; one pilot RCT (n=50) found decreased cocaine use and cocaine relapse in the active group compared to placebo.

Conclusions: Limitations- including variability in models, paradigms, outcome measurement and small sample sizes- precluded quantitative synthesis. However, the review provides preliminary evidence that endogenous or exogenous progesterone reduces stimulant consumption and relapse in females across a range of pre-clinical and clinical studies.

CARDIOVASCULAR SAFETY OF ANS-6637, A REVERSIBLE, SELECTIVE ALDEHYDE DEHYDROGENASE-2 INHIBITOR TO TREAT COCAINE USE DISORDER

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Drug Interactions
Abstract Category: Original Research

Aim: There are no approved medications to treat cocaine use disorder. Mortality caused by cocaine is usually cardiovascular and cocaine produces hypertension and prolongs the cardiac QT interval. Thus, one obstacle in developing a medication for cocaine use disorders is establishing safety in the presence of cocaine; the treatment drug cannot exacerbate cocaine's cardiovascular effects because patients may use cocaine while taking the treatment drug. Preclinical studies suggest inhibiting dopamine in brain reward pathways can reduce the reinforcing effects of cocaine. Some dopamine receptor antagonists looked promising as potential cocaine abuse medications, but animal studies indicated they increased cocaine's pressor effects, suggesting that they would not be safe in cocaine-using patients. The reversible, selective aldehyde dehydrogenase-2 (ALDH2) inhibitor ANS-6637 appears to inhibit use-dependent, cocaine-induced dopamine surges in brain, and it blocks cocaine-self administration and cocaine-primed reinstatement in rats. Disulfiram, a nonselective ALDH and dopamine beta-hydroxylase inhibitor, decreased cocaine use in clinical trials, but it increased QT interval after ethanol (cocaine and alcohol are frequently used together). ANS-6637 does not affect the QT interval after ethanol and did not affect lethality in combination with cocaine in rats. Thus, we examined hemodynamic and cardiac effects of ANS-6637 and cocaine together in conscious, freely-moving telemetered cynomolgus monkeys.
Methods: Animals were dosed with combinations of oral ANS-6637 and intravenous cocaine. ANS-6637 dose levels were selected to yield approximate intent-to-treat plasma concentrations and a 3-fold multiple. Doses of cocaine were administered at the Tmax of plasma ANS-6637.
Results: Intravenous cocaine alone caused dose-related increases in systolic, diastolic and mean arterial blood pressures as expected. ANS-6637 did not affect cocaine-induced hemodynamic effects and, moreover, the combination of ANS-6637 and cocaine did not affect QT interval.
Conclusions: These studies suggest it may be safe to evaluate the effects of ANS-6637 in human clinical studies in combination with cocaine.

D-AMPHETAMINE AND COCAINE SELF-ADMINISTRATION UNDER AN IRT>T SCHEDULE OF REINFORCEMENT IN SPRAGUE DAWLEY RATS

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Behavior
Abstract Category: Original Research

Aim: A risk factor for vulnerability to drug addiction is high impulsivity, one aspect of impulsivity is a deficit in behavioral inhibition. Previous preclinical research with rodents have used an Inter-Response-Time > t (IRT>t) schedule or food reinforcement. No studies have looked at IRT>t responding in rats when i.v. drug is the reinforcer. In the current study we determined whether rats would self-administer cocaine or d-amphetamine on an IRT>t schedule.

Methods: Forty-eight male Sprague-Dawley rats were received at postnatal day 56 and individually housed in shoebox cages, with lights on from 6:00-18:00 hr. After a seven-day acclimation period, animals were trained to lever press under an IRT>1s schedule of food reinforcement, with the schedule increasing across sessions to an IRT>10s. Once food-maintained behavior was stable, all animals underwent catheterization surgery. Following recovery, animals took 15 sessions to acquire cocaine self-administration (0.3 mg/kg/infusion), the IRT value increased from an IRT>1s to a final IRT>10s schedule of reinforcement across daily 2-hour sessions. For d-amphetamine (0.06 mg/kg/infusion) the animals took 21 sessions to acquire self-administration from an IRT>1s to a final IRT>7s schedule of reinforcement. Following acquisition, dose effect curves for cocaine (0, 0.03, 0.1, 0.3 and 1.0 mg/kg/infusion) and d-amphetamine (0, 0.006, 0.01, 0.02 and 0.06 mg/kg/infusion) were completed.

Results: Results indicate that animals could acquire significant and stable levels of cocaine and d-amphetamine self-administration, with cocaine intake being more stable compared to d-amphetamine. Both drugs resulted in inverted-U-shaped functions with peak intake of cocaine and d-amphetamine being 0.3 and 0.02 mg/kg/infusion, respectively. At the peak of the dose effect curves response accuracy tended to decrease in cocaine animals but increase in d-amphetamine animals.

Conclusions: The results indicate that cocaine and d-amphetamine can maintain self-administration in rats under an IRT>t schedule and that the two stimulants have differential effects on behavioral inhibition.

SUBSTANCE USE AND BEHAVIORAL PROBLEMS AMONG METHAMPHETAMINE USERS

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Epidemiology
Abstract Category: Original Research
Aim: Methamphetamine use is a significant and growing public health issue with few effective treatment options. In order to guide the development of treatments for methamphetamine use disorder, it is important to understand characteristics, patterns of illicit drug use, and treatment utilization among individuals using methamphetamine.

Methods: Data from the 2017 National Survey on Drug Use and Health were used to explore illicit drug use and demographic characteristics of non-institutionalized individuals reporting past-year methamphetamine use in the United States. Results were based on weighted estimates.

Results: Past-year methamphetamine use was reported by 1.7 million individuals (prevalence=0.6%). Methamphetamine users were predominantly white (71.2%) and male (66.4%). Nearly 30% were 35-49 years old (28.9%) with the remaining distributed among 18-25 (23.0%), 26-34 (22.9%), and 50+ (22.2%) age groups; only 3.0% were 12-17 years old.

More than half (57.3%) met DSM-IV criteria for methamphetamine use disorder and 38.7% met criteria for another illicit substance use disorder (SUD), including marijuana (15.7%), pain relievers (13.9%), heroin (12.3%), cocaine (11.9%), or tranquilizers (9.7%). Nearly one-third (31.8%) reported ever injecting methamphetamine. Only 26.6% reported any past-year illicit drug treatment. Among those receiving treatment for any illicit drug use, 76.4% reported their last/current treatment was for methamphetamine, most commonly in an outpatient rehabilitation or mental health center setting. In the past year, 25.0% had sold drugs, 12% had sold drugs 10 or more times, 14.8% had stolen anything worth >$50, and 11.6% had attacked someone with the intent to seriously hurt them.

Conclusions: There is substantial overlap of methamphetamine use and opioid use/use disorder as well as other SUD. Despite a high prevalence of methamphetamine use disorder and other SUD among past-year users, few receive treatment. An understanding of this population can help guide development of treatments for methamphetamine use disorder, including pharmacologic treatments.

Club Drugs

NEUROCHEMICAL AND CARDIOVASCULAR EFFECTS OF 4-CHLORO RING-SUBSTITUTED SYNTHETIC CATHINONES IN RATS

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[1]NIDA Intramural Research Program

Abstract Detail: Animal Study
Drug Category: Club/Designer Drugs
Topic: Mechanisms of Action
Abstract Category: Original Research

Aim: Synthetic cathinones are a large class of psychoactive substances, with novel compounds appearing regularly in the non-medical (i.e., recreational) drug market. The aim of this study was to characterize the pharmacology of 4-chloro ring-substituted cathinones, as compared to the effects of 4-methylmethcathinone (mephedrone).

Methods: Synaptosomes were prepared from rat caudate tissue for dopamine transporter (DAT) assays, or from whole brain minus caudate and cerebellum for norepinephrine transporter (NET) and serotonin transporter (SERT) assays. Seven male Long-Evans rats received surgically-implanted telemetry transmitters for the measurement of blood pressure (BP), heart rate (HR), locomotor activity, and body temperature. Rats were placed in experimental chambers for 3 h each weekday, with s.c. drug or vehicle injections administered on Tuesdays and Fridays.

Results: Mephedrone inhibited [3H]neurotransmitter uptake at all three transporters (IC50 at DAT=767 nM, NET=319 nM, and SERT=600 nM). The uptake inhibition properties of 4-chloromethcathinone (4-CMC) were similar to mephedrone (IC50 at DAT=1014 nM, NET=559 nM, and SERT=542 nM), whereas 4-chloroethcathinone (4-CEC) was less potent at NET (IC50 at DAT=1455 nM, NET=2848 nM, and SERT=589 nM). 4-chloro-alpha-pyrrolidinopropiophene (4-CaPPP) showed minimal activity at SERT (IC50 at DAT=569 nM, NET=764 nM, and SERT >10,000 nM). Mephedrone and 4-CMC increased BP, HR, and activity ($p < 0.01$) to a similar extent. 4-CEC and 4-CaPPP were less potent at increasing BP and had minimal effects on HR and activity. 4-CMC and 4-CEC slightly decreased temperature at the highest dose tested (10 mg/kg) in the first hour of the session ($p < 0.05$).

Conclusions: All three 4-chloro ring-substituted cathinones were biologically active, but only 4-CMC had potency comparable to mephedrone. This compound would be expected to have abuse potential similar to mephedrone and could produce adverse effects in humans.

US TRENDS IN ILLICIT USE OF VARIOUS HALLUCINOGENS, 2002-2017, OVERALL AND BY AGE

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Abstract Detail: Human
Drug Category: Other, hallucinogens
Topic: Epidemiology
Abstract Category: Original Research

Aim: Interest is reviving in therapeutic uses of psychedelic drugs (hallucinogens), but illicit use entails risk for adverse consequences. Little is known about time trends in illicit hallucinogen use, and whether such trends differ by age.

Methods: Participants in the 2002-2017 US National Surveys on Drug Use and Health (N=893,602) were examined for trends in perceived risk of LSD, and for trends in illicit hallucinogen use (lifetime LSD, psilocybin; ecstasy; mescaline; PCP; peyote; salvia; ketamine; past-year LSD, ecstasy, PCP, salvia, ketamine) using logistic regression, adjusting for gender, race/ethnicity, age, education, and income. Interaction tests determined if trends differed by age (youth, 12-17; young adults, 18-25; adults, 26+).

Results: In 2017, prevalence of lifetime illicit use ranged by hallucinogen type (from 1.3% for ketamine to 9.6% for LSD). Perceived risk in trying LSD decreased over time across all age groups (-3.9% to -6.5% percentage points). Overall increases occurred in lifetime use of psilocybin, ecstasy, salvia, and ketamine, and in past-year LSD and ketamine (p's .026 to ≤.0001), while lifetime mescaline, peyote, PCP, and past-year PCP and salvia decreased (p's 0.026 to ≤.0001). However, trends differed substantially by age group. Lifetime use generally decreased in youth (percentage point decreases: -0.2% [PCP] to -1.9% [psilocybin]; p=0.003-≤0.0001) and young adults (percentage point decreases: -0.3% [PCP] to -5.6% [LSD]; p≤.0001), and increased in ages 26+ (percentage point increases: +0.1% [past-year ecstasy] to +3.9% [lifetime ecstasy]; p=.039 to ≤.0001). The main exception to this pattern was past-year LSD use, which increased in all age groups (youth, +0.4%; young adults, +2.6%; adults, +.2%; p=0.007 to ≤.0001).

Conclusions: Although trends in prevalence varied between specific hallucinogens, youth and young adults generally showed decreases, while adults age 26+ showed increases. Reasons for these patterns and for increases in past-year LSD use across all age groups require further investigation.

CORRELATES OF METHAMPHETAMINE USE AMONG PERSONS AT DRUG TREATMENT IN MEXICO CITY, MEXICO

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Epidemiology
Abstract Category: Original Research

Aim: To characterize methamphetamine use and determine its correlates among a sample of persons that are currently at drug use treatment centers in Mexico City, Mexico.

Methods: In 2018, persons who use drugs who were living at rehabilitation centers in Mexico City were invited to participate in a survey on substance use and HIV risk behaviors. Bivariate and multivariable logistic regressions were performed to identify the factors associated with lifetime methamphetamine use.

Results: Among 807 participants, 155 (19.2%) reported lifetime methamphetamine use, 7 (7.7%) women and 145 (20.8%) men (p<0.002). Those with methamphetamine use were significantly younger compared to those who had not use methamphetamine (median age 24 vs. 28.5 respectively; p<0.0001). The most common route of administration was smoked (50.4%), followed by inhaled (12.6%). In multivariable analysis, adjusting for age and gender, there was an increased odds of lifetime methamphetamine use among those who had injected drugs (Adjusted Odds Ratios [AOR]= 4.6; 95% Confidence Intervals [CI]= 2.2-9.8), had an informal job (AOR= 1.7; 95% CI= 1.0-2.7) and had been economically supported by a significant other (AOR=2.3; CI=1.2; 4.2). There were no significant associations with HIV risk behaviors and drug treatment experiences.

Conclusions: Persons who use drugs who have injected drugs were more likely to also report lifetime methamphetamine use. Those who have used methamphetamine have a more precarious financial status that depends on others and informal employment. In this clinical sample, there were no differences with HIV risk behaviors by type of drugs used. Future steps include the analysis of current methamphetamine use among a general population in Mexico City.

EXTENSIVE UNDERREPORTING OF DRUG USE AMONG ELECTRONIC DANCE MUSIC PARTY ATTENDEES: INTENTIONAL UNDERREPORTING OR UNKNOWN EXPOSURE?

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Abstract Detail: Human
Drug Category: Club/Designer Drugs
Topic: Epidemiology
Abstract Category: Original Research

Aim: Electronic dance music (EDM) party attendees are a high-risk population for drug use. However, little is known about the extent of underreporting of drug use in this population because use of synthetic drugs such as ecstasy is often associated with unknown exposure to adulterant drugs. We estimated the extent of underreported drug use in this population by comparing self-reported use to hair toxicology results.

Methods: 794 adults entering EDM parties at nightclubs and festivals in New York City were surveyed in 2019 using time-space sampling, and 141 participants provided an analyzable hair sample. Hair analyses were conducted using ultra-high performance liquid chromatography–tandem mass spectrometry. Any amount of drug detected was considered positive detection. We compared hair test results to past-year self-reported use and adjusted prevalence estimates of use by defining use as reporting use or testing positive.

Results: While 82.7% of participants reported use of any illegal drug queried, prevalence increased (by 13.9%) to 96.6% when considering positive toxicology results in light of self-report. Prevalence of cocaine use in particular increased 28.9%, from 51.1% (via self-report) to 80.0% when considering hair test results. Ketamine use increased by 24.8% from 11.2% (via self-report) to 36.0% when considering hair test results and estimated MDMA and

amphetamine use also substantially increased, by 14.9% and 10.3%, respectively, when considering both self-report and hair test results. Two participants tested positive for fentanyl exposure—neither of whom reported heroin use but reported other synthetic drug use, and no underreported use of cannabis, LSD, DMT, MDA, or 2C-B was detected.

Conclusions: We detected extensive underreporting of drug use, with high prevalence of underreporting of cocaine and ketamine in particular. More research is needed to determine whether this is driven by intentional underreporting or unknown exposure via adulterants. Results should inform prevention and harm reduction efforts.

Epidemiology

ASSOCIATIONS WITH GABAPENTIN MISUSE HISTORIES AMONG A SAMPLE OF PEOPLE WHO INJECT DRUGS IN APPALACHIAN KENTUCKY

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Behavior
Abstract Category: Original Research
Aim: Recent reports found that gabapentin is being misused to potentiate the euphoric effects of opioids, self-treat physical pain, and moderate opioid withdrawal symptoms. Examinations of gabapentin misuse among people who inject drugs (PWID) are scant.
Methods: Data are drawn from a mixed methods study examining social ecological factors that influence the uptake of syringe service programs (SSPs) in Appalachian Kentucky. The sample includes 324 PWID who were age 18 and over and reported past month drug injection. Logistic regression models were constructed to examine gabapentin misuse histories among the sample. Data collection and analyses are ongoing.
Results: Participants are male (50.0%); Hispanic (2.2%), Black (1.5%), White (90.7%), and other race/ethnicity (4.6%). Mean age is 37. The most frequently injected drugs included methamphetamine (52.1%), buprenorphine (20.6%), and heroin (12.6%). Participants with gabapentin misuse histories were more likely to report recent (past 90 days) misuse of alcohol, methamphetamine, prescription opioids, benzodiazepines and buprenorphine (p<.037); recent physical pain or discomfort (p<.010); greater daily injection drug use frequencies (p<.007); and were less likely to report a regular source of healthcare and current pain medication prescription (p<.007). In multivariate models, findings related to gender, buprenorphine, and regular source of healthcare remained significant (p<.046).
Conclusions: This is one of the first studies to examine gabapentin misuse among PWID and in a primarily methamphetamine-using sample. It is likely that gabapentin is being misused to moderate the methamphetamine high and/or to potentiate the euphoric effects of buprenorphine. Given the findings related to pain, having a regular source of healthcare, and current prescription for pain medication, it is also likely that individuals with a history of gabapentin misuse are self-treating physical pain. SSPs provide opportunities to educate PWID about the potential dangers of polydrug use involving gabapentin and to connect PWID with needed healthcare and social services.

TEST-RETEST RELIABILITY OF DSM-5 SUBSTANCE USE DISORDER DIAGNOSTIC MEASURES IN CLINICAL SAMPLES

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research
Aim: Although DSM-5 was published almost 7 years ago, little is known about the reliability of DSM-5 substance use disorder (SUD) diagnoses, which are defined quite differently from SUDs in DSM-IV. This study evaluated DSM-5 SUD reliability in patients in addiction treatment and in a large convenience community sample of substance users.
Methods: Adult substance users ≥18 years (N=565) were recruited in two settings: a suburban inpatient rehabilitation hospital, and a research setting where participants were recruited via newspaper and social media ads. Each participant was interviewed twice with the Psychiatric Research Interview for Substance and Mental Disorders, DSM-5 version (PRISM-5). First and second interviews were conducted by different trained clinician interviewers; the second interviewer was always blind to results of the first interview. DSM-5 SUD criteria were assessed for past year and lifetime for alcohol, tobacco, cannabis, cocaine, heroin, opioids, sedatives, hallucinogens, and stimulants. Test-retest reliability was calculated with Cohen's kappa for categorical outcomes and ICC for count outcomes.
Results: In the whole sample, agreement was substantial to excellent (kappa's 0.63-0.94) for binary SUD diagnoses for most substances, and moderate for others (hallucinogens, stimulants, sedatives; kappa's 0.50-0.59). For count outcomes (DSM-5 SUD severity, criteria count measures), ICC were substantial to excellent (0.74-0.99). In addition, the new DSM-5 craving criterion showed excellent reliability for heroin (kappa's 0.84-0.95) and moderate to substantial reliability for the other substances (kappa's 0.49-0.76). Results were generally similar across settings, except for alcohol use disorders, where lifetime and past year kappa's and ICC were consistently higher in the rehabilitation setting (p=0.03 to ≤.0001).
Conclusions: Using rigorous research methodology, DSM-5 SUD diagnoses and dimensional measures were shown to be reliable in varied samples. Consistency across two diverse settings shows robustness of the results and supports the use of the DSM-5 SUD definitions in research.

MOTIVES FOR SUBSTANCE USE IN EVERYDAY LIFE: A SYSTEMATIC REVIEW OF ECOLOGICAL MOMENTARY ASSESSMENT AND DAILY DIARY STUDIES

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Abstract Detail: Human
Drug Category: Other, Alcohol, cannabis, tobacco
Topic: Other
Abstract Category: Literature Review
Aim: The motivational model of substance use posits that four motive subtypes (coping, enhancement, social, conformity) are reasons for substance use and that these subtypes demonstrate unique antecedents and consequences. This model suggests that distinct processes influence motives for substance use between persons and within a person, across time and

situations. Yet, most prior studies assessing this model have utilized cross-sectional designs and global retrospective measures of motives that only allow for between-person evaluations. We systematically reviewed ecological momentary assessments (EMA) and daily diary studies on motives for substance use in daily life to evaluate the degree of support for the motivational model within persons and the validity of global retrospective motives measures.

Methods: We searched PubMed and PsychINFO Databases through September 2019 for peer-reviewed articles that utilized EMA or daily diary methods to examine motives for substance use in daily life or the association between global motives and daily measures (e.g., substance use, affect, mood-drinking relationships).

Results: The search identified 382 publications and, of those, 60 articles were eligible for data extraction and inclusion. In daily life, participants most commonly reported enhancement motives for alcohol use, coping motives for cannabis use, and other motives for tobacco use (i.e., habit). Antecedents (e.g., affect, situational context) and consequences (e.g., substance use) of daily motives were largely consistent with the theoretical predictions of the motivational model. Likewise, global measures of motives were mostly associated with theoretically predicted measures of affect and substance use in daily life. However, global measures of motives did not consistently moderate within-person associations between affect and substance use.

Conclusions: Results of this systematic review generally support the motivational model at the within- and between-person levels of analysis. However, cross-level relationships indicate that EMA vs. global measures of motives might not reflect the same construct. We offer clinical implications and future research directions.

INCREASES IN COUNTY-LEVEL OPIOID PRESCRIBING IN THE UNITED STATES DESPITE NATIONAL DECLINING RATES, 2012-2017

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[1]*University of Florida*

Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Policy
Abstract Category: Original Research
Aim: To measure percent change in opioid prescriptions per 100 persons at the county level in the US in 2017 compared to the rate in 2012.

Methods: We used publicly available Centers for Disease Control and Prevention data for county-level outpatient, all-purpose opioid prescribing for calendar years 2012 and 2017, restricting the analysis to counties that reported data for both years. We calculated percent change in opioid prescribing per 100 residents for each US County and reported descriptive statistics. The distribution of percent changes was mapped using geographic information system software to examine variation.

Results: Among 2,712 counties, the mean opioid prescribing rate per 100 persons was 96.4 (SD 49.9) and 71.8 (SD 35.2) in 2012 and 2017, respectively. The mean percent change in this time period was -17.8% (SD: 1.8) with a median of -26.2%. Compared to the opioid prescribing rate in 2012, 2,412 counties (89%) reported decreases and 300 counties (11%) reported increases in opioid prescribing in 2017. Among the counties that reported increases, 73% were located in rural areas.

Conclusions: There was an overall decrease in county-level outpatient opioid prescribing from 2012 to 2017. However, over 10% of the US counties had significantly increased in opioid prescribing rate in 2017. Future research is needed to identify factors that may contribute to an increase in opioid prescribing.

PAST- YEAR DRUG USE DISORDER AND UTILIZATION OF DRUG REHABILITATION SERVICES AMONG CONSTRUCTION AND EXTRACTION WORKERS IN THE UNITED STATES

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Abstract Detail: Human
Drug Category: Other, Overall Drug Use
Topic: Treatment
Abstract Category: Original Research
Aim: To compare the association between past-year drug use disorder and utilization of drug rehabilitation services between construction trade and extraction workers (CTEW) and other workers in a nationally representative sample of adults in the United States (US).
Methods: These analyses focused on an aggregated sample of the National Survey Drug Use and Health (NSDUH) from 2004 to 2014 (N= 321,145). Past-year drug use disorder was determined by proxy (via survey questions, not a diagnostic interview) using DSM-IV criteria for marijuana, inhalants, hallucinogens, cocaine, heroin, and prescription tranquilizers, opioids, sedatives, and stimulants. Past-year drug or alcohol treatment was based on self-reported drug or alcohol treatment/counseling received in the past 12 months. Logistic regression was used to compare CTEW and non-CTEW with regard to 1) any past-year drug use disorder, and 2) past-year drug or alcohol treatment among those with past-year drug use disorder.
Results: Prevalence of drug use disorder was higher among CTEW (4.9%) as compared to other workers (2.7%; OR: 1.83; 95% CI: 1.67, 2.00). Similarly, among those with past-year drug use disorder, the prevalence of past-year drug or alcohol treatment was higher among CTEW (18.5%) vs. other workers (15.0%; OR: 1.29; 95% CI: 0.99, 1.68). Results from the multivariable model suggest that CTEW have significantly higher odds of past-year drug use disorder (aOR: 1.22; 95% CI: 1.11, 1.36) as compared to other workers while controlling for demographic characteristics. Among those classified as having past-year drug use disorder, CTEW were not significantly different than other workers in receiving treatment for drugs or alcohol in the past year (aOR: 1.14; 95% CI: 0.92, 1.41) while controlling for demographic characteristics.
Conclusions: There is a need to place greater emphasis on the utilization of drug rehabilitation services among CTEW given their elevated odds of drug use disorder.

A LONGITUDINAL ANALYSIS OF THE ASSOCIATION BETWEEN E-CIGARETTES, CIGARETTES, AND MARIJUANA USE IN A NATIONAL SAMPLE OF U.S. ADOLESCENTS

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Abstract Detail: Human

Drug Category: Nicotine/Tobacco
Topic: Adolescent
Abstract Category: Original Research
Aim: We examined the longitudinal association among e-cigarettes, cigarettes, and marijuana use over a four-year period within a nationally representative sample of U.S. youth between the ages of 12 to 17.
Methods: We used four waves of the Population Assessment of Tobacco and Health (PATH) Study[1] data provided by a panel of 12 to 14-year-olds at Wave 1 (n=5299) who completed each of the four annual waves of the adolescent survey. We examined recent use (i.e., past 30-day) of e-cigarettes, cigarettes, and marijuana use at each of the four waves. We used multiple logistic regression to assess the associations between past 30-day marijuana use and past 30-day e-cigarette and cigarette use. Generalized estimating equations (GEE) with an autoregressive correlation structure were used to account for the longitudinal design of the PATH Study.
Results: Over the study period, respondents indicated the following past 30-day prevalence of e-cigarettes, cigarettes, and marijuana use: e-cigarettes only (Wave 1=0.6%, Wave 4=5.2%), cigarettes only (Wave 1=0.9%, Wave 4=3.8%), dual use (Wave 1=0.4%, Wave 4=1.7%), and marijuana use (Wave 1=1.2%, Wave 4=8.4%). Using GEE analysis we found that respondents who engaged in either e-cigarette use only (AOR=7.04, 95% CI=5.31,9.34), cigarette use only (AOR=9.23, 95% CI=6.75,12.6), and dual use (AOR=12.2, 95% CI=8.1,18.5) had increased odds of marijuana use when compared to their peers who did not use e-cigarettes or cigarettes across the four years of the study. Dual users had increased odds of marijuana use when compared to e-cigarette only users. However, no differences in the odds of marijuana use were found between e-cigarette and cigarette only users during the study period.
Conclusions: While dual use of e-cigarettes and cigarettes was strongly associated with marijuana use, both e-cigarette only and cigarette only use was also found to be associated with marijuana use over the study period.

MILITARY EXPERIENCES AND SUBSTANCE USE IN STUDENT VETERANS

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[1]*University of Wisconsin-Milwaukee*

Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Military-related experiences and health are significantly related in military service members, including effects on substance use (SU). However, these relationships in student Veterans have been under-studied. This qualitative study utilized focus groups of student Veterans enrolled in a major-metropolitan university located in the Midwest to determine perceptions of these relationships amongst themselves and their peers. The study's goal is to examine themes that may be related to military experiences and SU following transition back to civilian life.
Methods: Student Veterans (proposed N=20) completed an online demographic survey and were invited to participate in a focus group comprised of other student Veterans. Themes discussed during the focus groups included prompts on 1) prior military experiences, 2) prior/current health, 3) educational experiences and stress that may be associated with

transition to civilian college student life, and 4) available resources on campus and in the community. Transcribed data will then be imported into NVivo for analysis.

Results: Preliminary findings indicate the following relationships: negative effects on security clearance made it easier to not disclose behavioral health problems or seek treatment, particularly if there was a lack of trust; SU affects the entire team as a whole; individuals may consistently fail drug tests, with one almost overdosing during a training exercise; behavioral health/SU may only be discussed after something happens (e.g., suicide, overdose); military system exacerbates behavioral health problems; "CBD is the future" for pain treatment; medical marijuana should also be an option instead of opioid prescriptions.

Conclusions: Student Veterans are a unique population who are not only transitioning back to civilian life, but still coping with negative exposures that may impact current health and well-being. They represent an important subgroup that must not be overlooked, and it is imperative to learn about these relationships directly from them in order to develop effective resources and interventions.

AN UPDATE OF MORTALITY IN THE MELBOURNE INJECTING DRUG USER COHORT STUDY (SUPERMIX)

Penelope Hill*[1], Mark Stoove[1], Paul Dietze[1]

[1]Burnet Institute

Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research

Aim: Mortality estimates among a cohort of people who inject drugs (PWID) have not been investigated in Melbourne, Australia since 2015. In this study, we provide an update of previous mortality estimates among a cohort of PWID in Melbourne utilizing cohort and mortality data between 2008-2019, as well as examining predictors of mortality within the cohort including sociodemographic characteristics, alcohol and other drug use, and health service-related factors.

Methods: We linked participant identifiers from the Melbourne Injecting Drug User Cohort Study (SuperMIX, n=1210) to the National Death Index to estimate standardized mortality ratios (SMRs). Cox regression was used to examine the multivariate relationship between exposures and subsequent mortality.

Results: There were 76 (6.2%) deaths over the study period to date. The mortality rate in the cohort was 1.1 per 100PY (95%CI 0.87-1.37) with an estimated SMR of 16.58 (95%CI 13.24-20.76) overall. Accidental drug-induced deaths accounted for 35 (51.5%) of cause-specific deaths. Reports of 4 or more incarcerations (AHR=1.92, 95%CI 1.02-3.59), past month use of both ambulance and emergency department services (AHR=3.71, 1.97-7.02) were associated with increased mortality risk, and longer durations of injecting were associated with decreased mortality risk [3-9 years duration (AHR=0.30, 0.12-0.73), 9+ years duration (AHR=0.33, 0.15-0.76)].

Conclusions: This paper provided an update of mortality estimates in community-recruited Australian PWID, finding a higher mortality rate than previous Australian estimates. Predictors of mortality include multiple incarcerations and utilization of emergency health services. A longer duration of injecting had a protective effect on mortality risk. Our findings highlight the need to prioritise overdose prevention programs to PWID frequently using emergency health services, PWID upon release from prison, and young PWID recently starting injecting.

FACTORS ASSOCIATED WITH CHANGES IN FOOD INSECURITY AMONG PEOPLE WHO INJECT DRUGS IN LOS ANGELES AND SAN FRANCISCO, CALIFORNIA, 2017-2018

Katherine Bayard[1], *Alex Kral*[2], *Kelsey Simpson*[1], *Lynn Wenger*[2], *Carol Strike*[3], *Jimi Huh*[4], *Ricky Bluthenthal*[4]

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Other
Abstract Category: Original Research
Aim: Food security has been found to be low among people who inject drugs (PWID). The purpose of this study was to determine factors associated with changes in food insecurity score (no change versus worse or better).
Methods: PWID were recruited using targeted sampling methods in Los Angeles, and San Francisco, CA in 2017 and 2018. Data from this analysis come from the 6-month and 12-month observations (n=477) in this cohort study. Food insecurity was measured using the 10-item USDA method. To determine changes in food insecurity, we subtracted the 12-month score from the 6-month score and re-classified results as follows. Those with lower scores were classified as better, those with higher scores were classified as worse, and equivalent scores were classified as no change. Factors considered included demographics (sex, race, age), socioeconomic status (income, education, housing), and heroin, methamphetamine, and cocaine use.
Results: Marginal or lower food insecurity was reported by 80% and 79% of participants at 6-month and 12-month interview respectively. Food insecurity raw score changes were as follows: no change=48%, worse=27%, and better=25%. In multinomial regression analysis with no change as the referent group, demographic, drug use, socioeconomic or service utilization variables were not associated with better (or lower) food insecurity score. A worse (or higher) food insecurity score was associated with being Black (Adjusted odds ratio [AOR]=1.92; 95% confidence interval [CI]=1.19, 3.13) and not being homeless at 12-month interview (AOR=1.66; 95% CI=1.05, 2.63).
Conclusions: Food insecurity is a persistent challenge for PWID. The association between race and worsening food insecurity could be due to discrimination against Black PWID. The surprising inverse relationship between housing and worsening food insecurity requires more research as does the association with race. Nonetheless, integrating food interventions into existing health promotion interventions for this populations is warranted.

SEX DIFFERENCES IN SAFETY EVENTS IN FOUR NATIONAL INSTITUTE ON DRUG ABUSE CLINICAL TRIAL NETWORK (NIDA CTN) SUBSTANCE USE TREATMENT STUDIES

Jacqueline King[1], *Caroline Mulatya*[1], *Margaret Kline*[1], *Kathryn Hefner*[1], *Dikla Blumberg*[1], *Radhika Kondapaka*[1], *Paul VanVeldhuisen*[1], *Robert Lindblad*[1]

[1]*Emmes*

Abstract Detail: Human

Drug Category: Other, Marijuana and Opioids
Topic: Sex Differences
Abstract Category: Original Research

Aim: Previous FDA analyses demonstrate women experience more safety events than men in reaction to therapeutic drug treatment. This study examined sex differences in the proportions of individuals participating in substance use treatment studies reporting at least one AE and at least one moderate or severe AE.

Methods: Four medication-based intervention clinical trials for substance use treatment completed within the National Drug Abuse Treatment Clinical Trials Network (CTN) provided study data. The data were posted on the NIDA Data Share repository between 2015-2019. Men (n = 893) and women (n = 343) were compared to assess the frequency and severity of treatment emergent safety events related to the study drugs: buprenorphine-naloxone (BUP-NX), extended-release injectable naltrexone (XR-NTX), BUP-NX in the presence of XR-NTX, buspirone, and N-acetylcysteine.

Results: The 1,236 participants reported 755 AEs related to study medication. A total of 107 women (31.2%) and 270 men (30.2%) reported a mild, moderate or severe AE related to study drug and did not differ significantly. The proportion of participants reporting at least one moderate or severe AE also did not differ significantly among men (57/270) and women (23/107; p=0.93).

Conclusions: No significant sex differences were found in proportions of safety events across the sample of substance use studies examined. Further analyses conducted show more nuanced data to shed light on these findings. These analyses explore System Organ Classes (SOCs) and AE relationships to study drug within each of the 4 studies.

THE ROLE OF SPIRITUALITY IN NATIVE AMERICAN RECOVERY: AN ANCIENT FRAMEWORK FOR SUSTAINABLE HEALTH AND WELLNESS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Ethnic Differences
Abstract Category: Program Descriptions

Aim: The aim of this program is to improve treatment received by American Indian and Alaska Native (AI/AN) people with substance use disorders (SUDs) by sharing knowledge of AI/AN history, culture, and spiritual healing methods with behavioral health providers. This curriculum is intended to initiate discussions about integrating Western practices and traditional native practices, in order to improve access, reliability, and culturally informed treatment services for native clients with behavioral health disorders.

Methods: This curriculum was developed using qualitative data on cultural practices gathered through consensus panels and listening sessions with tribal members. The curriculum focuses on: 1) the impact of AI/AN historical and inter-generational trauma on the development of SUD and MH disorders among AI/ANs, 2) adoption of a strengths-based, trauma-informed care model on how to work with AI/AN patients, and 3) utilization of culturally-adapted, evidence-based and/or wisdom-based treatment methods in clinical interactions with AI/AN patients with a diagnosed SUD or mental health disorder.

Conclusions: In many AI/AN tribal and urban Indian communities, behavioral health disorders are compounded by issues such as poverty, domestic abuse, and unemployment. However,

according to the Indian Health Service, Native Americans also have one of highest rates of abstinence amongst any other ethnicity or cultural sub-group. This is often overshadowed by many stereotypes and misconceptions of AI/AN communities. By addressing these misconceptions, native healing methods may serve as a virtual link in creating a sustainable, holistic, and measurable path to recovery for person with a SUD.

TRENDS IN INTERNET SEARCH BEHAVIOR FOR SUBSTANCE USE TREATMENT: A MEASURE OF HEALTH SEEKING BEHAVIOR

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research
Aim: As a well-established, low-cost way of assessing public demand in near real time, internet searches could potentially help health officials measure the desire for substance use treatment. This study characterizes internet search data reflecting public interest in substance use treatment in the United States.
Methods: We tracked all Google searches (www.google.com/trends) between 2008 and 2019 originating from the United States that mentioned "quit," "stop," "rehab(s)," "rehabilitation," "treatment(s)" or "addiction" in combination with "drug(s)" (e.g., "find drug treatment"). Additionally, we tracked trends of substance use treatment searches for the following substances: Alcohol (query mentioned "alcohol" or "alcoholism"), cannabis ("cannabis" or "marijuana"), cocaine ("cocaine"), methamphetamine ("methamphetamine" or "meth,"), methylenedioxy-methamphetamine ("mdma," "molly," or "ecstasy"), opioids ("opioid(s)", "OxyContin", "Codeine", "Hydrocodone", "morphine", "Oxycodone", "heroin", "fentanyl"). Measurements are reported as query fractions (QFs), defined as the number of searches per every 10 million searches.
Results: Nationally, the number of non-drug specific searches for substance use treatment were similar across years, with 393 QFs (corresponding to approximately 890,000 searches) in October 2019, the last month data was collected. Alcohol treatment was the most frequently searched treatment, with 208 QFs in October 2019. The greatest increase in treatment searches during the study period was for opioids, with a 624% increase in searches from 2008 to its peak number of searches in April 2018, while searches for heroin treatment increased 249% between 2008 and its peak in March 2016. Searches for cannabis, methamphetamine, and cocaine treatment remained constant during the study period.
Conclusions: Our study identified temporal patterns in substance use treatment searches in the U.S., including a dramatic spike in opioid use treatment searches, consistent with the increased morbidity burden associated with the opioid crisis. Next steps will focus on assessing the geographic heterogeneity of these searches and their potential use to improve the targeting of substance use treatment information.

CLINICAL RESEARCH PREFERENCES AND MOTIVATIONS AMONG PEOPLE WHO USE DRUGS IN RURAL AMERICA

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research
Aim: Despite high morbidity and mortality among people who use drugs (PWUD) in rural America, most clinical research is conducted among urban residents. To advance the evidence improving the health of PWUD in rural areas, we describe the preferences and motivations of PWUD for research participation in rural clinical research studies.
Methods: We conducted a descriptive cross-sectional study using responses from electronically-administered quantitative surveys. We recruited participants at syringe service programs and other community-based settings. Eligible participants reported using opioids or injected any drug to get high within 30 days and resided in high-needs rural counties in Oregon, Kentucky, and Ohio. Participants ranked preferences and motivations for participating in clinical research studies. We aggregated response rankings to identify salient preferences, motivations, and barriers.
Results: 255 participants completed the survey from April-July 2019. Most participants were male (54.5%), completed high school (72.7%), injected methamphetamine (60.8%) or heroin (56.5%) within the last 30 days, and were a mean age of 38 (SD=9.74) years. Financial compensation was the highest-ranked preference (71.8%) and motivation (83.5%) for clinical research participation. Appointment interference with work was the lowest-ranked preference for participation (42.7%). While Kentucky and Oregon participants indicated financial incentive and confidentiality as top preferences for participating in research, Ohio participants identified study information and requirements as their top preference. The primary perceived barrier to research retention was loss of contact due to changes in participant contact information (81.2%). Ohio participants identified transportation as the principal challenge to retention, compared to Kentucky and Oregon participants who noted change of participant contact information.
Conclusions: Beyond financial compensation, clinical research should accentuate confidentiality, practice inclusivity, streamline appointments, utilize various contact methods, and tailor to geographical differences to improve participation and retention among PWUD in rural areas.

CORRELATES OF MANDRAX AMONG ADOLESCENTS AND YOUNG WOMEN IN CAPE TOWN, SOUTH AFRICA

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[1]_RTI International,_ [2]_South African Medical Research Council_

Abstract Detail: Human

Drug Category: Stimulants
Topic: Adolescent
Abstract Category: Original Research
Aim: There is a high prevalence of substance use among youth in South Africa. Substance use behaviors are associated with other public health problems among adolescent girls and young women (AGYW) such as HIV and unintended pregnancy. Methaqualone (Mandrax) is a substance that is unique to South Africa, however little is known about its association with other health outcomes such as alcohol use, mental health, and sexual behavior. Objectives: This study seeks to examine the association between Mandrax use, heavy drinking, sexual behavior, and depressive symptoms among AGYW aged 16 to 19 years old who have dropped out of school in Cape Town, South Africa.
Methods: Baseline data of 500 participants of an ongoing cluster-randomized trial assessing the efficacy of a young woman-focused intervention to reduce substance use and HIV risk was used for this study. After AGYW consented/assented to participate, they completed a urine drug screen and a baseline questionnaire.
Results: Logistic regression, controlling for clustering at the neighborhood level, revealed Mandrax use was significantly associated with increased frequency of heavy drinking (β= 0.03; $p = 0.03$) and depression symptoms (β= 0.07; $p = 0.01$). There was also an association with last condomless sex with a boyfriend (β = - 0.80; $p = 0.08$). However, this finding was not significant.
Conclusions: Our findings highlight the need to address substance use, especially Mandrax use and its associated risk with depression and alcohol use among AGYW in South Africa. Given the depressive effects of Mandrax and alcohol use, the combination of these substances leaves women vulnerable to other risks such as gender-based violence, including sexual violence. Therefore, interventions that aim to reduce gender-based violence should consider addressing the use of Mandrax and alcohol among AGYW.

PATTERNS AND CORRELATES OF CANNABIDIOL USE IN A COHORT OF YOUNG ADULT CANNABIS USERS IN LOS ANGELES

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research
Aim: Cannabidiol (CBD) is a promising therapeutic agent that provides relief for a variety of medical conditions but, unlike tetrahydrocannabinol (THC), with mild or no psychoactive effects. However, little is known about young adult cannabis users who favor CBD-dominant products, and the relationships between CBD use, other drug use, and risk behaviors.
Methods: 186 current cannabis users (both sexes; aged 23-31), with and without medical cannabis recommendation, were surveyed in Los Angeles in March-November of 2019. CBD use was categorized as CBD dominant (at least 1:1 CBD:THC ratio), some CBD, and THC only. First, we conducted descriptive analysis of CBD users' characteristics (i.e., motives for CBD use, health conditions, and CBD forms). Second, we investigated the relationships between CBD use, other drug use, and risk behaviors (i.e., use of high potency cannabis forms,

driving under influence of cannabis (DUIC) while adjusting for relevant confounders by using logistic or negative binomial regression models.

Results: CBD dominant users were primarily female and were more likely to identify as non-Hispanic white compared to THC only users. Oils, creams, sprays, drops and tinctures were the most commonly reported forms among CBD dominant users. CBD users (dominant and some CBD combined) had a greater prevalence of pain and psychological problems compared to THC only users. Related, relief from pain and anxiety were top motivations for CBD use. CBD dominant users were more likely to report using cannabis concentrates, e-cigarettes, illicit ($p<0.05$) and prescription drugs, and higher problematic drug use scores ($p<0.001$) compared to THC only users. No differences were found between CBD use and DUIC, alcohol and conventional cigarette use.

Conclusions: CBD use was associated with histories and motivations linked to pain and psychological problems. Positive associations between CBD use and cannabis concentrates and other drug use may indicate a form of a self-medication for physical and psychological problems.

CORRELATES OF DISPOSITIONAL OPTIMISM AMONG RURAL DRUG-INVOLVED WOMEN

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Dispositional optimism has been shown to correlate to a range of positive health outcomes, but limited research has examined dispositional optimism among individuals who use substances. These studies typically have focused on treatment samples and used the Life Orientation Test-Revised (LOT-R) to measure dispositional optimism. Other research has highlighted the importance of measuring optimism with the LOT-R in diverse groups of drug-using individuals, including those with low socioeconomic status. The present study examined dispositional optimism and its correlates in a sample of out-of-treatment, drug-involved women from an impoverished rural area.

Methods: Four hundred women from three rural jails were randomly selected, consented, and screened. During a face-to-face baseline interview, drug use, physical health, and mental health information was collected, primarily with the GAIN-I. In addition, dispositional optimism was measured by the Life Orientation Test-Revised. Correlations were examined between LOT-R scores and drug use, physical and mental health variables.

Results: The average LOT-R score was 11.34 (SD=5.35). Dispositional optimism positively correlated with GAIN measures of self-efficacy (r=.27, p <.01) and general satisfaction (r=.24, p <.01) and negatively correlated with the GAIN substance problems scale (r= -.15, p <.01) and personality coping style scale (emotional coping) (r= -.33, p <.01). Similar to previous studies, dispositional optimism also negatively correlated with mental health symptoms (r=-.25, p <.01), physical health problems (r= -.18, p <.01), and pain (r= -.19, p <.01).

Conclusions: Dispositional optimism scores were slightly lower than previous studies, which may reflect the significant economic disadvantages of the recruitment area. Despite these lower scores, the correlations between LOT-R and health variables were consistent with other studies,

suggesting it may be appropriate for use with varied samples and that dispositional optimism may be a protective factor for women who use substances.

MISUSE OF PRESCRIPTION MEDICATION FOR SLEEP IN THE UNITED STATES: RESULTS OF THE NATIONAL SURVEY ON DRUG USE AND HEALTH 2015 - 2018

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[1]*University of Florida*

Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research
Aim: Sleep disturbances have been reported by one-third and two-thirds of adults and high-school adolescents in the United States, respectively. Sleep disturbances might be an antecedent or a consequence of multiple drug use disorders. This study aims to estimate the past-year prevalence and correlates of misuse of prescription medication for sleep among adolescents and adults in the United States. We hypothesized that misuse of prescription medications for sleep would be more prevalent among drug users.
Methods: Data from 79,380 individuals 12+ years old who reported past-year use of prescription pain relievers, tranquilizers, or sedatives, and who were surveyed in the 2015-2018 National Study on Drug Use and Health (NSDUH) were included in the analyses. Descriptive and multinomial regression models were conducted to estimate the prevalence and correlates of past-year prescription medication use (but not misuse) - PMU, misuse for sleep, and misuse for other reasons. NSDUH analysis weights were applied to accommodate for the sampling design.
Results: Among all past-year prescription medication users, 4% (95% C.I.= 3.8%, 4.2%) reported last medication misuse for sleep and 10.3% (95% C.I.= 3.8%, 4.2%) for other reasons. Relative to individuals who reported PMU, those who misused prescription medications for sleep were more likely to be white and younger than 50 years old (aIRR ranged from = 1.2 to 1.9). Individuals with a past-year diagnosis of alcohol (aIRR = 4.6, 95% CI = 3.6, 5.8) or cannabis use disorder (aIRR = 8.1, 95% CI = 6.4, 10.2) were more likely to misuse prescription medications for sleep than non-alcohol or non-cannabis users.
Conclusions: Misuse of prescription medication for sleep was common among individuals with drug use disorders. Future studies should examine whether misuse of prescription medication for sleep increases the risk for developing a drug use disorder, or alternatively, modifies the effects or consequences of other drugs used.

ARE DSM-5 SUBSTANCE USE DISORDER CRITERIA INFLUENCED BY USER TREATMENT ENVIRONMENT? AN ITEM RESPONSE THEORY ANALYSIS APPROACH

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Abstract Detail: Human

Drug Category: Other, alcohol, opiates, cannabis, cocaine and tobacco
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: To examine the psychometric characteristics of DSM-5 diagnostic criteria for Substance Use Disorders (SUD) between substance users in harm reduction settings (HR) and substance users seeking treatment (Tx).

Methods: Factor and 2-parameter IRT analysis were used to investigate the dimensionality and psychometric properties of alcohol (n=876), opiates (n=233), cocaine (n=223), cannabis (n=599) and tobacco (n=1142) use disorder criteria (difficulty and discrimination) for each substance among current users. Differential Item and Test Functioning (DIF & DTF) analyses were performed to examine differences in the difficulty of endorsement of the 11 DSM-5 criteria and to test if the criteria set as a whole (the "test") functioned differently by treatment environment (Tx vs. HR). To test DIF, multiple indicator multiple cause (MIMIC) structural equation models were used.

Results: Among 1,489 participants (68% males, mean age 38 years (SD=11)) unidimensionality of the 11 SUD DSM-5 criteria was confirmed. Regardless of the substance, "craving", "large amount", "time spent", "tolerance" and "activities given up" criteria had similar functioning by care settings. Little evidence for DIF was found for other criteria. The criteria set as a whole did not function differently by care settings for alcohol, cocaine and tobacco. For cannabis, compared to HR, the Tx subgroup had a greater number of endorsed criteria. For opiates, compared to HR, the Tx subgroup had a smaller number of endorsed criteria with the same trait severity than Tx subgroup.

Conclusions: The unidimensionality of the 11 SUD DSM-5 criteria and applicability of all criteria and diagnosis was confirmed in this large sample of problematic substance users. While the majority of the loss of control of use criteria functioned well in both care settings, the criteria related to consequences of substances use had several differential functioning.

NON-MEDICAL USE AND INJECTION USE OF PRESCRIPTION OPIOIDS IN SPAIN IN THE NON-MEDICAL USE OF PRESCRIPTION DRUG (NMURX) NATIONAL SURVEY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: To present data on trends and estimated prevalence of opioid prescription drugs misuse and injection use in Spain. To present data in prescription misuse by active pharmaceutical ingredient.

Methods: NMURx is a series of cross-sectional online surveys. NMURx collects data from the adult general population on non-medical use (NMU) of prescription drugs, as well as demographics and behaviors. NMU was defined as use in a way not directed by your healthcare provider. NMURx data from Spain (4Q2018, n=9,945) was analyzed. Calibration weights were applied to represent national adult population distributions. National rates of past 12-month NMU of opioid active pharmaceutical ingredients (codeine, tramadol, morphine, oxycodone)

were calculated. Intravenous use behaviors were calculated among those who reported last year NMU.

Results: Estimated rates of opioid NMU in Spain were high. The rate of NMU per population was highest for codeine, with an estimated 12,207 per 100,000 population (95% CI: 11,208-13,145) adults non-medically using codeine in the past year, followed by tramadol 2,931 per 100,000 population (95% CI: 2,489-3,373), morphine 632 per 100,000 population (95% CI: 465-799) and oxycodone 328 per 100,000 population (95% CI: 238-418). In the other side, the proportion of NMU by injection was highest for morphine (33%; 95% CI: 22-45%), followed by oxycodone (18%; 95% CI: 8-28%), codeine and tramadol.

Conclusions: Spain had high rates of NMU of opioids per population. The rate of NMU per population was highest for codeine among the four opioids studied, while morphine and oxycodone had the highest proportion of NMU by injection.

SPATIAL ANALYSIS OF ALCOHOL OUTLETS AND DRUG OVERDOSE IN BALTIMORE NEIGHBORHOODS

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[1]_Columbia University,_ [2]_Johns Hopkins University,_ [3]_Johns Hopkins Hospital,_ [4]_Michigan State University_

Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Prevention
Abstract Category: Original Research
Aim: Numerous studies have shown that alcohol outlets contribute a unique community risk factor for injury. Few studies have looked at the associations between alcohol outlets and drug overdose. This study aimed to investigate the impact of alcohol outlets on the neighborhood drug overdose rate; to evaluate possible changes in this relationship over time from 2013 to 2017.

Methods: A spatial analysis was conducted using locations of EMS calls for any drug overdose in Baltimore City in 2013 (n=2,330) and 2017 (n=8,454), aggregated to census block groups (n=693). Off-premise settings included grocery and convenience stores, liquor and package stores, and taverns that sell liquor, beer, and wine (n=726); on-premise settings included restaurants, bars, hotels/motels, and entertainment venues (n=530). Negative binomial regression models were used to determine the relationship between alcohol outlet count and overdose count, controlling for other neighborhood factors (e.g., median household income, neighborhood deprivation, segregation, vacant housing). Spatial autocorrelation was assessed and regression inference adjusted accordingly.

Results: Each additional off-premise alcohol outlet was associated with a 14.1% increase in the neighborhood overdose rate in 2013 (IRR=1.14, 95% CI=(1.10, 1.19)); the strength of this association increased to 21.6% in 2017 (IRR=1.22, 95% CI=(1.18, 1.26)), adjusting for other neighborhood variables. On-premise alcohol outlets were marginally significant correlates of neighborhood overdose rate in multivariable models in 2013 (IRR=1.05, 95% CI=(1.01,1.09)) but were not significant in 2017 (IRR=1.02, 95% CI=(0.98, 1.05)), adjusted for other neighborhood covariates. Although information on substances involved in overdose was not available, 31.5% (n=736) of 2013 overdoses and 44.5% (n=3,758) of 2017 overdoses received naloxone.

Conclusions: This study provides preliminary public health evidence for informing policy decisions about alcohol outlet licensing and zoning. Alcohol outlets could be potential community partners for harm reduction strategies such as naloxone distribution or health communication on drug purity or identifying overdose symptoms.

LATENT CLASS ANALYSES OF SUBSTANCE USERS RECRUITED VIA ONLINE CROWDSOURCING PLATFORM IN THE UNITED STATES

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research

Aim: Crowdsourcing tools provide an open forum for individuals to exchange ideas online and represent a promising platform to reach broader populations of substance users, particularly given the criminalization and marginalization of substance use. However, studies exploring the characteristics of substance users within crowdsourcing platforms remain scarce, presenting a missed opportunity to understand the public health needs within these growing digital spaces. We address these gaps by conducting a latent class analysis (LCA) of a study using Amazon Mechanical Turk (MTurk), a leading online crowdsourcing platform used in social science research.

Methods: We enrolled 265 MTurk participants and collected data on substance use, sexual behaviors, and psychosocial scales. LCA was used to identify distinct classes/groups of substance users that best fit the data. Significant predictors of class membership were determined using stepwise logistic regression models.

Results: Four classes emerged: alcohol drinkers only (Class 1), light polysubstance users(Class 2), heavier polysubstance users(Class 3), and abstainers(Class 4). In multivariable logistic regression models, class 1 membership was significantly associated with higher income(aOR=2.16;p=0.02); lower depressive symptoms(aOR=0.44;p=0.02); higher positive affect(aOR=1.44;p=0.049), interest in alcohol reduction(aOR=3.52;p<0.01), fewer sexual partners(aOR=0.76;p=0.03); never testing for HIV(aOR=0.51;p=0.03); and never receiving substance use treatment(aOR=0.20;p=0.049). Class 2 membership was associated with lower positive affect(aOR=0.93;p=0.03); greater sexual partners(aOR=1.46;p<0.01); higher anticipated substance use stigma(aOR=2.00;p=0.01); history of substance use treatment(aOR=4.72;p=0.04); and having a sexually transmitted infection in the past 6 months(aOR=17.1;p<0.01). Class 3 membership was associated with no intention of reducing alcohol(aOR=0.11;p<0.01). Class 4 membership was associated with lower education(aOR=0.5;p=0.03).

Conclusions: This study demonstrates the feasibility of recruiting diverse substance users from the crowdsourcing platform MTurk and identified relevant characteristics to help tailor public health programs including elevated HIV-related risks among polysubstance users. Given the ubiquity of digital spaces and forums, studies should explore the use of crowdsourcing as viable platforms for substance use research and arenas for potential public health interventions.

DECIDING THE EXTENT OF CERTIFIED TRANSLATIONS IN A U.S.-BASED SUBSTANCE ABUSE TREATMENT CLINICAL TRIAL: THE CHOICES-2 EXPERIENCE

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research
Aim: In trials that wish to enroll non-English speakers, current regulations provide relatively little guidance for determining which study assessments should be translated, other than the informed consent form. This presentation describes the procedures utilized to make these decisions (taking into account time and budget constraints) in the NIDA CTN-0067 CHOICES-2 study, an open-label trial of extended-release naltrexone in HIV-infected participants with untreated opioid use disorder.
Methods: All participant-facing documents were determined to require translation by a certified translation company, as they were self-administered by participants. For interview-based assessments (21 total), a team including two bilingual clinicians evaluated the need for translation by using two questions: 1) "Could the meaning of these questions change (and potentially elicit a different response) if the translations were not consistent?" and 2) "Is it acceptable to have potential inconsistencies in these data?" Assessments for which question 1 was "yes" and question 2 was "no" (e.g., eligibility, outcomes, safety) were marked for certified translation. Any "questionable" assessments were translated.
Results: In total, 13 interview-based assessments underwent certified forward-only translation into U.S. Spanish, including the Inclusion/Exclusion Criteria and specific safety and drug-use assessments (including the DSM-5 for Substance Use Disorders, ASI-Lite, Mental and Psychiatric History, and Non-Fatal Opioid Overdose forms). The remaining interview-based assessments (8 total including physical exam, Timeline Followback, Outpatient Naltrexone Induction Log, and Prisoner Status Assessment) were translated via real-time conversation with participants by bilingual staff. Each site was required to have bilingual staff to perform the visits, execute real-time conversational translations of the assessments that were not professionally translated, and complete safety assessments.
Conclusions: This project demonstrates that, in absence of concrete guidance or regulations, a systematic approach and process is required and is feasible to determine which assessments will require certified translation in a substance abuse treatment clinical trial.

BUPRENORPHINE MISUSE AMONG DRUG USERS IN RURAL KENTUCKY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder

Abstract Category: Original Research

Aim: Buprenorphine is an effective treatment for opioid use disorder (OUD). However, inability to access buprenorphine treatment may lead to use of illicitly acquired buprenorphine. This study examines drug use history and motivations for illicit buprenorphine use.

Methods: Participants (n=200) were eligible if they were at least 18 years old, had used any illicit drugs or prescription drugs that were not prescribed to them to get high, and had ever used buprenorphine when not prescribed under a doctor's care. Eligible participants were given an interviewer-administered questionnaire focused on drug use history and experience with buprenorphine. Analysis was conducted using SPSS statistical analysis software.

Results: Most rural drug users initiated drug use in their teens (mean=14.5 years old). The mean age of first illicit opioid use was 18.7 years and mean age of first illicit buprenorphine use was 33.7 years. Many participants (42.5%) reported unsuccessful attempts to access buprenorphine treatment, citing lack of appointments with local providers or shortage of local providers, transportation, and cost. Key motivations for first illicit buprenorphine use included 'To ease/avoid withdrawals' (39.5%), 'To get high' (24.0%), and 'Trying to wean self off other drugs' (22.5%). For most recent illicit use reported, motivations shifted: 'To ease/avoid withdrawals' rose to 52.0%, 'To get high' fell to 16.0%, and 'Wean off other drugs' fell to 4.0%. Maintaining abstinence from other drugs (35.5%) was the second most common motivation for recent illicit use. Most participants (85.5%) said they would prefer to acquire buprenorphine via prescription rather than obtaining it illicitly.

Conclusions: These findings indicate that many individuals with OUD in rural Kentucky use buprenorphine illicitly to self-treat for OUD, in large part due to barriers to treatment access. Improving access to treatment for OUD is an important aspect of addressing the opioid epidemic.

Health Services

PROVIDER DETECTION OF SUBSTANCE USE DISORDERS AMONG HOSPITALIZED MEDICAL INPATIENTS

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Abstract Detail: Human
Drug Category: Other, All substances
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Failure to detect substance use disorders can lead to missed opportunities for referral to substance use treatment (Priester et al., 2016). Among medical inpatient populations, high rates of co-occurring substance use and medical conditions (Bahorik et al., 2017; Owens et al., 2018) put physicians in prime positions to intervene. This analysis aims to provide updated provider detection rates and clinical correlates associated with substance use disorder detection in an inpatient hospital setting.

Methods: Participants (N = 1173) were recruited for a study examining the efficacy of three distinct training methods for implementing a brief motivational intervention targeting substance use in medical impatient settings (Martino et al. 2019). Participants completed a battery of assessments, including a diagnostic interview to assess substance use disorders, and agreed to have their medical record reviewed.

Results: According to sensitivity analyses and t-tests, detection was lowest for cannabis use disorder at 26.0%, which was significantly lower than detection rates of use disorders for tobacco (72.2%, t= -11.9, p<0.001), opiates (65.5%, t= -7.4, p<0.001), cocaine (61.1%, t= -6.4, p<0.001) alcohol (54.4% t= -6.4, p<.001), and other substances (51.1%, t= -4.0, p<0.001). Logistic regressions revealed that detection of substance use disorders varied significantly by age, gender, physical and mental health, patient motivation to change substance use behavior, addiction severity, and length of hospital stay, depending upon the substance use outcome.

Conclusions: The seminal study by Westermeyer and colleagues (1978) over 40 years ago first highlighted abysmal rates of alcohol use detection in hospital settings. The current findings suggest that, although improvements have been made, there is substantial variation in provider detection rates by substance and patient characteristics. Better screening procedures are necessary to enhance detection and provide adequate treatment recommendations, particularly in light of recent marijuana policy changes and the high rates of overdose deaths associated with opioids.

PREDICTING IMMINENT HOMELESSNESS AMONG EMERGENCY DEPARTMENT PATIENTS WITH UNHEALTHY ALCOHOL OR DRUG USE

Kelly Doran*[1], Lillian Gelberg[2], Eileen Johns[3], Marybeth Shinn[4], Ian Wittman[1], Maryanne Schretzman[3], Donna Shelley[5], John Rotrosen[1], Tod Mijanovich[6]

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Prevention
Abstract Category: Original Research
Aim: To develop a screening tool to identify emergency department (ED) patients with unhealthy alcohol or drug use who are at risk for future homelessness. We hypothesized that a brief screening tool could identify at-risk patients with acceptable accuracy.

Methods: We conducted interviews with a random sample of New York City (NYC) public hospital ED patients who screened positive for past year unhealthy alcohol or drug use. Adult patients were eligible if they spoke English/Spanish, were medically stable, and not in prison/police custody. Using patient identifiers, data were linked to NYC shelter administrative databases, which capture 90% of NYC shelters. The primary outcome was future shelter entry, within 6 months of the baseline ED visit.

Results: We interviewed 1,549 ED patients with unhealthy alcohol and/or drug use; 263 (17.0%) were currently homeless. Of the 1,286 patients not homeless at baseline, 78 (6.1%) entered a shelter within the next 6 months. Self-judged risk of shelter entry rated as "somewhat" or "very likely" had 51.3% sensitivity and 20.5% PPV for future shelter entry. A homelessness risk screening tool—developed via predictive modeling plus stakeholder feedback—comprising 3 yes/no questions (shelter use [past year], applied for shelter [past 3 months], incarceration [lifetime]), with an affirmative answer to any question considered a positive screen, had 85.9% sensitivity and 14.4% PPV.

Conclusions: A brief screening tool identified ED patients with unhealthy alcohol or drug use at risk for near-term homeless shelter entry with high sensitivity but relatively low PPV, consistent with paradigms for homelessness prevention that emphasize sensitivity at the expense of "over-serving" people. Other screening tools could be developed with different

sensitivity/PPV balance. Similar tools could be used to identify patients with substance use who might benefit from targeted homelessness prevention services.

IMPACT OF THE INTERNATIONAL COLLABORATIVE ADDICTION MEDICINE RESEARCH FELLOWSHIP FOR PHYSICIANS ON FUTURE ENGAGEMENT IN ADDICTION MEDICINE RESEARCH

Jan Klimas[*][1], Huiru Dong[2], Michee-Ana Hamilton[2], Lauren Gorfinkel[3], Walter Cullen[1], Evan Wood[4], Nadia Fairbairn[4]*

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Abstract Detail: Human
Drug Category: Other, All substances
Topic: Other
Abstract Category: Original Research
Aim: To prospectively evaluate how an international one-year intensive research training program for addiction medicine physicians contributed to subsequent research involvement and productivity.
Methods: The International Collaborative Addiction Medicine Research Fellowship is a U.S. National Institute on Drug Abuse (NIDA)-funded program hosted by the British Columbia Centre on Substance Use (BCCSU) in Vancouver, Canada, a substance-use-focused addiction education, research, and care centre. We compared admitted fellows with non-admitted controls, using baseline questionnaire and peer-reviewed publication rate. Data on participant publications were compared from fellowship enrolment onwards using biomedical databases (eg. PubMed). Additionally, qualitative interviews conducted with nine fellows examined didactic experiences and integration of new skills into addiction medicine research.
Results: Between July 2014 – July 2019, 56 (39 women) physicians enrolled in the study. At baseline, 45 participants reported past research involvement, 18 had one or more advanced graduate degrees (e.g., MPH), and had a median of one peer-reviewed, first author publication (Interquartile Range [IQR] = 0-2). They were internal medicine physicians (n = 8), family physicians (n = 33), psychiatrists (n=5) and others (n = 4), with three-year median length of time in the study (IQR: 2-5). At fellowship completion, there was a significant difference between fellows (n = 25) and controls (n = 31) in total number of publications (Rate Ratio [RR] = 8.33, 95% Confidence Interval [CI], 2.87 – 24.21, p<0.001), as well as first author publications (RR = 3.88, 95% CI, 1.39 – 10.83, p = 0.001). Illustrative quotes provide insights into the impact of the research training process on subsequent engagement in addiction medicine research.
Conclusions: The first five years of fellows' productivity indicate undertaking this fellowship was independently associated with significant research outputs, signalling successful training of addiction physicians to help close the implementation gap between addiction science and clinical practice.

PHYSICIANS' ATTITUDES REGARDING PATIENTS WITH OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: The purpose of this study is to inquire if physicians in South Carolina are asking patients about fentanyl use and examine attitudes about the opioid epidemic and adequacy of treatment options.
Methods: A link to a voluntary survey was posted on the South Carolina Medical Association's monthly newsletter. A REDCap platform was utilized to administer the survey and collect the data.
Results: Preliminary data from the first thirty surveys was included in this ongoing study. The initial data showed that 33% of physicians work in areas with less than 50,000 people and 67% in cities greater than 50,000 people. 80% see patients with an opioid use disorder. The large majority, 93%, did not prescribe buprenorphine and of those 75% were not interested in becoming waivered so they could prescribe buprenorphine. Most (62%) rarely or never asked patients who use heroin about fentanyl exposure. There was no significant statistical difference between those who live in more rural areas (cities less than 50,000 people) compared to those in larger cities ($p=0.6$, unpaired t-test) in fentanyl inquiry. Only 6.7% of participants were testing for fentanyl. Slightly more than half (55%) never prescribed naloxone to patients suspected of abusing opioids with no statistical difference ($p=0.4$) was found between the groups. In the comment section 40% of participants chose "providing safe needle exchange programs that offer patients information about treatment" as an effective strategy to combat the opioid epidemic.
Conclusions: Physicians are not regularly asking patients, including heroin users, about exposure to fentanyl nor are they testing for the presence of the drug. Given the increase in fentanyl-related overdose deaths the identification and treatment of this subset of opioid-using patients is highly important. Preliminary results indicate a lack of interest in prescribing buprenorphine. Further research is needed to examine the barriers of identification and treatment.

PATIENT PERSPECTIVES REGARDING UNIVERSAL SELF-ADMINISTERED SCREENING FOR TOBACCO AND CANNABIS IN A LARGE HEALTH CARE SYSTEM

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Other
Abstract Category: Original Research
Aim: Tobacco and cannabis co-use is common and expected to increase in California with recent legalization of recreational cannabis. Studies have shown increased validity of self-reports of sensitive behaviors through patient self-administered computer-based assessment methods. We sought to understand patient attitudes regarding implementation of a self-

administered computerized universal screener via the EMR patient portal for tobacco and cannabis use and second-hand exposure among all UCLA primary care patients.

Methods: We conducted 3 focus groups with adult UCLA patients (N=23, 91% Female) to explore patient views and experiences in relation to tobacco and cannabis use. Participants discussed thoughts about their primary care physician asking about use and secondhand exposure, for themselves and their children; benefits and concerns of screening; how to implement screening; and neighborhood factors influencing use and exposure. Focus group sessions were audio-recorded, transcribed, and analyzed using content analysis.

Results: Barriers to screening for all patients for tobacco and cannabis use included concern about privacy of records and time spent completing the questionnaires. Some patients felt it was beneficial to screen youth for tobacco and cannabis use, including as an opportunity to educate youth about the consequences of use, while expressing concern that youth may not disclose use due to confidentiality concerns. Patients described neighborhood influences contributing to use, availability of cannabis, and for the youth, peer pressure.

Conclusions: Implementing a patient self-administered computerized tobacco and cannabis screener among primary care patients in a large health system may be a useful tool to provide patient education. However, patients may have concerns about screening that include privacy concerns and ramifications of disclosure, time spent on the screening, and honesty of disclosing use among youth. Understanding patient perceptions of screening for tobacco and cannabis use and exposure, and recommendations for computerized screening, can inform health systems when implementing universal tobacco and cannabis screening.

TRAINING NEEDS FOR BEHAVIORAL HEALTH PROVIDERS IN INDIAN COUNTRY

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Ethnic Differences
Abstract Category: Original Research
Aim: The National American Indian and Alaska Native Mental Health Technology Transfer Center conducted key informant interviews throughout the US over a five-month period. The information gathered will guide training and technical assistance to better meet the needs of behavioral health providers.

Methods: Researchers from the University of Miami Comprehensive Drug Research Center selected participants utilizing a convenience sampling methodology. One on one interviews were conducted (N=40) over a 60-minute period. Informants were contacted through established MHTTC distribution lists and recommendations of national partners. Inclusion criteria were volunteers over 18 years of age serving native clients with behavioral health disorders. These confidential interviews focused on: 1) staff perceptions of delivery and barriers to service, 2) specific clinical training needs, 3) availability of tribal mental health programs, and 4) views on leadership and mentoring.

Results: 93% (37) indicated that leadership training was needed for their staff. Informants expressed a need for training on fiscal management, staff supervision, teamwork, grant writing, transitioning from co-worker to supervisor, grant requirements, project management, technology, and evaluation. In addition, how to build a behavioral health system was viewed

as being needed. All informants indicated they use some sort of tribal program when working with clients.

Conclusions: More training is needed on motivational interviewing, SBIRT, trauma, severe mental health disorders, brief encounters, and working with staff experiencing burnout. There is a need for specific administrative training and mentoring to behavioral health specialists. Guidance is needed on how to create behavioral health systems that include diverse partners. Many billing systems vary by state and are often very complex. There is a need for established mental health providers to mentor other agencies. There is a desire for tribal evidence-based programs with traditional practices being incorporated. Flexibility is needed to take into account that each tribe has its own rituals.

LINKING PATIENTS WITH SUBSTANCE MISUSE TO AN OUTPATIENT SUBSTANCE USE TREATMENT PROGRAM FROM THE EMERGENCY DEPARTMENT VISIT

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Program Descriptions
Aim: The UT HIV Education, Awareness, Referral & Treatment for Substance Use Disorders (HEARTS) Program provides treatment and HIV risk reduction services to members of the public. The emergency department (ED) is a HEARTS recruitment site whereby the clinical care cascade provides emergent treatment and access to inpatient treatment. The HEARTS program is the only source of outpatient treatment for SUD to patients described as 'frequent flyers.'
Methods: HEARTS involves a new and practical mechanism of linking ED patients from a public and a private hospital to an outpatient substance use (SU) disorder treatment program. Research staff use a tablet-delivered Qualtrics survey with patients who admit to current SU during an ED visit. The survey inquires about the prevalence and frequency of SU and condomless sexual behavior. Eligible patients are provided a two-way referral whereby patients 1) receive a flyer about the HEART program and 2) provide their contact information for the HEARTS program coordinator to schedule the initial appointment.
Results: 1,258 ED patients were screened for the HEARTS program from both hospitals (219 private, 1,039 public). Of screened patients, 208 were eligible (33 private, 175 public). The referral was initiated on 143 patients (17 private, 126 public) and made on 114 patients (13 private, 101 public). Of referred patients, 5 showed up to the HEARTS program and completed an intake visit.
Conclusions: The HEARTS program expands the health benefit of an ED visit. Acceptance of a HEARTS referral is cost-effective and can decrease frequent ED visits subsequent to SU disorder. Findings demonstrates that a referral program from the ED for substance use treatment can fill a critically important gap in the healthcare system between discharging a patient versus an inpatient referral. Low acceptance rates suggest that the referral strategy could be enhanced.

PATIENT ATTITUDES TOWARD SUBSTANCE USE SCREENING AND DISCUSSION IN PRIMARY CARE ENCOUNTERS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Alcohol and drug use are often under-identified in primary care settings. While prior research indicates that patients are generally supportive of alcohol screening, less is known about attitudes toward drug screening or the collection of this information in electronic health records (EHRs). As a part of an implementation study of EHR-integrated substance use screening in primary care, conducted in the NIDA Clinical Trials Network, patients were surveyed on their attitudes toward screening for substance use during medical encounters.
Methods: Surveys were administered to patients in four urban academic primary care clinics following the introduction of a screening program. Participants were recruited from the waiting room and self-administered an 18-item survey exploring attitudes toward screening and discussing substance use with healthcare providers.
Results: Participants (N = 479; mean age 54.1; 58% female; 58% white, 23% black; 19% Hispanic/Latino) overwhelmingly felt that they should be asked about their substance use (91%), and deemed it appropriate for their doctor to recommend reducing use if it adversely affects their health (92%). Most (87%) were equally comfortable discussing alcohol or drug use. 63% preferred discussing substance use with their doctor over other medical staff. Responses were mixed regarding screening modality: 55% preferred face-to-face, 22% had no preference, 14% preferred self-administration. Participants reported that they would be honest with their provider (94%), but 32% were concerned about medical record confidentiality.
Conclusions: Primary care patients strongly supported being screened for drug and alcohol use, and would be comfortable discussing it with their doctor. However, patients' concerns about having their substance use documented in their medical record could pose a barrier to achieving accurate responses. These findings suggest a need to educate patients on the confidentiality of medical records and the value of disclosing substance use for their medical care.

SUBSTANCE ABUSE RESEARCH EDUCATION AND TRAINING PROGRAM (SARET)

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Abstract Detail: Human

Drug Category: Other, Substance Use Disorder Research Program
Topic: Substance Use Disorder
Abstract Category: Program Descriptions
Aim: Innovative initiatives are needed to build the ranks of health professionals conducting research on and treating substance use disorders (SUDs). The goal of the NIDA-funded inter-professional Substance Abuse Research Education and Training (SARET) program is to stimulate dental, medical, nursing, social work, and global public health students' pursuit of careers in substance use (SU) research. The program is comprised of three components: six interactive web-modules on core concepts in SUD and research methods reaching thousands of students, an intensive summer mentored SUD research experience for a select group of highly motivated students and the Visiting Mentor Development Program (VMDP) for faculty from around the country who aim to create a SUD mentored research program themselves.

Conclusions: Since the inception of the SARET program in 2008, 131 students have participated in the summer mentored research program. In a follow-up evaluation of SARET participants from the 2008-2014 cohorts (N=65), 46% reported being somewhat or very involved in research, and 64% of these participants were engaged in substance use related research. Participants from this cohort have published 40 articles (12 SUD-related) and completed 50 oral or poster presentations (20 SUD-related). The online curriculum developed by our research team, has been integrated into the curricula of the five NYU health-professional schools and 10 other universities around the country as well as NYU Shanghai School of Social Work and Koç University in Istanbul. To date, approximately 8,500 individuals have completed at least one web module and over 25,000 modules have been completed in total. Five faculty attended the inaugural VMDP this summer and initial feedback has been positive. Long-term follow-up will enable us to assess its effectiveness in fostering mentorship and the development of SUD research mentorship programs in various institutions across the U.S.

OUTPATIENT LINKAGE OF HOSPITAL INITIATED BUPRENORPHINE TREATMENT IN PATIENTS ADMITTED AFTER TRAUMA

Natasha Ludwig-Barron*[1], Elenore Bhatraju[1], Julian Takagi-Stewart[2], Harveen Sandhu[1], Jared Klein[1], Judith Tsui[1]

[1]*University of Washington,* [2]*University of Toronto*

Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Trauma centers may serve as unique points of intervention in screening for opioid use disorder (OUD), initiating treatment and linking patients to outpatient treatment (i.e., buprenorphine). Harborview Medical Center, a level 1 trauma center serving the Pacific Northwest, utilizes an addiction consult team to screen and introduce treatment for opioid use disorders. This is a new service and hospital-based initiation of medications is an emerging area of focus of research. However as of now, there are no studies looking specifically at the trauma population. Using EMR data, this study compares correlates of patients with and without trauma-related injuries who initiated and successfully linked to outpatient treatment.
Methods: Patient records were extracted from the Harborview EMR from January 2018 through June 2019 to include patients age ≥18 years, consulted by an addiction medicine consult service and prescribed buprenorphine at discharge. Exclusion criteria included patients

referred outside of the University of Washington system and those with current buprenorphine prescriptions on admission.

Results: Out of 203 patients, 32% were admitted for trauma-related injuries (n=65). Compared to non-trauma patients (n=138), trauma patients on average were younger (38.8 vs. 43.7 years; p<0.05), more likely to be employed (27.7% vs. 7.2%, p<0.001), more likely to report using cannabis (40.0% vs. 19.6%; p<0.05), less likely to inject drugs (69.2% vs. 81.9%; p<0.05), and were more likely to complete their 30-day follow-up (41.5% vs. 37.7%; p<0.05).

Conclusions: The subset of patients with opioid use disorders who are admitted to the hospital after a trauma appear to be a distinct subgroup with different substance use patterns as well as different outcomes. Providers who serve this population, may have unique opportunities to intervene by offering treatment options and linking them to care.

AN OVERVIEW OF NORTH AMERICA'S FIRST PEER-LED HOSPITAL-BASED OVERDOSE PREVENTION SITE (OPS) AT ST. PAUL'S HOSPITAL IN VANCOUVER, CANADA

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Overdose prevention sites (OPS) provide a safe and monitored space to use illicit substances. St. Paul's Hospital (SPH) in Vancouver, Canada hosts North America's first hospital-based OPS that is entirely run by peer-support specialists (i.e. individuals with lived experience). Accordingly, the overall aims of this study are: (1) to describe utilization patterns of North America's first peer-led hospital-based OPS; (2) to characterize visits to the OPS; and (3) to determine the number of overdose events (both fatal and nonfatal) at the OPS over the study period.

Methods: A retrospective chart review was completed between May 7, 2018 and July 28, 2019.

Results: During the study period, a total of 11,673 visits were recorded, with the monthly number of visits more than tripling between May 2018 and July 2019 (306 versus 1,198 visits respectively). On average there were 26 visits per day. 81% of visits involved clients that identified as being male, 20% reported being an inpatient of SPH, with one-quarter of this population (5% of visits) reporting use of their hospital intravenous line for injection drug use. A total of 39 overdose events were recorded at the OPS during the study; none were fatal. 82% required reversal with naloxone and 28% required transfer to the emergency department at SPH. Overdose events were significantly more common among visits involving inpatients of the hospital compared to those involving clients from the community (0.6% vs. 0.2% respectively, p=0.046).

Conclusions: The St. Paul's Hospital OPS is an example of a successful peer-led hospital-based OPS. Use of the site has increased over time among both community service users and hospital inpatients with no fatal overdose events. Future research should be undertaken to determine the health outcomes of hospital inpatients who access the OPS.

UTILIZING A STANDARDIZED PROTOCOL FOR INCREASING BUPRENORPHINE MULTIPLE PRESCRIPTION REFILLS (MPR)S FOR OPIOID USE DISORDER (OUD) TO LOWER PRESCRIBER BURDEN WHILE RETAINING PATIENT QUALITY OF CARE

Scott Farnum*[1], Erica Cannata[1], Gretchen Hermes[2], Declan Barry[2], Lynn Madden[1]

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: To compare treatment as usual (TAU) with the introduction of a standardized protocol for advancing the number of buprenorphine refills for (OUD) and the impact on prescriber time and patient wait time and satisfaction.
Methods: A standardized protocol was devised and implemented in September 2019 designed to create a low barrier pathway for patients receiving buprenorphine for OUD to increase the number of refills they receive to 5 and decrease the amount of physician time associated with these refills without affecting quality of patient care. Simultaneously these patients were moved to individualized counseling visits once a month where stability was accessed, and appropriateness of continued refills was determined. Prescriber burden, as defined by amount of time spent refilling prescriptions, and % of opioid positive urine toxicologies were determined for 350 patients 3 months before the introduction of the new protocol at the APT Foundation and 3 months after. The APT Foundation is a non-profit community-based organization in Connecticut, which uses an open-access treatment model.
Results: Data Analysis: Prescriber burden and % of opioid positive toxicologies were examined for differences pre- and post- protocol introduction. Results: Prescribers spent 27% less time in direct service care for the same number of patients. Opioid positive toxicology screens were 4.8% pre-introduction and 2.5% post.
Conclusions: The current study found a significant decrease in the amount of time prescribing physicians and APRNs spent treating the same number of patients. Urine toxicology remains steady despite decreased time spent with physicians. Patient satisfaction and wait-time to appointment remain areas for further investigation.

LESSONS LEARNED AND CHALLENGES MET IN THE LAUNCH OF AN OFFICE-BASED OPIOID TREATMENT PROGRAM

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Program Descriptions
Aim: This presentation will outline the lessons learned and challenges faced in launching an Office-Based Opioid Treatment (OBOT) program, descriptive demographic information on those receiving services, and initial engagement/outcome information. The authors anticipate this information will be educational to clinicians, health care providers and administrators in public health settings.

Methods: The Richmond Behavioral Health Authority (RBHA) provides mental health, developmental, substance use disorders, prevention, and crisis services to citizens of Richmond. RBHA recently expanded the continuum of care for substance use disorders services to include an OBOT service in our integrated care clinic. The OBOT program, serving 275 individuals, includes medication-assisted treatment using buprenorphine, individual and group counseling by clinicians and peer specialists, solution-focused brief interventions, care coordination and medication compliance monitoring.

Conclusions: The primary challenges faced by RBHA in launching an OBOT program were related to physical space and accommodating all patients requesting services, recruiting, and retaining buprenorphine-waivered prescribers. From these challenges we have sought to expand our clinic's physical space to be able to treat all those in need and set out to recruit qualified, waivered providers. Our initial outcomes indicate that our OBOT patients are evenly split along gender lines (52% female; 48% male), primarily African American (85%), and have an average age of 44. Initial outcomes also indicate that while we always strive for lower no-show rates, the no-show rates of the OBOT program are lower than that of regular primary care (19% compared with 29%). While our OBOT program is still in its early phases, we have already made improvements and have early outcomes which are encouraging.

SCREENING FOR SUBSTANCE USE IN RURAL PRIMARY CARE – CLINICAL STAFF PERCEPTIONS OF IMPLEMENTATION OF ELECTRONIC HEALTH RECORD-INTEGRATED SCREENING AND CLINICAL DECISION SUPPORT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research

Aim: Substance use screening in rural primary care is not widespread, though substance use disorders (SUDs) are among the leading causes of morbidity and mortality across the United States. As part of a multi-phase study to implement tablet-based screening using the Tobacco, Alcohol, and Prescription Medication Screening (TAPS) Tool and electronic health record-integrated Clinical Decision Support (CDS) in a rural federally qualified health center (FQHC), we conducted focus groups with clinic staff.

Methods: Focus groups were conducted with primary care providers (PCPs) (n = 3 groups, 13 participants) and Medical Assistants (MAs) (n = 3 groups, 19 participants) approximately one-month post-implementation in three clinics from one FQHC in Maine. A combination of rapid analysis and matrix analysis using Proctor's Taxonomy of Implementation Outcomes was used to explore implementation outcomes (acceptability, adoption, feasibility, fidelity, and appropriateness of screening).

Results: Screening was well accepted and adopted in all practices, and found to have minimal interruptions to workflow. The CDS tool is less frequently used, in part due to a low rate of positive screens. MAs reported high fidelity to the screening protocol, which promotes patient self-administered screening. Some discomfort with the CDS tool surfaced among PCPs, mostly linked to a lack of experience treating SUDs, which impacted adoption and fidelity.

The screening and CDS tool's content, credibility, and ease of integration into workflows were notable indicators of implementation success.

Conclusions: Overall, screening for substance use in rural primary care was seen as successful and beneficial by both PCPs and MAs during early implementation.

POST-RELEASE EMERGENCY DEPARTMENT UTILIZATION AMONG A POLYSUBSTANCE COHORT

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research

Aim: The overall purpose of this study was to assess the role of polysubstance use patterns in the utilization of emergency department (ED) utilization 12-months post-release among a cohort of individuals who engaged in pre-incarceration polysubstance use involving opioids.

Methods: Data were collected from 501 currently incarcerated user of opioids entering a Department of Corrections treatment program. Polysubstance use (PSU) was measured through latent profile analysis of pre-incarceration substance use. A six-profile solution was obtained (Primarily Alcohol, Primarily Heroin, Moderate PSU, High PSU, Primarily Suboxone, Stimulant-Opioid). Covariate selection was guided by the Behavioral Model for Vulnerable Populations. Stepwise multivariate logistic regression models were used to predict ED visits 12-months post-release.

Results: Pre-incarceration polysubstance patterns predicted ED visits. Specifically, individuals identified by the 'High PSU' profile (near-daily use of tranquilizers, co-use of opiates 60% of the month, marijuana 45% of month) were more likely to utilize the ED post-release (AOR: 1.76, $p<.05$). In bivariate analyses, individuals in this profile were characterized by significantly worse mental health and more pronounced physical health concerns such as chronic pain. Individuals identified by 'Primarily Heroin' patterns (near-daily use of heroin, co-use of opiates and marijuana 35%+ of month) were less likely to use the ED (AOR: 0.41, $p<.01$) despite bivariate associations with factors associated with increased utilization; this profile had significantly higher rates of prior homelessness, injection drug use, and HCV. Additionally, the vulnerable domain variable of HCV seropositivity predicted use of ED (AOR: 2.84, $p<.001$).

Conclusions: Findings highlight the utility of PSU as a unique predictor of post-release ED visits. The vulnerabilities associated with justice-involvement and PSU are important to this population's utilization of health services and indicate certain PSU populations are at-risk of having their health needs unmet.

RISK SCORE ASSOCIATED WITH IN-HOSPITAL ILLICIT DRUG USE AND PATIENT-DIRECTED DISCHARGE FOR HOSPITALIZED PERSONS WHO INJECT DRUGS

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[1]UAB

Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: To test our hypothesis that a 9-item clinical risk score for hospitalized persons who inject drugs (PWID) is associated with in-hospital illicit drug use (IDU), patient directed discharge, hospital readmission, and/or death.
Methods: This retrospective analysis included PWID with injection-related infections at UAB Hospital (2016 to 2017). In-hospital IDU was defined as suspected/reported drug usage plus confirmatory drug screen. PDD was defined as discharge prior to completion of discharge protocol. We included 30-day readmissions to UAB and deaths referred to county coroners and/or at UAB. We analyzed the frequency of and associations between adverse outcomes and death (2016 - 2019) using McNemar's tests. Logistic regression models identified factors associated with adverse outcomes. Low 9-item risk was <5 and high risk was $\geq$ 5.
Results: Overall, 83 patients met inclusion criteria: 28 (34%) with in-hospital IDU, 12 (14%) PDD, 12 (14%) 30-day readmission, and 9 (11%) died. In hospital IDU was significantly associated with PDD (p=0.003), 30-day readmission (p=0.005), and death (p=0.0003); however, PDD was not associated with these outcomes. After accounting for sociodemographic factors, the risk score was significantly associated with PDD (OR=7.6, p=0.03) and in-hospital IDU (OR=3.2, p=0.04), but not with 30-day readmission nor death.
Conclusions: Illicit drug use, PDD, 30-day readmissions and death were common in hospitalized PWID. Patients who use illicit drugs while hospitalized are significantly more likely to leave early, be readmitted and/or die. Importantly, a 9-item clinical risk score shows promise in identifying this subset of PWID (PDD and/or use drugs while in the hospital) in order to further evaluate them and design interventions to improve their hospital care.

COMMERCIAL INSURANCE AND MEDICAID POLICIES ON OPIOID PAIN PRESCRIPTIONS: 2012-2018

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Policy
Abstract Category: Original Research
Aim: The U.S. opioid overdose epidemic is partly fueled by opioid pain prescriptions. Similar to national trends, Michigan opioid prescriptions per capita peaked in 2012 and then declined. Within Michigan, commercial and Medicaid payer policies may have contributed to this decline. There is a paucity of data regarding implementation of these payer policies. The goal of this study was to determine the number and timing of commercial and Medicaid payer policies focused on opioid pain prescribing. We hypothesize the pace increased after the publication of the CDC Treatment of Chronic Pain guidelines
Methods: We individually categorized policies of six large commercial payers in Michigan and Medicaid fee-for-service across 75 months (2012 through first quarter 2018). Policies, excluding feedback and education of providers, were categorized into one or more of 12 discrete strategies. Data on opioid prescriptions and providers were obtained from the state of Michigan.

Results: The seven payers implemented a total of 455 new strategies across the 75 months with no payer having the same or lagged policies as another. Most common strategy was prior authorizations for initial prescriptions (n=72); least common strategy was provider incentives (n=8). The pace of strategies implemented increased after publication of CDC guidelines (12.5 actions per quarter versus 29.3 actions per quarter, p=.019). Overall, there was a 25% decline in opioid pain prescriptions, 2% decline in prescribers and minimal change in cash prescription purchases (2015-2018).

Conclusions: Commercial and Medicaid regulations on opioid pain prescriptions are complex and rapidly changing with payers implementing a wide range of strategies over a short time period making evaluation of individual policies impossible. Unlike Medicare regulations, the changes were not simply updates. The pace of implementation increased after CDC publication. These policies may have contributed to the decline in opioid pain prescribing and new challenges to accessing required pain medications.

MY NAME IS PEER-LED RECOVERY, AND I NEED A MORAL INVENTORY: TOWARD AN "ETHICS AUDIT" OF RECOVERY SUPPORT SERVICES IN THE US

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Abstract Detail: Human
Drug Category: Other, Treatment commentary; Relevant to all psychoactive drugs
Topic: Treatment
Abstract Category: Theoretical/Commentary

Aim: Some people with substance use disorders (SUDs), after remitting, require ongoing supportive care. What forms should that care take? This is an open question, but, in practice, it was answered by nonprofessional stakeholders before it was asked by medical professionals, addiction scientists, and policymakers. The answer largely revolves around the nearly century-old idea of "recovery." Though working definitions of "recovery" are found in scholarly literature, the concept remains vague, plastic, and subject to interpretation. In spite of, or because of, this vagueness, the US has seen a proliferation of "recovery support services" (RSSs), often peer-led, non-professional, and 12-Step oriented. In some cases, a person with an SUD is referred to an RSS prior to, or in lieu of, medical stabilization and other evidenced-based treatment. Reliance on and promotion of peer-led RSSs has far outpaced critical examination of the scientific and practical merits of the concept of "recovery" and its various operationalizations in RSSs. The aim of this commentary is to lay the groundwork for an "ethics audit," focusing on peer-led RSSs in the US. An ethics audit would identify potential ethical risks of current practices and would propose ways in which those risks might begin to be addressed by funding entities, regulatory bodies, and, with outside support, by RSS providers themselves.

Conclusions: The initial examination presented here identified potentially serious, but potentially remediable, ethical risks associated with peer-led RSSs. These include: practices related to assessment, treatment planning, and maintaining confidentiality; procedures for obtaining informed consent; peer staff competency, knowledge, and training discrepancies, with associated conflicts of interest; ambiguous discharge practices; threats to client autonomy; potential for client stigmatization, decreased self-efficacy, and undue client burden for the "success" metrics of the RSS.

IMPLEMENTING ROUTINE OPIOID OUTCOME MONITORING (ROOM) IN COMMUNITY PHARMACIES: RESULTS FROM A PILOT IMPLEMENTATION-EFFECTIVENESS STUDY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: In response to the rising harms with prescription opioids, recent attention has focused on how to better utilise community pharmacists to monitor outcomes with opioid medicines. Screening and brief intervention (SBI) has an emerging evidence base in a range of substance use disorders. This pilot therefore aimed to test the implementation of software-facilitated Routine Opioid Outcome Monitoring (ROOM).

Methods: Community pharmacies in Victoria and New South Wales, Australia, were recruited to an open label one-arm observational implementation-effectiveness pilot study. Pharmacists completed baseline and follow up interviews to measure change in knowledge and confidence following training on, and implementation of ROOM. Paired t-tests compared pre-post scores. Pharmacy customers that participated were invited to complete a brief evaluation survey. Measure of feasibility and acceptability were collected.

Results: We recruited and trained 64 pharmacists from 23 pharmacies to conduct ROOM. Twenty pharmacies (87%) were able to implement ROOM, with four pharmacies completing the target of 20 screens. Pharmacists completed ROOM with 152 patients in total. Forty-four pharmacists provided baseline and follow-up data which demonstrated significant improvements on identifying and responding to unmanaged pain, depression and opioid dependence. Mean scores at follow-up indicated meaningful scope for further increases in these areas. Responses from pharmacists and pharmacy customers indicated that implementation of ROOM was feasible and acceptable.

Conclusions: Pharmacists' confidence in identifying and responding to opioid-related problems significantly increased from baseline to follow up across several domains, however there is still significant scope to further increase confidence in responding to opioid-related problems. ROOM is feasible and acceptable, though more extensive pharmacist training may assist in developing skills in this challenging clinical area.

HEPATITIS C TESTING AND TREATMENT INITIATION AMONG DRUG DETOX PATIENTS - RISK PERCEPTION AND MOTIVATION: A QUALITATIVE STUDY

Sabrina Assoumou*[1], Carlos Sian[2], Christina Gebel[3], Benjamin Linas[1], Jeffrey Samet[1], Judith Bernstein[3]

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Abstract Detail: Human
Drug Category: Opiates/Opioids

Topic: Other

Abstract Category: Original Research

Aim: The U.S. opioid epidemic is associated with a surge in hepatitis C virus (HCV) infections among persons who inject drugs (PWID). Despite curative therapy and recommendations to treat HCV in active PWID, treatment uptake has been low. We explored HCV risk perception, motivation for testing and barriers to treatment uptake among individuals admitted to a drug detoxification center in Boston.

Methods: In 2019, we conducted in-depth interviews and performed a thematic analysis of coded data.

Results: Participants (N=24) were mean [SD] age, 37 [10] years; 75% White, 13% Black, 2% Hispanic, 4% other. Risk perception was based on unreliable factors such as a drug use partner's appearance (e.g., cleanliness was thought to denote low-risk) and a sexual partner's request for condom use was considered high-risk. Despite receiving results of multiple tests for HCV during interactions with the health care and drug treatment systems, most who tested positive did not progress along the HCV treatment continuum of care. Reasons included the perception of few immediate consequences from a positive test, with possible complications arising far in a poorly imagined future. Active substance use was reported as a major barrier to HCV treatment because of disruptions to everyday activities and the perception that re-infection was almost inevitable. Participants' suggestions to improve treatment uptake included high-touch care with same-day/walk-in options, low-barrier access to substance use treatment, assistance with navigating the health care system, attention to immediate needs such as housing, and the autonomy to select the approach that best fits individual circumstances.

Conclusions: Risk perception was based on unreliable factors. While HCV testing was common, active substance use was a major barrier to treatment initiation. Interventions to improve treatment uptake among PWID should integrate substance use treatment and patient education within high-touch care, tailored to address patients' individual needs and priorities.

Lifespan

THE EFFECTS OF PRENATAL EXPOSURE TO OPIOIDS ON EARLY CHILDHOOD OUTCOMES: CONTEXT MATTERS MOST

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Abstract Detail: Human

Drug Category: Opiates/Opioids

Topic: Perinatal

Abstract Category: Literature Review

Aim: To systematically review the highest quality studies regarding the effects of prenatal exposure to opioids on early childhood outcomes.

Methods: The search strategies were created using a combination of subject headings and keywords and were used to search PubMed, Embase, PsycINFO, CINAHL Plus, and Web of Science from date of database inception to September 30, 2019. This yielded a total of 15,569 citations. These citations were exported to Endnote and 5,349 duplicates were removed, resulting in 10,220 unique citations. For inclusion, studies had to 1) be published in a peer-reviewed language journal (English) 2) include a control group 3) prospectively recruit in the prenatal period 4) blind assessments and 5) not include a considerable number of subjects

prenatally exposed to other non-opioid substances (cocaine, amphetamines, etc.) or HIV. A total of 217 articles met criteria for full text review. Of those articles 11 met inclusion based on above criteria. Two authors independently extracted data and disagreements were resolved by consensus.

Results: (Preliminary) Nine of 11 articles reviewed found that prenatal opioid use was associated with adverse early childhood outcomes in bivariate analysis; however, only 5 articles controlled for other covariates. Four of the 5 found that after controlling for socio-environmental factors, prenatal exposure was no longer significantly associated with cognitive, motor, language, social-emotional development, or anthropologic growth. Final results to be presented at the presentation.

Conclusions: Although several articles reported correlation between prenatal opioid exposure and poor early childhood outcomes, additional investigation is needed to determine the role of socio-environmental factors. This review suggests that socio-environmental factors may be more related to poor early childhood outcomes than prenatal opioid exposure.

EXERCISE, CANNABIS USE, AND MEMORY AMONG ADOLESCENTS: A LONGITUDINAL LATENT INTERACTION MODEL

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[1]*Florida International University*

Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Adolescent
Abstract Category: Original Research

Aim: Research suggests that heavy cannabis use (CU) is associated with memory declines, whereas exercise has been linked to memory improvements. This study examines whether change in exercise (Δexercise) moderates the link between change in CU (ΔCU) and change in memory (Δmemory) among adolescents, such that cannabis-related memory declines will be less pronounced in those reporting increased exercise over time.

Methods: Participants were 401 adolescents (54% male) aged 14-17 at baseline who completed 5 bi-annual assessments (T1-T5) over 2 years. Lifetime CU frequency was assessed at T1-T5. Memory was assessed at T1, T3, and T5 through the California Verbal Learning Test-II and Wechsler Memory Scales-IV Logical Memory and Designs. We used scores from these tests' immediate recall trials to derive a latent memory construct. Exercise (past 6-month hours/week) was assessed at T3-T5 through the Sports & Activity Involvement Questionnaire (n=199).

We used linear growth curve modeling (LGCM) to examine a) change in each variable over time; bidirectional influences between b) CU and memory and c) exercise and memory; and d) ΔCU X Δexercise interaction effect on Δmemory.

Results: LGCMs revealed that CU, b=4.22, and memory, b=.55, increased significantly over time, whereas exercise decreased over time, b=-.94, ps<.05. A combined LCGM of CU and memory revealed that greater baseline CU was associated with worse baseline memory, b=-11.30, and greater increases in CU predicted lesser improvements in memory, b=-.02, ps<.05. A combined LCGM of exercise and memory yielded no significant associations. A final LCGM indicated that the latent interaction between ΔCU and Δexercise did not significantly impact Δmemory, b=.001, p=.90.

Conclusions: Our results replicate well-established findings that greater CU predicts poorer memory cross-sectionally and longitudinally. However, self-reported exercise did not influence this association in our adolescent sample. Future work should employ objective exercise assessments to determine whether exercise can prevent or ameliorate cannabis-related cognitive decline.

INTERNALIZING PROBLEM BEHAVIORS AND LATE ADOLESCENT CIGARETTE SMOKING: A TEST OF THE MODERATING EFFECT OF CHANGING SOCIAL CONTEXTS WITH ADVANCING AGE

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Adolescent
Abstract Category: Original Research

Aim: As evidence for the role of internalizing behaviors in adolescent cigarette smoking involvement remains equivocal, this paper seeks to analyze if, among older adolescents, an individual's age moderates the association between these two variables. In late adolescence, as smoking becomes more normative and access to cigarettes becomes easier with increasing age, the role of these behaviors possibly changes from a protective to a risk factor.

Methods: 503 participants aged 15-18 (mean age 16.6, 70% male) from a high-risk, community-based study were assessed for self-reported internalizing (mean 8.1; S.D. 6.9), and externalizing behaviors (mean 11.05; S.D. 7.2) and peer substance use (mean 0.98; S.D. 0.93). Self-reported cigarette smoking (42% Yes) was then modeled using a generalized linear mixed model.

Results: Externalizing behaviors and peer substance use show robust positive association with cigarette smoking: OR=1.12 ($p<0.001$) and OR=4.27 ($p<0.001$), respectively. However, the relationship of internalizing behaviors with smoking varies with an individual's age (interaction beta=0.07; p=0.003). With advancing age, the beta-coefficient for internalizing behaviors changes from being significantly negative at age 15 (OR=0.87; p=0.004) and 16 (OR=0.94; p=0.03) to non-significant at age 17 (OR=1.01; p=0.77), eventually becoming significantly positive beyond 18 years (OR=1.09; p=0.04 at age=18.1). The association of age with cigarette smoking, meanwhile, is statistically non-significant at low internalizing behaviors (OR=0.75; p=0.18, at internalizing=0) but becomes increasingly positive and significant at internalizing scores above 8 (OR=1.52; p=0.01 at internalizing=10, for instance).

Conclusions: The association between internalizing behaviors and cigarette smoking in late adolescence depends on the individual's age – whereby the role of internalizing behaviors changes from being a protective factor for younger adolescents to a risk marker as individuals transition into young adulthood. The changing social contexts around smoking in this developmental period may account for this varying association of internalizing behaviors with cigarette smoking and, conceivably, also with e-cigarette and marijuana use.

EARLY DETERMINANTS OF ALCOHOL USE TRAJECTORIES FROM ADOLESCENCE TO ADULTHOOD: ANALYSIS OF THE TEMPO COHORT, 1991-2018

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Epidemiology
Abstract Category: Original Research

Aim: Alcohol consumption still ranks among the top three risk factors for mortality and disability in France. This study aims to identify alcohol consumption groups from adolescence to adulthood and to explore factors associated with these groups.

Methods: A sample of 4-16 year olds across France was followed to adulthood in the 6 waves of the TEMPO ("Trajectoires EpidéMiologiques en POpulation") cohort (1991, 1999, 2009, 2011, 2015, 2018). Alcohol consumption trajectories were modelled via Group-Based Trajectory Modeling from age 12 to 44. Multinomial logistic regression was applied to identify individual and parental factors linked to the trajectory groups.

Results: 2278 subjects who reported at least once their alcohol consumption were included in the analysis. Five trajectories were identified: non-drinkers (5.0%), occasional (61.6%), late onset (6.0%), volatile (7.6%) and frequent drinkers (19.9%). Using occasional drinkers as the reference, males had a higher likelihood to be volatile (2.13, 1.52-2.98) and frequent (2.70, 2.14-3.40) drinkers. The odds of late onset (0.38, 0.26-0.57), volatile (0.70, 0.49-0.99) and frequent (0.31, 0.24-0.40) drinking were lower for subjects with an education lower or equal to Baccalauréat+2 level. Grade repetition and having left the parental home before age 18 were further associated with non-drinking. Experimentation with cannabis before age 17 was associated with volatile drinking (3.47, 2.17-5.56). Regular smoking and the experimentation with other psychoactive drugs were related to both volatile and frequent drinking. Suicidal ideation and parental smoking were linked to late onset drinking; parental former smoking and heavy drinking were associated with frequent drinking.

Conclusions: Alcohol consumption follows various multifactorial patterns over time. This study showed that social inequalities begin early in life. A combination of a population-wide strategy and individual-based approach is necessary to tackle the complex and culturally entrenched nature of the different alcohol consumption patterns in the French population.

PATTERNS OF SUBSTANCE USE AND DRIVING UNDER THE INFLUENCE BEHAVIOR AMONG MIDDLE-AGED AND OLDER ADULT DRIVERS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research

Aim: This study aims to 1) determine the prevalence of driving under the influence (DUI) behaviors, 2) assess the association between patterns of cannabis use and DUI behaviors, and 3) identify correlates of DUI behaviors among cannabis users 50 years or older.

Methods: A sample of 1,911 past-year cannabis users, 50 years or older, were analyzed from the 2016-18 National Survey on Drug Use and Health. Multinomial logistic regression was conducted to investigate the association between patterns of past-year cannabis use (reason for use, frequency of use) and past-year DUI behavior (No DUI, DUI Alcohol (DUIA), DUI

Cannabis (DUIC) and DUI Alcohol and Cannabis (DUIAC)), while adjusting for relevant covariates.

Results: Among past-year cannabis users, 9.5% reported DUIA, 14.5% reported DUIC, and 8.3% reported DUIAC. Recreational cannabis use was reported by 84.0% of past-year cannabis users, and 20.6% of past-year cannabis users reported almost daily/daily cannabis use. The reason for cannabis use was not significantly associated with any DUI behavior. However, compared to non-daily cannabis users, almost daily/daily cannabis users were significantly more likely to report DUIC (aOR: 6.15, 95% CI 4.32, 8.75) and DUIAC (aOR: 1.90, 95% CI 1.14, 3.18), but less likely to report DUIA (aOR: 0.25, 95% CI 0.09, 0.70). Those who reported DUIA tended to be White, have higher education, have better self-rated health, and engage in binge drinking while those who reported DUIC reported being male and using other drugs. Adults who reported both DUIAC were younger, male, and engaged in binge drinking and other drug use.

Conclusions: A substantial proportion of middle-aged and older adult cannabis users reported DUIA and/or DUIC. With an increasing number of older cannabis users and older drivers on the road, it is imperative to implement preventative strategies to increase highway safety for all.

CHANGES IN PERCEIVED RISK AND PERCEIVED AVAILABILITY OF MARIJUANA IN THE UNITED STATES BY GENDER AND AGE, 2002-2014

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research

Aim: Marijuana use in the United States has increased steadily since 2007 among adults, with faster increases for men than women resulting in a widening gender gap. Perceived risk and perceived availability of substances can influence individuals' substance use behavior; however, this relationship may differ by gender and may be changing over time in the context of evolving marijuana policies in the United States.

Methods: National Survey on Drug Use and Health 2002-2014 public-use data (n=722,653) were used to create a four-level combined marijuana perceived risk/availability measure. Weighted annual prevalences of perceived risk/availability and 95% confidence intervals were calculated. Time trends and differences by gender, age, and past-year marijuana use were evaluated with linear regression and Chi-square tests using SASv9.2 and Rv3.6.1.

Results: From 2002-2014, the overall proportion of respondents ages 12+ perceiving marijuana as high-risk/easily available (41.6%-29.3%) and high-risk/unavailable (35.8%-29.5%) decreased significantly. Concurrently, prevalence of perceiving marijuana as low-risk/easily available (16.8%-31.2%) and low-risk/unavailable (5.3%-9.5%) increased. More males (21.4%-36.0%) than females (12.4%-26.6%) perceived marijuana as low-risk/easily available in every survey year. Approximately 40% of community-based people 12-17 years old perceived marijuana as high-risk/unavailable; this proportion was similar by gender and stable from 2002-2014. The prevalence of perceiving marijuana as low-risk/easily available increased for all people 18+ years of age (17.0%-31.9%), but was higher for men (22.0%-37.1%) than women (12.3%-27.0%) in all years. Most people who used marijuana in the past year perceived marijuana as low-risk/easily available; this proportion increased each year

(58.6%-78.3%) and differences between men (62.2%-79.8%) and women (53.2%-76.3%) of all ages decreased with time.

Conclusions: Perceptions of the risk/availability of marijuana have changed over time and differ by gender, mirroring heterogeneity in marijuana use. Future work is needed to explore the potential gender- and age-specific influence of medical and recreational marijuana policies on changing perceptions.

OPIOID-INVOLVED POLY-PRESCRIPTION MISUSE IN AGING U.S. ADULTS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: Poly-prescription drug misuse (or, poly-PDM) is common, present in 30-50% of those with any PDM. Poly-PDM is likely associated with greater concurrent risk, as past-year PDM of opioid and benzodiazepine medication is associated with suicidal ideation in older adults, and co-ingestion with PDM is associated with riskier adolescent substance use. Nonetheless, poly-PDM is understudied, with specific patterns and concurrent risks unclear. With a focus on opioid-involved PDM and poly-PDM, our primary aim was to evaluate past-year PDM and poly-PDM prevalence in aging adults, 50 years and older, using data from the NESARC-III.

Methods: Cross-tabulations established prevalence rates of PDM and poly-PDM, and regressions investigated whether past-year poly-PDM was associated with greater odds of past-year psychopathology, specific substance use disorders (SUDs) and poorer health-related quality-of-life, versus abstinence or opioid-only PDM.

Results: Opioid-involved PDM comprised 92.5% of single medication class PDM and 98.6% of poly-PDM; 7.2% of aging adults engaged in opioid-only PDM and 5.7% in opioid-involved poly-PDM. Across outcomes, those with any PDM had higher odds of SUD or psychopathology and had poorer quality-of-life than those abstinent from PDM. Opioid poly-PDM was associated with greater odds of past-year major depression (odds ratio [OR] = 2.85), panic disorder (OR = 4.29), opioid use disorder (OR = 1.67) and nicotine dependence (OR = 3.48) than no past-year PDM or opioid-only PDM (all p-values < 0.01). While odds ratios were highest in those with poly-PDM, odds of past-year social anxiety, GAD, PTSD, alcohol or cannabis use disorder did not differ by poly-PDM status. Finally, mental health-related quality-of-life was lower in those with poly-PDM than either no past-year PDM (p < 0.001) or opioid-only PDM (p < 0.05).

Conclusions: Opioid-involved poly-PDM is associated with poorer mental health and higher prevalence of specific SUDs in aging adults, indicating a need for further study of poly-PDM.

Neurobiology

NALFURAFINE EFFECTS ON KOR-MEDIATED PROLACTIN RELEASE, SEDATION, AND ALTERED COCAINE SELF-ADMINISTRATION IN C57BL6 MICE

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: The kappa opioid receptor (KOR) is part of the larger opioid system that mediates mood and reward, and is under investigation as a potential drug target for addictive diseases. Because activation of the KOR by agonists has been associated with negative side effects in humans and animals, KOR agonists with unique pharmacological properties or behavioral profiles are being explored for their therapeutic potential. Nalfurafine is the only clinically-approved KOR agonist (Japan); it is used to treat pruritus without any significant side effects at recommended doses. It is extremely potent, and in preclinical studies of pain and pruritus, it has been suggested that it could have unique properties compared to other KOR agonists. There are fewer studies, however, comparing nalfurafine with a protoypical KOR agonist in preclinical models of addictive diseases. Here, we compare effective doses of the arylacetamide agonist U50,488 and nalfurafine for several KOR-mediated behaviors in mice.

Methods: Varying doses of U50,488 (0.3mg/kg-30mg/kg) and nalfurafine (0.3µg/kg - 3mg/kg) were tested in male C57BL6 mice for effects on serum prolactin release (30 minutes post-injection, using ELISA), sedation assessed using rotarod assay for up to 1 hour following injection, and intravenous cocaine self-administration (0.5 mg/kg/infusion, FR1). The short-acting KOR antagonist LY2444296 was used to verify KOR specificity of any effects.

Results: The highest non-sedative doses in the rotarod assay were 10µg/kg for nalfurafine and 3 mg/kg for U50,488, both of which yielded a robust KOR-mediated prolactin release of over 200% of baseline prolactin levels (0.3-1.5 ng/ml serum). In self-administration studies, 10µg/kg nalfurafine and 3 mg/kg U50,488 resulted in increased responding for cocaine.

Conclusions: Although nalfurafine is uniquely extremely potent at KOR, it does not have a unique KOR-agonist behavioral profile in mice. Low doses of potent KOR agonists may be able to modulate cocaine-related behaviors without causing sedative side effects.

POTENTIAL CONTRIBUTION OF 7-HYDROXYMITRAGYNINE, A METABOLITE OF THE PRIMARY KRATOM (MITRAGYNA SPECIOSA) ALKALOID MITRAGYNINE, TO THE µ-OPIOID ACTIVITY OF MITRAGYNINE IN RATS

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Abstract Detail: Animal Study
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: A metabolite of the kratom alkaloid mitragynine, 7-hydroxymitragynine, is a more potent µ-opioid receptor (MOR) agonist than mitragynine.

Methods: Here, we investigated if mitragynine is a prodrug that exerts opioid agonist activity, in part, through metabolic conversion to 7-hydroxymitragynine.

Results: The binding affinity of 7-hydroxymitragynine at the human MOR (Ki=78 nM, [3H]DAMGO) was 22-fold lower than morphine and 9.0-fold higher than mitragynine. The % maximum GTP☐S stimulations of 7-hydroxymitragynine and morphine at the MOR were 45% and 90% (≤30 μM, each), respectively. In contrast, mitragynine (≤100 μM) did not significantly stimulate GTP☐S. Following p.o. and i.v. administrations of mitragynine (55 and 5 mg/kg), the plasma Cmax values (UPLC-MS/MS) of 7-hydroxymitragynine (85 and 17.2 ng/mL) were 14- and 84.3-fold less than that of mitragynine, respectively. The Tmax values (p.o.) of 7-hydroxymitragynine and mitragynine were 30 and 84 minutes, respectively. The % metabolite ratio [(AUC7-hydroxymitragynine/AUCmitragynine)*100] was 8% and 3.3% (p.o. and i.v., respectively). In the hotplate assay at 52°C, the % maximum possible effects (MPE, ED50s in mg/kg) of i.v. 7-hydroxymitragynine, i.v. morphine, i.v. and p.o. mitragynine were 100% (1.9), 100% (5.1), 34% (>17.8) and 27% (>178), respectively. Finally, drug discrimination was used as a pharmacologically selective measure of μ-opioid receptor agonism in vivo. In rats discriminating morphine (3.2 mg/kg, i.p.) from vehicle, the discriminative-stimulus effects of mitragynine were assessed 90 minutes after p.o. administration to correspond to its Tmax. Mitragynine (≤178 mg/kg) produced 76% morphine-lever responding (ED50=51 mg/kg).

Conclusions: Though the conversion rate is low, 7-hydroxymitragynine is a more potent and effective μ-opioid receptor agonist than mitragynine, suggesting that the conversion may contribute to the in vivo MOR activity of mitragynine.

CHRONIC METHAMPHETAMINE IS NEUROTOXIC TO SUBSTANTIA NIGRA PARS COMPACTA BUT NOT VENTRAL TEGMENTAL AREA DOPAMINE NEURONS

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Abstract Detail: Animal Study
Drug Category: Stimulants
Topic: Neurobiology
Abstract Category: Original Research

Aim: Methamphetamine (Meth) increases the risk for developing Parkinson's disease (PD) (Curtin et al., 2015). In PD the substantia nigra pars compacta (SNc) degenerates whereas the ventral tegmental area (VTA) is more resistant. Why meth increases PD is unclear. New evidence demonstrates that cytosolic dopamine increases mitochondrial stress due to monoamine oxidase (MAO) metabolism (Graves et al., 2019). Somatodendritic L-type Ca2+ channel (LCC)-dependent mitochondrial stress is present in SNc but not VTA dopamine neurons (Guzman et al., 2010). It is unknown whether LCC-dependent mitochondrial stress is present in axonal compartments. We hypothesize that the combination of axonal MAO- and LCC- dependent mitochondrial stress is necessary for meth-induced degeneration.

Methods: A fluorescent redox biosensor targeted to the mitochondrial matrix was used to assess axonal mitochondrial stress in ex vivo mice brain slices. To investigate degeneration, meth (5mg/kg) was chronically administered to mice for 28 days, tissue collected, and stained for tyrosine hydroxylase to identify SNc and VTA dopamine neurons which were stereologically counted. Mann-Whitney non-parametric tests were used throughout.

Results: Meth (10 μM) increased mitochondrial stress in SNc (Graves et al., 2019) and VTA axons (vehicle: median 0.28; meth: median 0.64, p=0.01, n=11-15); LCC agonism (Bay K8644; 10 μM) increased axonal mitochondrial stress in SNc (vehicle: median 0.34; Bay

K8644: median 0.70, p=0.07, n=13) but not VTA (vehicle: median 0.28; Bay K8644: median 0.28, p=0.82, n=8-15) axons. Chronic meth decreased tyrosine hydroxylase neurons in SNc (vehicle: median 14946; meth: median 11733, p=0.05, n=5-6) but not VTA (vehicle: median 17915; meth: median 19105, p=0.54, n=5-6).

Conclusions: SNc but not VTA neurons were vulnerable to chronic meth-induced degeneration. Meth increased axonal mitochondrial stress in SNc and VTA axons. In contrast, SNc axons also had LCC-dependent mitochondrial stress whereas VTA axons did not.

CHANGES IN NEUROTRANSMITTER SYSTEMS FOLLOWING SYNTHETIC CATHINONE SELF-ADMINISTRATION

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Abstract Detail: Animal Study
Drug Category: Club/Designer Drugs
Topic: Neurobiology
Abstract Category: Original Research
Aim: This research sought to behaviorally differentiate stages of synthetic cathinone abuse using a rodent self-administration model and measure the neurotransmitter profile in multiple brain regions. We hypothesized that stimulant-induced neuroplasticity differed based on mechanism of action, duration of drug exposure, and sex.

Methods: Male and female rats were trained to self-administer α-PVP or mephedrone. Rats self-administered on a fixed ratio 1 schedule of reinforcement for 21 days during daily 1 hr (short access; ShA) or 6 hr sessions (long access; LgA) (n=8/sex/group). Brain tissue from striatum, thalamus, PFC, hippocampus, amygdala, and hypothalamus was profiled with a liquid chromatography electrochemical array to assess neurotransmitters.

Results: Rats acquired synthetic cathinone self-administration. Rats in all groups responded more on the active than inactive lever (p<0.05). There were no effects of sex or sex x lever interactions in self-administration. Rats in the ShA mephedrone, LgA mephedrone, and LgA α-PVP groups showed increased responding across sessions (p<0.05). Some sex differences in neurotransmitter levels were noted. Female LgA and ShA groups had higher serotonin metabolite levels than males in amygdala, PFC, and striatum. Among ShA groups, females showed higher norepinephrine levels than males in hippocampus, PFC, and striatum, while males showed higher norepinephrine levels in amygdala (p<0.05). Comparison of ShA and LgA groups showed that greater drug exposure (LgA) increased glutamate in all six brain regions, but decreased norepinephrine in PFC and thalamus. The dopamine metabolites in striatum showed the largest difference between LgA and ShA, with LgA groups showing much higher metabolite levels than ShA groups (p<0.05).

Conclusions: Synthetic cathinone use may produce differential neurochemical changes during the transition from use to abuse. Consequently, treatment need may differ depending on the progression of synthetic cathinone abuse. Dopaminergic, noradrenergic, and glutaminergic systems were altered, suggesting that compounds affecting those systems might be potential therapeutics for synthetic cathinone use disorders.

Opioid Treatment

COMPLIANCE AND FEASIBILITY STUDY OF A MOBILE APPLICATION FOR PATIENT MONITORING IN OUTPATIENT OPIOID USE DISORDER TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: Opioid use is during treatment is common even among patients receiving agonist medications such as methadone. Behavior in validated neuroeconomic choice tasks, combined with other assessments, can predict opioid use events. The present study sought to examine the feasibility of using a mobile smartphone application to monitor these patient-level predictors of opioid use events among patients receiving methadone treatment.

Methods: Five patients (3 female) receiving methadone treatment for opioid use disorder (60-130mg/daily) in a public safety-net hospital in New York City engaged with a gamified secure mobile application on their own smartphone devices for up to two weeks. Patients completed approximately five minutes of assessments (known to predict reuse) daily, including self-reported substance use, medication compliance, and affective state. Patients additionally completed withdrawal and mood assessments as well as neuroeconomic tasks, including a 36-item delay discounting task (measuring choice impulsivity) and a 32-item assay of decision-making under uncertainty (in the face of known and ambiguous risks). Compensation per week was $10 for enrollment (not contingent on adherence) and a bonus of $0-$66 from one task.

Results: Over 85% of potential subjects in our cohort had a smartphone appropriate for this study. Overall, patients completed 47 of 49 scheduled assessments, even when patients did not adhere to treatment and/or missed clinic visits. On average, participants completed the daily check-in in 1 minute (27s-279s), and both tasks and questionnaires were completed in under 4 minutes. Self-reported substance use and medication adherence agreed with urine toxicology and electronic medical records.

Conclusions: Overall high compliance and relatively low patient burden support the feasibility of mobile applications for capturing clinical and, critically, cognitive variables in outpatient treatment settings using a gamified smartphone platform. Future research will investigate whether these patient-level measures hold similar predictive power when deployed using mobile applications as in in-person research settings.

BUPRENORPHINE WAIVERS AND PRESCRIPTIONS IN CALIFORNIA, 2010-2018

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Abstract Detail: Human
Drug Category: Opiates/Opioids

Topic: Treatment

Abstract Category: Original Research

Aim: Expanding access to buprenorphine for opioid use disorder is a key strategy to combat the opioid crisis. We examined trends in the number and type of buprenorphine-waivered providers and the number of buprenorphine prescribers and patients in California from 2010-2018, during which new national policies allowed Nurse Practitioners (NPs) and Physician Assistants (PAs) to obtain waivers and increased the maximum patient limit to 275.

Methods: We obtained data on buprenorphine-waivered providers in California including month of certification, type of provider (Doctor of Medicine or Osteopathic Medicine [MD/DO], NP, or PA), and patient-limit (30, 100, or 275) for 2002-2018 from the Substance Abuse and Mental Health Services Administration and buprenorphine prescription records for 2010-2018 from California's prescription drug monitoring program. We calculated the number of buprenorphine-waivered providers by provider type and patient limit, as well as the number of unique prescribers and patients prescribing/filling ≥ 60 days supply of buprenorphine (to better capture maintenance prescribing) annually 2010-2018.

Results: By year-end 2010, there were 2,311 waivered providers (1,891 MD/DO 30-patient waivers; 420 MD/DO 100-patient waivers) with a prescribing capacity of 98,730 patients. There were 21,709 patients prescribed buprenorphine ≥ 60 days by 1,905 providers in 2010. By year-end 2018, there were 6,410 waivered providers (4,578 MD/DO 30-patient waivers; 910 MD/DO 100-patient waivers; 217 MD/DO 275-patient waivers; 705 NP/PA waivers) with a prescribing capacity of 313,925 patients. There were 47,220 patients prescribed buprenorphine by 3,464 prescribers in 2018. On average from 2010 to 2018, there was an additional 0.38 providers prescribing buprenorphine ≥ 60 days for each additional waivered provider and an additional 0.12 patients prescribed buprenorphine for each single patient increase in waivered capacity.

Conclusions: Access to buprenorphine increased substantially in California 2010-2018. Given the low ratios of patients to capacity, efforts to expand access may benefit from connecting patients to currently waivered providers.

APPROPRIATENESS OF USING CLINICAL DIRECTNESS TO TREAT PATIENTS WITH OPIOID USE DISORDER

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Abstract Detail: Human

Drug Category: Opiates/Opioids

Topic: Treatment

Abstract Category: Original Research

Aim: We aimed to assess whether and how patients with OUD should be told explicitly that MOUD is the best treatment option.

Methods: We conducted 70 semi-structured qualitative interviews and focus groups in Massachusetts in 2018-2019 with MOUD patients, their family/friends (allies), and MOUD treatment provider staff. Analysis employed a general inductive approach in Atlas.ti 8.

Results: Several scenarios involving OUD patients were identified as being appropriate for a direct clinical communication approach. These included: patients who demonstrate impaired decisional capacity, for example due to co-occurring mental illness or continued opioid or other substance use; patients who are naïve to the different types of MOUD and require education on potential benefits and risks (e.g., due to unsupervised tapering or mixing of medications)

and on how to set safe boundaries; and when supporting patients to meet their recovery goals. Participants expressed disliked of clinical directness when it causes patients to feel subject to, rather than co-creators of, their treatment plan, and when patients perceive their lived OUD experiences are not respected when considering treatment options.

Conclusions: Our findings suggest that clinical directness can promote MOUD induction and continuation, particularly when it is used as a tool to strengthen patient autonomy, knowledge, and competence for recovery.

A PHARMACY-BASED DISPENSING MODEL DECREASES DRIVE TIME TO METHADONE TREATMENT IN FIVE US STATES

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Policy
Abstract Category: Original Research

Aim: The rise in rural opioid overdose mortality and the scarcity of opioid treatment programs (OTP) highlight the need for alternative methadone delivery models in the United States (US). It is unknown if pharmacy-based dispensing of methadone could impact rural geographic access where distance to opioid treatment programs is a barrier. We examined whether the adoption of pharmacy-based methadone dispensing at the four most prevalent chain pharmacies in the US could reduce drive time to the nearest methadone facility among census tracts in five US states with the highest county-rates of opioid overdose mortality.

Methods: We conducted a cross-sectional geospatial analysis of Substance Abuse and Mental Health Services Administration OTP and Wharton Research Data Services chain pharmacy (CVS, Rite Aid, Walgreens, and Walmart) location data within Indiana, Kentucky, Ohio, Virginia, and West Virginia. We included all census tracts with stable geographic boundaries since 2010 and classified them using Rural-Urban Commuting Area codes, a four-level urban-rural classification. Our primary outcome was minimum drive time in minutes from census tract mean center of population to the nearest methadone facility (chain pharmacy versus OTP).

Results: Among 7,947 census tracts (76% urban), median drive time to the nearest chain pharmacy (4.4 minutes, IQR 3.0 – 7.7) was less than drive time to the nearest OTP (19.6, IQR 11.6 – 35.2; $p<.001$) among all census tracts and within each urban-rural classification. The reduction in drive time to the nearest chain pharmacy versus OTP was greater for rural communities [isolated rural 33.8 minutes (IQR 17.1 – 49.1), small rural 36.3 (25.0 – 51.0), large rural 31.5 (16.1 – 44.6), urban 11.5, (6.1 – 19.2; $p <.001$)].

Conclusions: Adoption of pharmacy-based dispensing could expand urban and rural geographic access by reducing drive time to methadone treatment. Pharmacy-based dispensing could mitigate the urban-rural disparity in geographic methadone access within the US.

TIMELY INITIATION AND RETENTION ON MEDICATION-BASED TREATMENT FOR OPIOID USE DISORDER AMONG MEDICAID ENROLLEES IN RHODE ISLAND

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: To employ a cascade of care framework to identify predictors of timely initiation of FDA-approved medications for opioid use disorder (MOUD) and treatment retention; and to determine whether timely initiation of MOUD is associated with higher likelihood of treatment retention.

Methods: This study used de-identified, administrative data of adults enrolled in Rhode Island Medicaid from 2013 to 2018. Timely MOUD initiation was defined as receipt of methadone, buprenorphine, or injectable naltrexone within 7 days of an incident OUD diagnosis (defined as six months of continuous enrollment without an OUD claim). Treatment retention was defined as remaining on MOUD for ≥6 months after initiation, without a gap of >30 days. Covariate information was ascertained at baseline. Multivariable logistic regression was used to determine predictors of MOUD initiation and retention, and the association between timely MOUD initiation and retention in care at 6 months.

Results: A total of 4,840 patients were included in the study, of which 48.1% received at least one MOUD prescription. Of patients who received at least one MOUD prescription, 51.0% initiated MOUD within 7 days of diagnosis, and 39.5% were still receiving MOUD at 6 months. Almost 60% of patients were <45 years old, 45% were female, and >60% were white. Older age, male gender, non-white race, disability, higher comorbidity index, history of pain, the presence of mental health diagnoses, and use of other substances at baseline were independently associated with decreased odds of both MOUD initiation and retention. Timely MOUD initiation was associated with 6-fold increased odds of retention in care (adjusted odds ratios, 6.08; 95% CI, 4.94-7.47) compared with delayed initiation of MOUD.

Conclusions: Efforts to improve the timely initiation of MOUD may be an effective approach to enhance retention in care and reduce risk of opioid-related mortality.

PRELIMINARY PATIENT AND PROVIDER ACCEPTABILITY AND FEASIBILITY RESULTS OF RESET-O(TM): A NOVEL, MOBILE-APP INTERVENTION PROVIDING COGNITIVE BEHAVIORAL THERAPY FOR OPIOID USE DISORDER PATIENTS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: Treatment retention in the OUD patient population remains problematic and strategies to combat this issue is paramount. Mobile applications and telemedicine may be beneficial to OUD treatment. This abstract evaluates patient and provider acceptability and feasibility of a

mobile-app, reSET-O(TM), delivered in conjunction with buprenorphine. reSET-O(TM), provides mobile-based counseling, psychoeducation, and rewards for therapy engagement and drug-negative urines.

Methods: A 24-week pilot feasibility trial adding reSET-O(TM) to standard care for OUD patients initiating buprenorphine was conducted. Eleven out of 15 participants provided feedback after 4-weeks of app use. After 24-weeks of app use, six participants provided feedback. Participant data was collected on the Intervention Acceptability Feedback Form (IAFF), evaluating interest, usefulness, satisfaction, and likeability on a 10-point Likert scale (0=lowest; 10=highest). Further, four providers completed the Weiner Intervention Acceptability, Appropriateness, and Feasibility form (WIAAF), evaluating acceptability, appropriateness, and feasibility of intervention implementation using a 5-point Likert scale (1=lowest; 5=highest).

Results: Out of 15 participants, six withdrew from the trial and clinical treatment; six completed the study and remain in clinical treatment; and three remain in both the study and clinical treatment. Participants ranked the app in the following categories after 4 (N=11), 8 (N=10), 12 (N=10), and 24 (N=6) weeks of app use (M; SD): interest (5.7; 0.60); usefulness (6.8; 0.70); newly learned information (6.3; 0.93); ease of understanding (8.0; 0.84); personal relevancy (7.2; 0.58); satisfaction with app-treatment(7.1; 0.59); and overall likeability (7.1; 1.06).Provider mean scores (SD) after 3-weeks of app use were 13.8 (2.1), 12.5 (2.5), and 15.8 (0.5) for acceptability, appropriateness, and feasibility, respectively.

Conclusions: Exploring and understanding new methods to mitigate OUD treatment retention problems is paramount. Our preliminary data indicates that reSET-O(TM) may be acceptable and feasible for further study regarding treatment retention as a result of app use. Qualitative feedback will be discussed regarding acceptability improvement opportunities.

EVALUATING THE TREATMENT PREFERENCES OF ADULTS WHO USE NON-PRESCRIBED OPIOIDS USING WEB-BASED SAMPLING STRATEGIES

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: Over the past decade, treatment for opioid use disorders has expanded to include long-acting injectable and implantable formulations of medication for opioid use disorder (MOUD), and integrated treatment models that systematically address both behavioral and physical health. Patient preference for these treatment options is underexplored. This study assessed preferences for long-acting MOUD and integrated treatment using an online survey.

Methods: Preferences for MOUD formulation and integrated treatment models were assessed through an online Qualtrics survey. Participants (n=851) were recruited in October and November 2019 through advertisements on Facebook and Google AdWords, posts on four Reddit forums, and tasks posted on Amazon Mechanical Turk (mTurk). Eligible participants scored a two or higher on the opioid pain reliever or heroin scales of the Tobacco, Alcohol Prescription Medication and other Substance Use (TAPS) Tool. Descriptive statistics were calculated using Stata.

Results: In the past year, 824 (96.8%) participants reported non-prescribed use of opioid pain relievers (mean TAPS score=2.72, SD=0.46) and 552 (64.9%) reported concurrent heroin or fentanyl use (mean TAPS score=2.73, SD=0.51). Seventy-four percent of participants (n=631) reported currently or previously receiving treatment for their opioid misuse, with 407 (48.4%) receiving MOUD. When asked about preferences for type of MOUD formulation, 452 (53.1%) preferred a daily oral formulation, 115 (13.5%) preferred an implant, 114 (13.4%) preferred a monthly injection and 95 (11.2%) preferred a weekly injection. Approximately 8.8% (n=75) would not consider MOUD regardless of formulation. The majority of participants (65.2%, n=555) preferred receiving treatment in a specialized substance use treatment program distinct from their medical care compared with receiving care in an integrated model (n=296, 34.8%).
Conclusions: Though the majority of participants preferred receiving short-acting MOUD formulations and treatment in non-integrated settings, the substantial variation in responses suggests that expanding access to all forms of OUD treatment would be beneficial.

INCREASING ACCESS TO RECOVERY RESIDENCES FOR PERSONS USING MEDICATION ASSISTED TREATMENT WHEN RECOVERING FROM AN OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Program Descriptions
Aim: Recovery residences services offered nationally vary by provider including accessibility for those prescribed Medication Assisted Treatment (MAT; specifically, methadone and buprenorphine). This project will increase the number of recovery residences that are willing to provide services to those prescribed MATs and increase the number of recovery residences meeting National Alliance for Recovery Residences (NARR) standards to strengthen the infrastructure of the organization. This presentation describes a project to increase the number of certified recovery residences for persons on MAT in 3 rural areas and 2 major cities in Texas for both men and women in the State of Texas and to evaluate the effectiveness of these residences
Conclusions: This study will inform the recovery field by sharing results of an evaluation the effectiveness of recovery residences who provide services to persons on MAT and documents the extent to which compliance with the standards results in better recovery maintenance.

READINESS TO PROVIDE EMERGENCY DEPARTMENT-INITIATED BUPRENORPHINE: A MULTI-SITE MIXED-METHODS FORMATIVE EVALUATION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Treatment of opioid use disorder (OUD) with buprenorphine decreases opioid use and prevents morbidity and mortality. Emergency departments (ED) can provide buprenorphine to patients who are not currently receiving medications for opioid use disorder (MOUD), though ED providers may vary in their readiness to do so. Our aim was to characterize barriers and facilitators of readiness to initiate buprenorphine for the treatment of OUD in the ED and identify opportunities to promote readiness across multiple prescriber types.
Methods: We conducted a mixed-methods formative evaluation grounded in the Promoting Action on Research Implementation in Health Services (PARiHS) framework of attending physicians, residents and advance practice providers (APPs) from four geographically diverse academic EDs using quantitative surveys (total n=268) and 11 focus groups (total n=74).
Results: Amongst participating providers, 56/268 (21%) indicated readiness to initiate buprenorphine and provide referral for ongoing treatment for ED patients with OUD, and 9/268 (3%) reported DATA 2000 waiver training completion. Prescribers who were ready to initiate buprenorphine scored higher across multiple evidence subscales and on the "resources" context subscale of the ORCA. Key barriers to ED-initiated buprenorphine included lack of training and experience in treating OUD with buprenorphine, concerns about ability to link to ongoing care, and competing needs and priorities for ED time and resources. Key facilitators to ED-initiated buprenorphine included education and training, development of local departmental protocols, and feedback on patient experiences and gaps in quality of care.
Conclusions: Most ED providers are not ready to initiate buprenorphine in the ED. EDs seeking to develop interventions should consider and address the broad array of complex provider and system-level factors to optimize uptake of buprenorphine initiation in the ED.

INCREASED UTILIZATION OF BUPRENORPHINE AND METHADONE AMONG SEATTLE-AREA PERSONS WHO INJECT DRUGS IN 2018 COMPARED TO 2015

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: There is a national effort to increase access to medications for opioid use disorder (OUD). The study aim is to describe utilization of opioid agonist therapy (OAT) among persons who inject drugs (PWID) in the Seattle metropolitan area in 2018, contrasting with results from 2015.
Methods: We used local Seattle area data from the CDC's National HIV Behavioral Surveillance (NHBS) system for 2015 and 2018. Persons aged ≥18 years who injected drugs in the past year were recruited using respondent-driven sampling (RDS). Local supplemental questions assessed whether participants had received methadone or buprenorphine (i.e. OAT) in the past year and analyses were restricted to participants who reported use of any opioids.

We calculated the proportion of PWID who received OAT, stratifying these findings by concurrent methamphetamine use, and assessed whether prevalence of receiving OAT was higher in 2018 compared to 2015 using Poisson regression with robust variance adjusting for demographic factors and RDS methods.

Results: The 2018 sample included 498 PWID who used opioids in the past year, of whom 39.2% (95% CI: 34.8-43.6%) reported past-year treatment with methadone and 21.9% (95% CI: 18.3-25.8%) reported treatment with buprenorphine. PWID who concurrently used methamphetamine were less likely to report methadone treatment than those who did not use methamphetamine (36.7% vs. 47.8%, p=0.035), but more likely to report buprenorphine treatment (25.3% vs. 9.9%, p=0.001). Participants in 2018 were significantly more likely to report past year receipt of buprenorphine (aPR= 4.43; 95% CI: 2.81-7.01) and methadone (aPR= 1.38; 95% CI: 1.02-1.87) compared to 2015.

Conclusions: Among opioid-using PWID in the Seattle area, utilization of OAT, particularly buprenorphine, significantly increased in 2018 compared to 2015. Differences in OAT type among individuals who did and did not use methamphetamines were noted and merit further exploration.

THE INFLUENCE OF MEDICATIONS FOR OPIOID USE DISORDER (MOUD) ON SHORT TERM AND LONG-TERM RESIDENTIAL TREATMENT COMPLETION AND LENGTH OF STAY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: To examine the influence of medications for opioid use disorder (MOUD) on short term (30 days or less) and long term residential treatment completion and length of stay.

Methods: Data on substance use disorder discharge cases where opioids were the primary problem substance were extracted from the 2015, 2016, and 2017 TEDS-D (Treatment Episode Dataset-Discharge) datasets, restricted to short term (n=217,451) and long term (n=143,162) residential treatment settings. Primary outcome variables were treatment completion (compared to dropout or termination by the program) and length of stay. Logistic regression was used to estimate the effect of MOUD on the probability of treatment completion separately for short and long term treatment settings. Logistic regression was used to estimate the effect of MOUD on length of stay > 90 days in long term treatment, and linear regression was used to estimate the effect of MOUD on the number of days in short term treatment. All models controlled for age, sex, race/ethnicity, educational attainment, employment, living arrangement, number of prior arrests, frequency of use, and referral source.

Results: In short term treatment, MOUD was associated with longer treatment duration (β=0.75, p<0.005) and a higher likelihood of treatment completion (OR=1.39, p<0.005). In long term treatment, MOUD was associated with longer treatment duration (OR=1.24, p<0.005) but a lower likelihood of treatment completion (OR=0.71, p<0.005). Model results were resilient to sensitivity tests using different model parameterizations.

Conclusions: In short term residential settings, MOUD increased both treatment retention and completion. In long term residential settings, MOUD was associated with longer length of stay, but lower likelihood for completing treatment, possibly reflecting differences between

MOUD recipients and non-recipients in terms of the chronicity and severity of the disorder. More outcome research is needed that focuses on the effectiveness of MOUD within residential treatment settings given these promising results.

RECENT ECONOMIC EVALUATIONS OF PHARMACOLOGICAL TREATMENT FOR OPIOID USE DISORDER: A SYSTEMATIC LITERATURE REVIEW

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Literature Review
Aim: To summarize recent health economic evidence of pharmacologic treatment of opioid use disorder interventions from 2016 - 2018
Methods: We searched PubMed, PsycINFO, Web of Science, JSTOR, Science Direct, and Google Scholar databases for peer-reviewed studies in English from August 2015 until December 2018 as an update to a 2015 review. We used the Drummond checklist to evaluate and categorize economic evaluation study quality. We summarize results by economic evaluation methodology and pharmacologic treatment modality.
Results: We identified 52 articles as potentially relevant and included 17 (4 cost-offset and 13 cost-effectiveness/cost-benefit). We found strengthened evidence on buprenorphine and methadone indicating these treatments are economically advantageous compared to no pharmacotherapy. Few cost-effectiveness studies used a generic preference-based measure of effectiveness limiting broad comparison across diseases/disorders. The disease/disorder-specific cost-effectiveness measures vary widely suggesting a lack of consensus on the value of substance use disorder treatment.
Conclusions: We found studies that provide new evidence supporting the cost-effectiveness of buprenorphine compared to no pharmacotherapy. We found a lack of evidence supporting superior economic value for buprenorphine versus methadone suggesting both are attractive alternatives. Further economic research is needed on extended-release naltrexone, other emerging pharmacotherapies, treatment modalities, and dosage forms.

OPIOID TREATMENT MOBILE APPLICATION (OPTIMA) TO REDUCE RELAPSE AMONG ADULTS RECEIVING OUTPATIENT MAT: FACTORS INFLUENCING DAILY OPIOID CRAVING

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Technology Issues
Abstract Category: Original Research

Aim: We are conducting an ongoing experimental trial of the smartphone app OPTiMA (Opioid Treatment Mobile Application) that we developed as an adjunctive therapy to reduce relapse among adults receiving outpatient medication assisted treatment (MAT) for opioid use disorder (OUD). We provide preliminary findings on factors influencing participants' daily self-report of craving intensity.

Methods: Adult men and women receiving MAT for OUD at the University of Arkansas for Medical Sciences (UAMS) were invited to participate in a three-month non-randomized experimental trial of OPTiMA. Participants attended a one-hour intake session, during which research staff obtained written informed consent, installed OPTiMA on participants' smartphones, and provided training in OPTIMA's use. Participants used OPTiMA to record daily self-reports (via 10-point Likert scales) of craving intensity, withdrawal severity, stress, anger, and depression for the previous day. Participants also recorded illicit opioid use, alcohol use (beer-units), and marijuana use (gram-units). After completing daily self-reports, participants received personalized feedback to promote continued abstinence. Participants also received daily SMS reminders to complete their self-reports. As a secondary analysis, we conducted linear mixed-effect models to identify predictors of daily opioid craving.

Results: To date, we have enrolled seven participants (4 female, 3 male; 6 Caucasian, 1 African-American; median enrollment duration=25 days, range=14-49 days). All participants reported continued abstinence from illicit opioid use. After FDR correction (p=0.05), four variables significantly predicted daily self-reported opioid craving: daily rating of stress severity (beta=0.51, t(89)=5.56, p<0.001), symptoms of depression (beta=0.54, t(89)=4.91, p<0.001), anger (beta=0.35, t(89)=3.61, p<0.001), and withdrawal symptoms (beta=0.40, t(89)=3.28, p<0.002). Conversely, daily use of alcohol or marijuana did not significantly predict opioid craving.

Conclusions: Despite their preliminary association, we report that daily fluctuation in opioid craving is strongly predicted by fluctuation in stress, depression, withdrawal, and anger, confirming their import as targets of OPTiMA-based intervention to boost abstinence. Study recruitment is ongoing.

RETENTION IN MEDICATION TREATMENT FOR OPIOID USE DISORDER AMONG PRIMARY CARE PATIENTS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: Opioid use disorder (OUD) continues to be a significant public health crisis in the United States (US). Medication for OUD (MOUD) can be administered within primary care and is effective; however, little is known about the patient characteristics associated with MOUD treatment retention in this setting. This study examined patient characteristics associated with MOUD retention of at least 3 continuous months in two family medicine clinics in the western US with integrated behavioral health services.

Methods: Electronic health record data were extracted from adult patients with an OUD diagnosis and ≥1 MOUD order (buprenorphine) and ≥1 visit to either of the two study clinics (rural health center and federally-qualified health center (FQHC)) between 9/1/2014 and

6/27/2018. We examined differences in odds of being retained on MOUD ≥3 months versus <3 months by patient characteristics (age, gender, race/ethnicity, clinic rurality, insurance status, number of medical comorbidities, diagnosis of an anxiety disorder, mood disorder or post-traumatic stress disorder (PTSD), current smoking status).

Results: The sample contained 524 patients with OUD and ≥1 MOUD order. Of those, 65% (n=342) had ≥3 months of MOUD orders. Those with an anxiety disorder diagnosis and PTSD diagnosis had higher odds of being retained for ≥3 months (aOR=1.58, 95% CI=1.03-2.42 and aOR=1.94, 95% CI=1.20-3.44, respectively). Patients treated in the rural health center had lower odds of being retained for ≥3 months compared to those at the urban FQHC (aOR=0.59, 95% CI=0.38-0.91).

Conclusions: MOUD retention did not differ by most patient demographics. Retention did vary by clinic rurality and certain psychiatric conditions, with higher retention among those with an anxiety disorder or PTSD. While future studies are warranted to determine the etiology of these differences, it is possible that engagement with behavioral health services within the primary care setting is associated with increased MOUD retention.

HIV PATIENT PERSPECTIVES ON EXTENDED-RELEASE NALTREXONE INDUCTION FOR OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: The National Drug Abuse Treatment Clinical Trials Network "Comparing Treatments for HIV-Infected Opioid Users in an Integrated Care Effectiveness Study (CHOICES) Scale-up study" (CTN-0067) randomized participants with HIV and OUD to HIV clinic-based extended-release naltrexone (XR-NTX), which requires complete cessation of opioid use, versus treatment-as-usual (e.g., buprenorphine, methadone) (ClinicalTrials.gov: NCT03275350). A preliminary qualitative investigation was conducted to better understand patient perspectives about induction on XR-NTX.

Methods: Semi-structured qualitative interviews were completed with a convenience sample of study participants (n = 36) from six participating HIV clinics between 2018 and 2019 who were randomized to XR-NTX. All participants approached for this qualitative interview agreed to participate. Interviews probed perspectives on XR-NTX induction. Interviews were digitally recorded, professionally transcribed, and analyzed using a thematic analysis approach.

Results: 44% of participants were female; 17% were Hispanic and 61% African American; ages ranged from 27-69. Several themes emerged regarding respondents' experiences and perspectives about induction. Participants who were not inducted (n=17) reported: 1) concern about the detoxification period required prior to induction; 2) feeling unprepared to stop using opioids; 3) misinformation about XR-NTX effects (for example, believing they will overdose if they use heroin while on XR-NTX) and 4) preferences for agonist medications or remaining on agonist therapy following inpatient detoxification using opioid agonists for withdrawal symptoms. Participants who completed induction (n=19) reported 1) a strong desire to discontinue opioid use; 2) a supportive environment during detoxification; 3) a negative

naloxone challenge test immediately before initial XR-NTX injection; and 4) meaningful contact with staff who provided needed encouragement and addressed their concerns.

Conclusions: The results highlight opportunities to improve uptake of XR-NTX in high-needs populations. Assisting participants in finding safe places for non-opioid agonist-based medically-supervised withdrawal and addressing expectations regarding induction may be targets for improving XR-NTX initiation.

THE CHANGING LANDSCAPE OF INJECTABLE OPIOID AGONIST TREATMENT (IOAT) SERVICE DELIVERY IN CANADA: A FOLLOW-UP ENVIRONMENTAL SCAN

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Program Descriptions

Aim: In 2018, one death from opioids occurred every two hours in Canada. Fentanyl contamination of the illicit drug supply remains a major driver of this ongoing epidemic. Injectable opioid agonist treatment (iOAT) is available increasingly across Canada in the form of hydromorphone or diacetylmorphine (i.e. medical heroin). iOAT is an evidence-based option within the opioid use disorder continuum of care for people most at-risk for overdose. This follow-up environmental scan aimed to describe changes in iOAT service delivery in Canada since the September 2018 baseline scan.

Methods: Key informant surveys by telephone and email were used to characterize iOAT programs as of March 2019. Data on location, service delivery model, clinical and operational characteristics, client demographics, and program facilitators and barriers were gathered. Conventional content analysis and descriptive statistics were used to compare follow-up findings to baseline. Three annual follow-up scans will further monitor progress.

Results: At follow-up, two new programs in Alberta and one in Ontario complemented the 9 continuing baseline programs (of an initial 11) in British Columbia and Ontario. Of the four service delivery models identified, integration within existing health and social programs remained most common. Diacetylmorphine was still only available at one program. New barriers reported at follow-up included funding processes, coordination with other services, concurrent stimulant use, and housing. Service delivery improvements included renovations to increase capacity, flexible scheduling, longer hours, faster prescription fills, and additional services (e.g. counselling).

Conclusions: This first longitudinal dataset demonstrates the dynamic state of iOAT provision in Canada. Though increasing, iOAT access remains limited and further scale-up work is required. Key barriers and improvements identified within each service delivery model can guide tailored local implementation to augment iOAT access across Canada. The findings also inform national policy and practice for iOAT expansion as part of the opioid overdose response.

"I'M A SURVIVOR:" A QUALITATIVE STUDY OF THE PERCEPTIONS OF DISEASE IDENTITY AMONG PEOPLE WITH OPIOID USE DISORDER IN SUSTAINED REMISSION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Clinicians and researchers often apply a chronic disease model to substance use disorders. To what extent people with opioid use disorder (OUD) in sustained remission while on medication identify with having a "chronic disease" remains unknown. The purpose of this study was to explore their perceptions of disease identity and acceptance of a survivorship model.
Methods: Patients with OUD receiving opioid agonist therapy who remain illicit opioid free for at least 5 years were recruited to participate in a qualitative study involving individual in-depth interviews. Clinicians identified potential participants who could provide an informed perspective. We used maximized variation sampling to recruit a demographically diverse sample and to ensure variability in medications (buprenorphine vs methadone) and clinical setting (opioid treatment program vs office-based treatment). We analyzed data using a grounded theory approach with constant comparative analysis and inductive coding.
Results: We interviewed 14 participants. Median time since last illicit opioid use was 13.5 years (IQR 8.5 – 18.5). Participants described a complex, occasionally ambiguous, and shifting disease identity. Two typologies of disease identity emerged: first, a chronic disease state where participants describe inherent traits or predetermination (i.e. genes or environment) of developing OUD. Maintaining this disease identity helps them remain vigilant against returning to drug use. Second, a survivorship state where participants describe a post-disease state where OUD is not present, but the experience remains. They live without constant considerations of OUD. This "survivor" identity allows participants to view their life as being the same as people without OUD.
Conclusions: We found participants in long-term remission from OUD had different perceptions of disease identity: themes include a "chronic disease" versus "survivor" identity. Each plays a functional role in preventing return to drug use. A survivorship model of OUD was accepted by some participants and could conflict with the chronic disease model of addiction.

CORRELATES OF SLEEP QUALITY AND EXCESSIVE DAYTIME SLEEPINESS IN PEOPLE WITH OPIOID USE DISORDER RECEIVING METHADONE TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research
Aim: To determine the prevalence and clinical correlates of impaired sleep quality and excessive daytime sleepiness among patients receiving methadone for opioid use disorder (OUD).
Methods: Patients receiving methadone (n = 164) completed surveys assessing sleep quality (Pittsburgh Sleep Quality Index [(PSQI]), daytime sleepiness (Epworth Sleepiness Scale [ESS]), and related comorbidities. Pain and psychiatric correlates were assessed using the Brief Pain Inventory and Brief Symptom Inventory, respectively. We used bivariate and multivariable linear regression models to evaluate correlates of sleep quality and daytime sleepiness.
Results: The sample was young (44 ± 10 years) and majority Caucasian (59%). 41% were female, and 10% had any employment. The mean methadone dose was 80 ± 31 mg, and the median duration of treatment was 24 months (IQR: 8-48 months). 90% of patients reported poor sleep quality (PSQI >5), and the mean PSQI was high (11.0 ± 4). 46% reported excessive daytime sleepiness (ESS 11 ± 7). In multivariable analyses, higher PSQI (worse sleep quality) was significantly associated with pain interference (Coefficient = 0.40; 95% CI = 0.18-0.62; B = 0.31), somatization (Coefficient = 2.2; 95% CI = 0.75-3.6; B = 0.26), and negatively associated with employment (Coefficient = -2.6; 95% CI = -4.9- -0.19; B = -0.17). Greater sleepiness was significantly associated with body mass index (Coefficient = 0.32; 95% CI = 0.18-0.46; B = 0.33), and there was a non-significant association between sleepiness and current chronic pain (Coefficient = 1.6; 95% CI = 0.26-3.5; B = 0.13; p-value = 0.09).
Conclusions: Poor sleep quality and excessive daytime sleepiness are common in patients receiving methadone for OUD. Chronic pain, somatization, employment status, and greater BMI are potentially modifiable risk factors for sleep problems for individuals receiving methadone. People with OUD receiving methadone should be routinely and promptly evaluated and treated for sleep disorders.

PROTECTIVE AND RISK FACTORS FOR ILLICIT OPIOID USE ASSOCIATED WITH PARTICIPATION IN DIFFERENT PROGRAMS IN THE TREATMENT OF OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: To characterize the socio-demographic, medical and psychiatric profile of the opioid patient population receiving medication-assisted treatment at the Addiction Institute at Mount Sinai, New York. To identify protective and risk factors for the treatment outcome determined as abstinence from or use of illicit opioids, respectively, over the past 90 days
Methods: This was a retrospective review of clinical charts and electronic records of patients with opioid use disorder. Three groups of patients were studied — those receiving treatment

with methadone (OTPM, N=61) or buprenorphine (OTPB, N=54) in the Opioid Treatment Program, or receiving Office-based Opioid Treatment with buprenorphine (OBOTB, N=59). Both male (N=116) and female (N=58) patients were included. Illicit drug use was assessed using self-reports and results of toxicology tests. Logistic regression and multivariate analysis were applied.

Results: There were no significant differences between the groups in age, gender, history of illicit drug use, and medical conditions. Sixty-one percent of the OTPM, forty-four percent of OTPB, and five percent of OBOTB groups used illicit opioids in the past 90 days. Protective factors in favor of abstinence from illicit opioids included being in the OBOTB group and a higher level of education. Risk factors for illicit opioid use included suboptimal living conditions, unemployment, history of sexual abuse, diagnosis of post-traumatic stress disorder (PTSD) and schizophrenia, history of injectable drug use, and concomitant use of cocaine or benzodiazepines in the past 90 days. In the final multivariate model, OBOTB remained a protective factor (adjusted OR (95% CI) = 0.073 (0.014, 0.376), whereas risk factors included a history of PTSD (4.611 (1.418, 14.989) and concomitant use of cocaine in the past 90 days (6.662 (1.797, 24.697).

Conclusions: Treatment with buprenorphine in the office-based setting is associated with reduced use of illicit opioids. Comorbid PTSD and concomitant use of cocaine may increase the risk of relapse

ASSESSMENT OF POTENTIAL SOBER SUPPORTS AMONG DUALLY DIAGNOSED INPATIENTS ON AN ACUTE PSYCHIATRIC UNIT

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Abstract Detail: Human
Drug Category: Other, all substances are relevant
Topic: Treatment
Abstract Category: Original Research

Aim: This study evaluates the presence of drug-free family and friends in the social networks of people with co-occurring psychiatric and substance use disorders (SUD), treated in an acute psychiatric inpatient unit. In addition to providing much needed social and recovery support, activation of drug-free social networks holds largely unexplored potential to: 1) improve adherence to outpatient appointments and medication; 2) improve treatment retention; and 3) improve attendance to self-help groups. Each of these behaviors is strongly associated with reduced drug use and improved functioning.

Methods: Social network interviews (Kidorf et al. 2016) were conducted with inpatients on the Johns Hopkins Bayview Acute Psychiatric Unit, with and without SUD. To date, 39 patients (goal 200) have completed the interview (21 with current SUD).

Results: Preliminary results show that patients with SUD report 6.2 people in their network, with 5.1 drug-free members. Those without SUD report a larger network (7.3 people) and more drug-free members (6.8). Overall, drug-free members are most likely to be from the family of origin (92%). Fewer patients with SUD endorse drug-free friends compared to those without SUD (43% vs. 78%). Most patients (87%) are willing to include a drug-free family member or friend in the inpatient treatment plan to support recovery. Almost all patients (92%) identified specific ways that the drug-free network could provide structured assistance in the community (e.g., help attend appointments, taking medications). However, none of these network members had participated in the current treatment episode.

Conclusions: These early results demonstrate that people with co-occurring disorders endorse high rates of underutilized drug-free family and friends, and are willing to include them in treatment to provide structured assistance in the community. These findings support the rationale for future studies that activate drug-free family and friends to both monitor and support behaviors highly associated with abstinence and good mental health.

BRIEF SURVEY ON THE FEASIBILITY OF TAI CHI AMONG OPIOID-USE-DISORDERED PATIENTS RECEIVING OUTPATIENT MEDICATION-ASSISTED TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Alternative Medicine
Abstract Category: Original Research
Aim: This survey investigated the feasibility of conducting a Tai Chi (TC) study in patients with opioid use disorder (OUD) who were receiving outpatient medication-assisted treatment (MAT) with methadone (MTD) or buprenorphine/naltrexone (BUP) at the time of investigation.
Methods: An investigator-designed questionnaire was distributed to OUD patients enrolled in the Center for Addiction Services and Treatment – A MAT clinic at the University of Arkansas for Medical Sciences. The questionnaire included questions regarding demographics, opioid abuse and treatment history, physical health, pain, mental health and interest in joining a TC program.
Results: Ninety-eight patients (41% in the MTD program and 58% in the BUP program) were enrolled. MTD patients tended to have worse physical conditions (e.g., ability to perform vigorous activities: 2.55 ± 1.78 vs. 1.70 ± 1.81, p=0.012) but similar levels of pain (2.40 ± 1.45 vs. 2.32 ± 1.51, p=.689) and mental health (e.g., anxiety level: 2.78 ± 1.27 vs. 2.91 ± 1.56, p=.619) compared to those in the BUP program. MTD patients showed higher levels of interest in TC exercise for improving physical fitness (3.33 ± 1.42 vs. 2.47 ± 1.64, p=.015), easing mental problems (2.88 ± 1.47 vs. 1.98 ± 1.49, p=.005) and easing sleep problems (2.95 ± 1.50 vs. 2.19 ± 1.63, p=.034) relative to BUP patients. Groups showed similar levels of interest in TC for easing pain (3.15 ± 1.58 vs. 2.54 ± 1.64, p=.079), a common problem in OUD patients. However, MTD and BUP patients were similar in reporting at least moderate levels of interest in TC for easing mental problems (53% vs. 32%, p=.063), easing sleep problems (55% vs. 46%, p=.482), easing pain (60% vs. 53%, p=.609) and improving physical fitness (63% vs. 56%, p=.677).
Conclusions: At least 40% of participants surveyed were interested in participating in TC for a health benefit. TC may be an option as a complementary treatment for OUD patients receiving outpatient MAT.

HIV PRE-EXPOSURE PROPHYLAXIS (PREP) ADHERENCE IN PEOPLE WITH OPIOID USE DISORDER ENGAGED IN METHADONE MAINTENANCE TREATMENT: PATIENT-IDENTIFIED FACILITATORS AND BARRIERS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: HIV/Immune
Abstract Category: Original Research
Aim: Needle sharing, risky sexual behavior, and other factors place people with opioid use disorder (PWOUD) at high risk of HIV infection. Pre-exposure prophylaxis (PrEP), a daily oral medication, can reduce risk of HIV infection in PWOUD, yet suboptimal adherence limits PrEP's protective utility. Research to date has not explored the patient-identified determinants of PrEP adherence in PWOUD. Using qualitative methods, we sought to investigate adherence barriers and facilitators in PWOUD engaged in methadone maintenance treatment. We anticipated that structural factors such as healthcare access and social factors such as stigma would serve as barriers, while social support would facilitate adherence.
Methods: Participants were adults who met DSM-5 criteria for OUD and had injected drugs or engaged in condomless sex in the previous six months. This qualitative study was embedded within an ongoing randomized controlled trial in which participants were started on PrEP and were then randomized to either a behavioral HIV prevention intervention or an attention-matched control condition. Semi-structured personal interviews were conducted three months after participants began PrEP. Interviews assessed reasons for initiating PrEP, strategies for maintaining adherence, reasons for continuing or discontinuing PrEP, and desired support resources. Interview transcripts were analyzed using thematic content analysis.
Results: Twelve PWOUD completed personal interviews. Key barriers to continued PrEP use included low perceived HIV risk, confusing or inconvenient medication refill procedures, homelessness, and health concerns associated with long-term PrEP use. Adherence facilitators included text reminders, supportive relationships with peers and research staff, and high perceived risk of opioid relapse. Desired resources included mental health treatment. Notably, several participants indicated intentions to use PrEP intermittently in the event of opioid use relapse.
Conclusions: Pragmatic, cognitive, and motivational barriers impede PrEP adherence in PWOUD. Mental health resources, structural supports, and motivational enhancement may improve adherence and represent targets for future interventions.

STATE SPACE MODELING FOR A SINGLE INDEX SUMMARY OF MULTI-DIMENSIONAL LONGITUDINAL DATA STREAM IN LARGE SCALE CLINICAL TRIALS IN OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research
Aim: Timeline follow-back (TLFB) and Urine drug screen (UDS) are ubiquitous longitudinal individual-level data streams in clinical studies of substance use disorders. Typically, TLFB is recalled subjectively as daily use for several substances, and the UDS is measured on weekly visits. Methodological approaches to characterize and model this complex data type with multiple dimensions, irregular time intervals between observations, and complex patterns of

missing observations, remain underdeveloped. Here we propose a unified framework to summarize the data in a single index over time, which represents the probability of the patient's relapse.

Methods: State space models (SSM) are a class of Bayesian Generative Models for time series. They are unsupervised learning models which assume data are generated from a chain of latent states, and estimates the conditional distribution of observations given the latent state at each time point, as well as the transition probabilities for the latent state given the state of last time point.

Results: The method is applied to data from a single multisite National Drug Abuse Clinical Trials Network study (CTN-051). 570 participants were randomly assigned (1:1) to extended-release naltrexone (XR-NTX) and buprenorphine-naloxone (BUP-NX) for 24 weeks of outpatient treatment. We assume the latent state for each day is a binary variable taking values 0 (abstinent) and 1 (relapse). The observed multi-dimensional data for each day is TLFB opioid, heroin (0=Negative, 1=Positive, 2=Missing), and UDS for opioid (0=Negative, 1=Positive, 2=Missing). We implemented the SSM with categorical observations and latent variables and showed that it can capture patterns of TLFB and UDS simultaneously.

Conclusions: The model captures two major states of patients and provides an intuitive summary of the time varying patterns of patients' state with the posterior probabilities of the addiction state. This model can be generalized to other clinical trials in substance use disorders.

A QUALITATIVE STUDY OF BARRIERS TO TREATMENT RETENTION AMONG PATIENTS RECEIVING BUPRENORPHINE-NALOXONE FOR OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Program Descriptions
Aim: Buprenorphine-naloxone, an opioid agonist-antagonist, is frequently utilized in the Medication-Assisted Treatment (MAT) of opioid use disorder and is an effective treatment for opioid detoxification, harm reduction, and maintenance therapy across inpatient and outpatient settings. Unfortunately, MAT adherence for those with opioid addiction is very low, with more than 50% relapse and dropout in most studies. Relapse and dropout usually occur within the first 5 office visits, when lifestyle changes are at their peak. The goal of this qualitative research was to identify common reasons for seeking treatment, barriers that may exist during treatment initiation, typical causes of treatment failure, and recommendations for improving MAT retention.

Methods: The current study presents emergent survey results from 50 opioid use disorder patients receiving buprenorphine-naloxone who had been in treatment for more than 3 months. Patients were paid $50 for their participation in this anonymous, cross-sectional data collection.

Results: Participants indicated that legal and custody issues were often precipitators of buprenorphine-naloxone treatment-seeking, and lack of social support, lack of financial means, mental health issues, and other substance use were common barriers to remaining in treatment. Causes of buprenorphine-naloxone treatment discontinuation included having a partner or family member who was using illicit opioids, lacking the finances to attend physician visits or

purchase buprenorphine-naloxone, and not being "ready" (lacking motivation and/or problem-solving skills, and inability to withstand cravings). Participants offered their evaluations of methods proposed to improve treatment retention, including contingency management and counseling with motivational enhancement, mindfulness training, and decision-mailing strategies.

Conclusions: Results from this qualitative work suggest that supportive financial, psychological, and social support could significantly improve treatment retention for individuals initiating buprenorphine-naloxone treatment for opioid use disorder.

TWO-YEAR POST-RELEASE OUTCOMES OF US DETAINEES WITH OPIOID USE DISORDER: RESULTS FROM A RANDOMIZED TRIAL OF METHADONE TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: To examine two-year post-release outcomes in terms of drug treatment enrollment status, illicit drug use, and subsequent arrest of participants with opioid use disorder (OUD) enrolled in a study of initiating methadone treatment prior to release from jail.

Methods: Newly-arrested adults with OUD receiving medically-managed opioid withdrawal treatment in the Baltimore City Detention Center were enrolled in the study. Participants were randomly assigned to either: (1) IM [interim methadone treatment without counseling during detention with an assigned community-based methadone maintenance treatment (MMT) program with counseling upon release]; (2) IM+PN [IM plus a patient navigator for 3 months following release]; or, (3) Enhanced Treatment as Usual [ETAU; brief medically-managed opioid withdrawal with methadone, drug education/overdose prevention, and referral to city-wide treatment referral call center]. Outcomes assessed at 24-month follow-up after release from the index detention included treatment enrollment status, illicit opioid use, subsequent arrest, and overdose. Regression analyses controlling for age, gender, prior MMT, and baseline cocaine use will be used to examine participant outcomes.

Results: There were 225 participants. Participants had a mean (SD) age of 38.5 (10.0), 81% were male, 64% were African American. Through the 12-month follow-up, there were no significant differences among the groups in terms of treatment enrollment, illicit opioid use, or arrest. Thus far, 80% (n=159) of the 24-month follow-up interviews that were due have been completed. None of the nine overdose deaths occurred during methadone treatment. Final 24-month follow-up results based on the 12-month outcome measures mentioned above will be presented.

Conclusions: There is a paucity of data in the US on long-term outcomes of released pre-trial detainees with opioid use disorder. These 24-month follow-up data can be used to understand longitudinal outcomes of arrestees with OUD to inform future treatment and research efforts.

EMERGENCY DEPARTMENT LONGITUDINAL INTEGRATED CARE (ED-LINC): A FEASIBILITY PILOT TRIAL FOR PATIENTS IN THE EMERGENCY DEPARTMENT WITH RISK FOR OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: The 'Emergency Department Longitudinal Integrated Care' (ED-LINC) intervention is a multi-component intervention derived from the collaborative care model for patients with Opioid Use Disorder (OUD) which is initiated in the Emergency Department (ED) and extends longitudinally to improve treatment initiation/retention in outpatient services. The aim of this study is to determine the feasibility of recruitment and retention procedures for ED-LINC, and document the baseline characteristics of study participants
Methods: Potential eligible participants were screened by RAs in the Harborview Medical Center ED from 11/2018 to 6/2019. Eligible participants were at risk for OUD based on NM-ASSIST ≥4 for illicit opioids (e.g. heroin) or prescription opioid misuse, had a phone, spoke English, and were likely to be discharged from the ED. Participants were excluded if they required active resuscitation, were in police custody, had a primary psychiatric emergency, or on chronic opioid treatment. Participants were asked to complete baseline, 1, 3, and 6-month validated surveys.
Results: 496 patients were screened, 118 (23.8%) had an NM-ASSIST ≥4 for opioid use, 75 were found to be ineligible (57% no method of contact, 15% altered mental status, 5% refused), and 43 were eligible. Of those, 40 (93%) were enrolled (average age 37.4 years, 45% female, 62% white, 50% unstable housing). Polysubstance use was high with 68% endorsing past 3-month methamphetamine use, 38% with problem alcohol use, and 35% with past-year opioid overdose. Additionally 68% had major depression and 73% met criteria for generalized anxiety disorder. Follow-up rates were 85% at both 1 and 3 months with 6-month data collection on-going.
Conclusions: Recruitment procedures for ED-LINC were feasible and retention for follow-up interviews was high. Due to high levels of substance use and mental health comorbidity, ED-LINC shows promise as a healthcare delivery intervention for patients with OUD and complex comorbidity. Future work in this area is needed.

OPEN-LABEL PILOT STUDY OF EXTENDED-RELEASE BUPRENORPHINE FOR THE TREATMENT OF HEROIN-USING OPIOID USE DISORDER OUTPATIENTS POSITIVE FOR HIGHLY POTENT SYNTHETIC OPIOIDS

John Mariani*[1], *Amy Mahony*[2], *Daniel Brooks*[2], *Christina Brezing*[1], *Sean Luo*[1], *Nasir Naqvi*[1], *Samuel Podell*[2], *Frances Levin*[1]

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Abstract Detail: Human
Drug Category: Opiates/Opioids

Topic: Treatment

Abstract Category: Original Research

Aim: To test the safety and feasibility of using extended-release buprenorphine (BXR) for injection as a treatment for heroin using opioid use disorder (OUD) outpatients who test positive for highly potent synthetic opioids (HPSO).

Methods: In a 12-week open-label, uncontrolled clinical trial, the feasibility of using three monthly injections of BXR (300 mg-300 mg-100 mg) for the treatment of heroin-using OUD testing positive for HPSO was tested in 10 male and female outpatients. The project was conducted in two phases, with the first five participants receiving the first BXR injection 2-3 days after initiating a sublingual buprenorphine (BSL) induction, and the next five participants receiving the first BXR injection on the first day of the induction.

Results: All 10 participants who initiated the BSL induction received BXR; one additional participant signed consent, but did not initiate the BSL induction. For the first five participants, two participants received the injection on the second day of SL buprenorphine induction (up to 24 mg daily) and three participants received it on day three. In the first group of five participants 4 participants received all three planned injections and one participant received only the first injection. For the second group of five participants, all received the first BXR injection after receiving BSL 24 mg on the first day of the buprenorphine induction. In the second group of five participants, all participants received all three planned injections. There were no serious adverse events.

Conclusions: The use of BXR for the treatment of heroin-using outpatients with OUD who are positive for HPSO appears to be feasible and deserving for further study. BXR can be administered in this population on the first day of the BSL induction achieving rapid clinical stability for the patient.

ADJUNCTIVE EXERCISE INTERVENTIONS FOR OPIOID USE DISORDER: A REVIEW

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Abstract Detail: Human

Drug Category: Opiates/Opioids

Topic: Treatment

Abstract Category: Literature Review

Aim: Opioid maintenance therapy (OMT) is the standard care for treatment of opioid use disorder, but some individuals on OMT experience disrupted sleep, heightened sensitivity to pain, and continued relapse to harmful opioid abuse. An adjunctive treatment that has potential to address these shortcomings of OMT is aerobic exercise. The aim of the present review was to identify and evaluate components of aerobic exercise interventions targeting OMT patients.

Methods: Studies were retrieved from four electronic bibliographic databases, a database of funded research (NIH RePORTER), ClinicalTrials.gov, and reference sections of relevant manuscripts published through December 2018. Studies that (a) evaluated an aerobic exercise intervention, (b) included a comparison condition or pretest-posttest measures, and (c) sampled adult patients currently enrolled in an OMT were included. Two independent coders extracted data from full text articles (96% agreement).

Results: The search yielded 2,971 unique records, from which 3 primary studies and 1 supplemental manuscript comprised the final sample. All studies were randomized trials with small samples of middle-aged OMT patients. Exercise interventions were conducted in a

supervised setting and included a variety of non-aerobic activities (e.g., stretching) in addition to aerobic exercise. No studies included a controlled dose of aerobic exercise. Intervention adherence was challenging to maintain, though appeared important for the impact of the activity. Limited measures of objective physical activity or cardiorespiratory fitness were included. There were no significant effects of adjunctive exercise on substance use outcomes relative to controls, but these tests were likely underpowered.

Conclusions: Though early in the accumulation of evidence, interventions targeting aerobic exercise for OMT patients appear to be feasible, acceptable to patients, and beneficial. Longer-term studies that employ larger samples, include assessments of behavioral and biological mechanisms of change, more rigorous measurement of physical activity, and controlled doses of aerobic activity are warranted.

INTERIM BUPRENORPHINE TREATMENT: PRELIMINARY OUTCOMES OVER A LONGER DURATION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: Despite demonstrated efficacy of opioid agonist treatment for individuals with OUD, many geographic regions experience insufficient treatment availability, particularly in rural areas. We previously demonstrated the initial efficacy of a 12-week technology-assisted interim buprenorphine treatment (IBT) for reducing illicit opioid use, IV use and other risks during treatment waitlist delays. In two ongoing randomized trials, we are seeking to replicate and extend those initial findings with a larger sample, over a longer duration and with individuals residing in rural regions.

Methods: 67 adults with OUD have been randomized to 24-week IBT (n=34) or control (n=33) conditions. Participants are on average 39 years old, 45% female, and 46% reside in medically-underserved counties. Following stabilization, IBT participants visit the clinic twice monthly to ingest buprenorphine and provide a staff-monitored urine specimen. Remaining doses are provided through a computerized dispenser that permits buprenorphine administration at home. IBT participants receive system-generated random call backs and daily calls assessing drug use, craving and withdrawal via an interactive voice-response system. Both groups are offered community resources, intranasal naloxone, assistance with contacting local treatment providers, and complete monthly follow-ups.

Results: IBT participants are achieving greater illicit opioid abstinence, with 88%, 90%, 82%, 86%, 82% and 81% of IBT participants providing illicit opioid-negative specimens at Study Weeks 4, 8, 12, 16, 20 and 24 vs. 6%, 30%, 30%, 37%, 42% and 40% of controls. IBT participants' adherence to daily monitoring calls (94%) and random callbacks (89%) are high. Additional outcomes related to the opioid overdose and infectious disease education components of the IBT intervention will be available for the June 2020 meeting.

Conclusions: Preliminary data from these ongoing randomized trials suggest IBT efficacy over longer durations and among individuals in geographically isolated and underserved areas. Comprehensive analyses of primary and secondary outcomes will be available in June.

BUPRENORPHINE: PHARMACY-RELATED BARRIERS AND MOTIVATIONS FOR ILLICIT USE

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: While buprenorphine has been used as an effective treatment for opioid use disorder for nearly 20 years, significant barriers to access still exist. The overall objective of this study is to determine whether patients prescribed buprenorphine encounter pharmacy-related barriers and if such barriers are associated with illicit buprenorphine use.

Methods: A cross-sectional self-reported survey was administered to a convenience sample of treatment-seeking patients. Participants were eligible to complete the survey if they had received at least 3 buprenorphine prescriptions in the past 12 months. The survey instrument consisted of 33 items and took approximately 5 to 15 minutes to complete. The survey collected data on demographic characteristics, problems filling buprenorphine prescriptions and motivations for non-medical use of buprenorphine.

Results: Preliminary survey results (n=41) found that 39.5% of respondents stated that they had experienced at least one problem when trying to fill their buprenorphine prescription within the past year and 18.6% reported having to go without their buprenorphine due to problems with dispensing their prescription. Problems respondents encountered when attempting to fill their prescription included the pharmacy needing to order supplies of buprenorphine (n=6) and insurance-related problems (n=4). Three respondents reported that the pharmacy refused to fill their prescription and two were told that the pharmacy did not stock buprenorphine. Almost half (48.8%) reported illicit buprenorphine use in the past 12 months. The most commonly endorsed motivations for illicit use were to prevent/reduce cravings (n=15), ease withdrawal (n=14), and to maintain abstinence from other drugs (n=10). Respondents who reported problems filling their prescriptions were more likely to report illicit buprenorphine use (68.8% vs 36.0%, p=0.041).

Conclusions: Many patients experienced pharmacy-related problems when attempting to fill buprenorphine prescriptions. Additional research is needed to prospectively assess whether pharmacy-related barriers increase the risk of illicit buprenorphine use.

IMMUNE ACTIVATION IN HIV-INFECTED ART-SUPPRESSED OPIATE USE DISORDER INDIVIDUALS RECEIVING MOUD: ROLE OF MU-OPIOID RECEPTOR ACTIVATION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: HIV/Immune

Abstract Category: Original Research

Aim: Immune activation is correlated with higher mortality in HIV-infected individuals. Chronic opiate use increased systemic immune activation. The objective is to evaluate if a sustained interaction with the mu-opioid receptor (MOR) while on antiretroviral therapy (ART) and methadone treatment might alter the immune reconstitution.

Methods: We assessed the expression of immune activation markers and soluble microbial translocation markers in a cross-sectional convenience cohort of HIV-infected opioid use disorders individuals receiving ART and MOUD (methadone MET, extended-release naltrexone RXR-NTX) and a control group (non-drug users, ART-suppressed).

Results: The sample consisted in 26 HIV-infected individuals (MET=10, XR-NTX=6, Control=10). Age, race and gender distribution, current and nadir CD4 count and time on ART were similar in all three groups. sCD14 was significantly higher in the MET than in both XR-NTX (p= 0. 0262) and control groups (p= 0. 0058; Kruskal Wallis ANOVA: p= 0. 0091), and there are no difference XR-NTX and control group, suggesting that protracted engagement of MOR is associated with higher microbial translocation/myeloid activation. Higher CD4 T-cell HIV GAG RNA expression (ddPCR) in the MET group was also detected. A mixed-effect model to assess the effect of MET vs. XR-NTX, ART duration, and MOUD duration on T-cell activation (% of CD38+/HLA-DR+ CD8+ T cells) and sCD14 showed that markers of immune activation and microbial translocation were more elevated in MET than XR-NTX. There were correlations between % of CD38+/HLA-DR+ CD8+ T cells and sCD14 (Rho=0.4, p=0.02) and the CD4 rise from pre-ART levels (Rho=-0.5, p=0.006).

Conclusions: Within the limitations of a small convenience cohort, these findings support the hypothesis that continued MOR engagement may result in impaired immune reconstitution outcomes.

GENDER DIFFERENCES IN BIOPSYCHOSOCIAL CHARACTERISTICS OF AN URBAN OPIOID USE DISORDER OUTPATIENT BUPRENORPHINE TREATMENT POPULATION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Sex Differences
Abstract Category: Original Research

Aim: The gender makeup of individuals seeking opioid use disorder (OUD) treatment is changing. OUD treatment outcome differences by gender may vary by pharmacotherapy, particularly for buprenorphine. Treatment programs are increasingly utilizing buprenorphine and need a better understanding of how gender modifies the clinical course. This study describes gender differences in biopsychosocial characteristics and correlates of buprenorphine non-adherence in an OUD treatment population.

Methods: Subjects were recruited from an urban, comprehensive, outpatient, substance use clinic to complete a voluntary, electronic, cross-sectional survey from July-September 2019. Surveys assessed sociodemographic, mental health, violence, and HIV risk factors. Participants included were on buprenorphine for OUD. The Prescription Monitoring Program was reviewed for buprenorphine non-adherence, operationalized as >5% of days lapsed in buprenorphine receipt (within past 12 months). Gender differences were calculated using Chi square and Fisher's Exact Tests for categorical variables; T-Tests and Mann Whitney U for continuous

variables. Gender-stratified logistic regression controlling for length of time in treatment identified factors associated with buprenorphine non-adherence.

Results: Overall, 64 men and 76 women were included. Most were Black (68.7%). Mean days in treatment was 410±207 for men and 436±199 for women. Buprenorphine non-adherence did not differ by gender. Compared to men, women were significantly younger (men 46.9, women 40.2 years) and more likely to be unemployed, bisexual, and living alone with children. More women than men endorsed a psychiatric comorbidity history. Men reported more prior addiction treatment episodes than women. For men, living in an unsafe neighborhood was associated with buprenorphine non-adherence (p=.037). None of the other variables assessed, including age, unemployment, mental health comorbidity or chronic pain, were associated with buprenorphine non-adherence for men or women.

Conclusions: Among OUD patients, women experience more biopsychosocial vulnerabilities than men. However, once retained in comprehensive outpatient treatment with buprenorphine, men and women demonstrate similar pharmacotherapy adherence.

IMPACT OF MEDICATIONS FOR OPIOID USE DISORDER ON DISCHARGE AGAINST MEDICAL ADVICE AMONG PEOPLE WHO INJECT DRUGS HOSPITALIZED FOR INFECTIVE ENDOCARDITIS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: People who inject drugs (PWID) are hospitalized for infective endocarditis but are discharged against medical advice (AMA) frequently. AMA discharges are associated with poor outcomes. The impact of medications for opioid use disorder (MOUD) on AMA discharges is unknown. Thus, a retrospective study was performed to examine the impact of MOUD on discharge AMA among hospitalized PWID with infective endocarditis.

Methods: A retrospective review of all PWID hospitalized for endocarditis at our institution between 2016 to 2018 (n=84). We excluded individuals who were not admitted for infective endocarditis, as well as individuals without any recent history of injection drug use.

Results: Overall, 34 individuals (40.5%) were actively engaged in MOUD treatment at the time of admission. The specific MOUD used were buprenorphine (44.1%), methadone (50.0%), and extended-release naltrexone (5.9%). Individuals engaged in MOUD at the time of admission were significantly less likely to be discharged AMA (5.9% vs 24.0%, OR 0.20, 95%CI 0.041 to 0.95, p=0.029). Of the 50 individuals who were out-of-treatment, 21 (43.4%) successfully initiated MOUD during the hospitalization. Buprenorphine was most common (76.2%) followed by methadone (23.8%). However, newly initiating MOUD did not lead to significantly fewer AMA discharges (23.8% vs 24.1%, OR 0.98, 95%CI 0.26 to 3.7, p=0.98). In adjusted analysis, the odds ratio of discharge AMA for those on MOUD at admission was 0.22 (95%CI 0.033 to 1.41, p=0.11), while significant predictors included diagnosis of PTSD (OR 8.5, 95%CI 1.6 to 44.1, p=0.011) and history of prior discharge AMA (OR 10.9, 95%CI 1.3 to 95.2, p=0.030).

Conclusions: PWID admitted for infective endocarditis experience frequent discharge AMAs. Initiation of MOUD alone may not be sufficient to improve outcomes. Those with a prior history of discharge AMA as well as a diagnosis of PTSD may be particularly vulnerable.

DETECTION OF RISKY ALCOHOL USE IN OPIOID TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: Risky alcohol use is underdetected in opioid treatment despite the potential for significant medical consequences, including liver impairment and increased risk for overdose. The aim of this project was to compare four methods of testing for risky alcohol use in an opioid treatment program, with the intention to identify the most accurate.
Methods: Patients in an opioid treatment program (N = 212) were assessed using four methods. Urine samples were analyzed with enzyme immunoassay for ethanol (20 mg/dL cutoff) and ethyl-glucuronide (EtG; 500 ng/mL cutoff). In addition, blood alcohol level was tested with a breathalyzer and self-reported alcohol use was assessed with the full Alcohol Use Disorders Identification Test (AUDIT). Four patients were taking buprenorphine products (2%); the remaining patients were taking methadone. About half of the sample were women (46%). Within-subject agreement between the different assessment methods was examined with Cohen's Kappa. Sensitivity and specificity of each test against the EtG result was also examined.
Results: Overall, 2% (n = 4) of patients were ethanol-positive and 15% (n = 32) were EtG-positive. Two patients (1%) provided a positive breathalyzer and 5% (n =11) met gender-adjusted cutoffs for risky drinking on the AUDIT (8 for men and 6 for women). Kappas ranged from a high of .32 (EtG vs. AUDIT risky drinking) to .10 (EtG vs. breathalyzer). Notably, two of four ethanol-positive patients were EtG-negative, suggesting false positive results. Sensitivity was low (25%) for AUDIT risky drinking when measured against EtG-positive; specificity was 98%.
Conclusions: In this clinical sample, urinalysis for EtG seems to be most helpful to indicate problematic drinking, followed distantly by AUDIT assessment. The accuracy coupled with greater ease of administration suggests that EtG could be routinely included in clinical urine testing to detect risky drinking.

REACH AND IMPLEMENTATION OF NALOXONE TRAINING & OPIOID EDUCATION ON A COLLEGE CAMPUS IN NEW YORK CITY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Prevention

Abstract Category: Program Descriptions

Aim: Nearly three-fourths of drug overdose deaths among those under age 25 are opioid related (CDC, 2016). Research suggests that college students are susceptible to opioid misperceptions and misuse, yet college campuses are an understudied setting for opioid education and naloxone training. Informed by frameworks in implementation science, this study investigates the development, feasibility, adoption, and implementation of an evidence-based opioid education and naloxone training program at a large university in New York City.

Methods: We conducted 10 focus groups with 67 participants who were identified as key stakeholders given their proximity to opioid use or leadership positions on campus. These groups included Greek life, veterans, athletes, students in recovery, Resident Advisors, and health services staff. Based on their recommendations and analysis of key barriers and facilitators to naloxone training/opioid education on campus (e.g. addressing stigma; legal repercussion concerns), we adapted the NY State Department of Health's opioid overdose prevention program requirements and are tracking its reach and implementation across campus. In the first three months of implementation, there was high demand for and attendance at naloxone trainings.

Results: Of the 808 students and staff who registered, 661 students and staff (82%) attended the naloxone training session (n=582 students; n=79 staff). Among attendees, 98% (n=652) picked up naloxone kits. Despite high interest and large numbers trained, the successes we have experienced are not without challenges in fully reaching all key interest populations. For example, while over 80 fraternity/sorority members (attendance typically 32-68% of invited members) and over half of Residential Advisors (57%; n=84) were trained, there has been lower representation among athletes and veterans.

Conclusions: We report on characteristics of participants and non-participants in the program, as well as baseline and 6-month follow-up survey data on knowledge, attitudes, and norms towards naloxone and opioid use, as well as broader substance use issues on campus.

Perinatal

SAFETY AND TOLERABILITY OF HORMONAL CONTRACEPTION AMONG WOMEN RECEIVING MEDICATION TREATMENT FOR OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Other
Abstract Category: Original Research

Aim: Approximately 50% of women receiving medication treatment for opioid use disorder (i.e. methadone or buprenorphine; mOUD) at risk of unintended pregnancy report current contraceptive use compared to 90% in the general population. Citing potential provider concerns about the safety of hormonal contraception among women with OUD, a recent systematic review could not find any articles with data addressing this issue (Ti et al., 2019). We conducted a secondary analysis of adverse event (AE) data from a randomized clinical trial aimed at improving contraceptive use among women receiving mOUD and at risk for

unintended pregnancy to evaluate the safety and tolerability of hormonal contraception in this population.

Methods: During the 6-month intervention, 90 participants randomly assigned to two of the three trial conditions could elect to initiate contraceptive pills, patch, ring, injectables, implant, or IUD during any of 14 scheduled clinic visits. Participants who initiated a method (n=70) were prompted to report any AEs during subsequent clinic visits; medical staff classified AEs as outlined by the Code of Federal Regulations (CFR).

Results: Hormonal contraceptive users (average (SE) duration of use = 137.8(6.3) days) reported four serious AEs (SAEs), none of which were classified as an adverse drug reaction (i.e. related to hormonal contraception; ADR). Of the 594 AEs reported, 325 (55%) were classified as ADRs; by far the most common were changes in bleeding patterns (47%) followed by far fewer reports of headaches/migraines (9%), abdominal/pelvic pain (9%), and implant site problems (8%). Eight women (11%) switched methods due to ADRs, but only 2 (3%), stopped using a method after switching.

Conclusions: These results suggest that hormonal contraception is safe for and well tolerated by women receiving mOUD. All of the ADRs reported were expected and very consistent with experiences reported by women using hormonal contraception in the general population.

SUBSTANCE USE FACILITIES TREATING PREGNANT AND POSTPARTUM WOMEN AND NEONATAL ABSTINENCE SYNDROME IN U.S.: A COUNTY-LEVEL ANALYSIS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research
Aim: To determine the geographic distribution of facilities that provide specialized substance use treatment to pregnant/postpartum women and characterize areas with low capacity to deliver specialized care. To test the county-level association between pregnancy-related treatment capacity and neonatal abstinence syndrome (NAS) rates from 2014 to 2019.

Methods: Data were drawn from three sources: geocoded facility data from the Substance Abuse and Mental Health Services Agency (SAMSHA) treatment locator website [2019, n=14,000], county-level NAS rates/1,000 births from 20 state health department published reports [2014-2019, n=1,472], and county socio-demographic Census estimates [2018, n=3,140]. Poisson regression was used to identify predictors of pregnancy-related treatment capacity, including specialized programs/100,000 population that: (1) provide tailored care to pregnant/postpartum women, (2) prescribe methadone or (3) buprenorphine, and (4) accept Medicaid. We then tested associations between each treatment capacity measure and NAS rates using multivariable Poisson models with state fixed effects and cluster-robust errors.

Results: Among all SAMSHA-listed treatment programs, 2.44% reported providing programs tailored to pregnant/postpartum women. The median pregnancy-related treatment capacity rate per county was 0.32 programs/100,000 population. For buprenorphine, methadone, and Medicaid-accepting facilities, rates were 0.29/100,000, 0.3/100,000 and 0.29/100,000, respectively. Predictors of all four treatment capacity measures included: rurality, low educational attainment, low primary care provider-to-population ratios, high uninsured rates, and low median income. More than a third of counties had NAS rates $\geq$10/1,000 births (34.4%;

n=1080; median: 5.8/1,000). Higher pregnancy-related treatment capacity was significantly associated with lower NAS rates (relative risk [RR]: 0.75, 95% confidence interval [95% CI]: 0.62-0.91; p<0.001), controlling for covariates. Greater buprenorphine capacity [RR: 0.56, 95% CI: 0.45-0.71; p<0.001], methadone capacity [RR: 0.58, 95% CI: 0.47-0.74; p<0.001] and Medicaid capacity [RR: 0.77, 95% CI: 0.68-0.86; p<0.001] were further associated with reduced NAS.

Conclusions: Across 20 states, greater numbers of facilities providing specialized pregnancy-related substance use treatment predicted lower NAS rates at the county-level.

SOCIODEMOGRAPHIC, BEHAVIORAL, AND PSYCHOSOCIAL CORRELATES OF SMOKING DURING PREGNANCY

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Perinatal
Abstract Category: Original Research

Aim: Background: Various demographic and smoking characteristics are well-established predictors of women attempting to quit smoking upon learning of pregnancy. Associations between measures of executive functioning (EF) and pregnancy-related quit attempts have been less widely studied; however, examining this question may reveal important avenues for smoking

cessation interventions targeting pregnant women. The present study examined whether measures of EF are predicted quit attempts upon learning of pregnancy after controlling for conventional demographic and smoking history variables.

Methods: Participants in this study were 261 pregnant women who completed an intake assessment to determine their eligibility for a smoking cessation trial. Associations were examined between sociodemographic data, smoking characteristics, EF measures, and self-reported quit attempts since learning of pregnancy, a proxy for late-pregnancy smoking abstinence.

Results: Relative to women reporting no pregnancy-related quit attempts, women who attempted to quit smoking since learning of pregnancy were younger, more educated, lighter smokers, started smoking at a younger age, reported smoking more quickly upon waking, and exhibited higher EF based on the cigarette purchase task and time perspective-smoking scales (ps < 0.05). However, stepwise logistic regressions indicated that only three variables remained significant predictors of quit attempts in the final adjusted model: younger age, smoking more quickly upon waking, and higher educational attainment (ps < 0.05).

Conclusions: Although EF measures are associated with pregnancy-related quit attempts, efforts to intervene on these variables may have limited impact as sociodemographic and smoking history variables appear to account for a majority of the variance in predicting antepartum quit attempts.

PROTECTIVE FACTORS AND TREATMENT OUTCOMES IN PREGNANT WOMEN IN METHADONE TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Perinatal
Abstract Category: Original Research
Aim: This preliminary study examined the potential relationships between self-reported protective factors and treatment outcomes in pregnant women in methadone treatment. Protective factors included two emotion regulation strategies, self-reported treatment expectancies, confidence in ability to succeed in treatment, and maternal adaptation. The relationships among protective factors, duration of treatment, and UDS results were examined.
Methods: Participants (N=29) completed questionnaires at baseline. Bivariate correlations were used to examine relationships between protective factors. T-tests and correlations were used as appropriate to examine relationships between protective factors, fentanyl use during pregnancy (based on UDS results taken weekly), and duration of treatment.
Results: The tendency to use a greater number of cognitive reappraisal strategies was associated with more positive treatment expectancies ($r = .45$, $p = .02$), greater maternal adaptation ($r = .39$, $p = .036$), and greater confidence in ability to succeed in treatment and at motherhood ($r = .37$, $p = .048$). In contrast, the tendency to use emotion suppression strategies was not related to treatment expectancies, maternal adaptation, or confidence in treatment success and motherhood ($ps > .340$). Trait reappraisal ($t(27) = 2.74$, $p = .011$) and more positive treatment expectancies ($t(27) = 2.16$, $p = .040$) were associated with lower likelihood of testing positive for fentanyl during pregnancy. No protective factors were associated with treatment duration.
Conclusions: Cognitive reappraisal was associated with numerous positive outcomes for pregnant women in methadone treatment, including more positive treatment expectancies and lower likelihood of fentanyl use. Positive treatment expectancies were associated with lower likelihood of testing positive for fentanyl during pregnancy. Teaching cognitive reappraisal skills may be a relevant treatment target for pregnant women in methadone treatment. Examining the effects of specific protective factors among pregnant women in methadone treatment may be a relevant direction for future work.

A PRELIMINARY EXAMINATION OF SIMULATED AND SELF-REPORTED DRIVING BEHAVIORS AMONG YOUNG ADULTS WITH AND WITHOUT PRENATAL COCAINE EXPOSURE

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Behavior
Abstract Category: Original Research
Aim: Prenatal cocaine exposure (PCE) may heighten neurodevelopmental vulnerability to risky driving due to alterations in neurocognitive processes, such as inhibitory control. This exploratory study examined differences in simulated and self-reported driving among young adults with and without PCE.

Methods: Young adult drivers with PCE (n=6) and without (n=5) were recruited from an ongoing longitudinal birth cohort study assessing effects of PCE on development (Mean age=23.2; 27% female). Participants completed a high-fidelity driving simulation scenario that yielded indicators of driving performance shown in previous research to correlate with inhibitory control (average speed, standard deviation of lane position (SDLP)). Inhibitory control was measured via a Stop Signal Task. Risky driving was self-reported through the Checkpoints Risky Driving Scale (C-RDS). Linear regression models tested associations between simulated driving measures (Model 1) and C-RDS scores (Model 2) with PCE status and inhibitory control, controlling for sex and years of driving licensure.

Results: Youth with PCE had higher average drive speeds than youth without PCE (65.2 mph [SD 6.0] vs. 57.2 mph [SD 2.6], t (9) = 2.7, p =0.02), but did not differ in SDLP, C-RDS scores, or stop signal reaction time (SSRT). Controlling for sex and years of licensure, PCE status, but not SSRT, was associated with average speed during simulation (B=7.9, SE = 2.3, 95% CI [3.3-12.4], p=0.001). SSRT, but not PCE status, was associated with C-RDS scores (B=0.06, SE = 0.03, 95% CI [0.006-0.113], p=0.03).

Conclusions: This study is one of the first to document driving behavior during high-fidelity simulation among young adults with PCE. Group differences in speeding, but not inhibitory control, are evident. Inhibitory control is associated with self-reported risky driving in this sample. Further research is needed to explore mechanisms that underlie these group differences in driving and their real-world implications for driver safety.

PERCEPTIONS OF CONTRACEPTIVE AUTONOMY AND COERCION IN THE SETTING OF FINANCIAL INCENTIVES FOR WOMEN WITH OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: In an effort to reduce high rates of unintended pregnancy among women receiving medication for opioid use disorder, our team developed an intervention to increase contraceptive use that combines the World Health Organization's (WHO) contraception protocol with financial incentives for attendance at follow-up visits. In addition to studying intervention effectiveness, it is important to also examine whether participants' contraception use is in accordance with their preferences given concerns about reproductive autonomy and reports of contraception coercion in this vulnerable population.

Methods: Women (N=138) were randomly assigned to three study conditions: usual care, WHO contraception protocol (WHO) or WHO contraception protocol + financial incentives for follow-up attendance (WHO+V). At the end of study, a subset of women in the two intervention conditions (n=25 and 18, respectively) completed a structured interview administered by someone outside the research team or self-administered on paper. Women were asked open-ended questions about their contraception choices during the study, whether they felt pressured, and if they felt their opinions about contraception were heard by study staff. Responses were coded as positive or negative.

Results: Nearly all women in both conditions felt they received the information needed to make the best decision (96% and 100%, respectively) and felt their opinions about contraception were taken seriously (92% and 94%). Most (68% and 83%) chose to receive a contraceptive method from study staff and all felt they could get the contraception method of their choice. A few women in each condition (12% and 17%) reported feeling pressured to make a certain decision about contraception, but elaborated they felt "able to say no" or their concerns about feeling pressured were "dealt with respectfully."

Conclusions: Overall, women in both conditions reported positive experiences and the use of financial incentives did not appear to decrease autonomy or increase feelings of coercion among women who received them.

GREATER OXYCODONE SELF-ADMINISTRATION BY MALE ADULT C57BL/6J MICE THAT HAD EXPOSED TO OXYCODONE DURING PRENATAL AND EARLY POSTNATAL PERIODS

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Abstract Detail: Animal Study
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: Abuse of opioids is a major public health issue. Many women are taking opioid at some point during pregnancy. Prenatal opioid exposure can induce neonatal abstinence syndrome in newborn infants. There is limited information about its long-term effects. We therefore developed a mouse model that simulated a prescription opioid oxycodone-dependent female who became pregnant.

Methods: Adult female and male C57BL/CJ mice (12 weeks old) were injected with ascending doses of short-acting opioid oxycodone once a day (1 mg/kg x10 days, 1.5 mg/kg x10 days, 2 mg/kg x10 days, s.c.) whereas control mice were injected with saline once a day for 30 days. The female and male mice injected with oxycodone were then housed together and continued to receive ascending doses of oxycodone injections (3 mg/kg x10 days, 4 mg/kg x10 days, 5 mg/kg x 10 days, 6 mg/kg x10 days, s.c.) during pregnancy and nursing. The final dose of 6 mg/kg/day was maintained until the offspring were weaned. Control male and female mice were housed together and injected with saline until the offspring were weaned. Subsequently, the adult male offspring of these mice were examined in a 10-day oxycodone self-administration (SA) paradigm (4 hours/session for 10 days, FR1).

Results: The male offspring of mice injected with oxycodone showed higher SA of oxycodone from day 1 to 7. The male offspring of control mice took smaller amount of oxycodone initially. However, both groups took similar amount of oxycodone after 7 days of oxycodone SA.

Conclusions: These are the first studies examining oxycodone SA behavior in mice exposed to oxycodone during prenatal and postnatal periods. The results of this study suggest that prenatal and early postnatal exposure to oxycodone led to neuronal adaption which enhanced oxycodone self-administration.

MATERNAL SUBSTANCE USE AND DIAGNOSED ABUSIVE HEAD TRAUMA: A POPULATION-BASED STUDY IN TAIWAN

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: Early-life exposure to parental substance use may exert negative effects on one's health and wellbeing. With a focus on the first year of life, the present study examines the association linking maternal substance involvement with child maltreatment and abusive head trauma－the leading cause for maltreatment fatalities.

Methods: We conducted a population-based retrospective cohort study comprising 2.2 million infants enrolled in Taiwan's National Health Insurance Plan from 2004 to 2014, following up from birth to the first birthday. Hospitalization or emergency room visits due to probable child maltreatment were identified by the International Classification of Diseases, Ninth Revision, Clinical Modification "child maltreatment syndrome, ICD-CM 995.5". "Abusive head trauma [AHT]" was ascertained by ICD-CM 995.55 with confirmation by magnetic resonance imaging or computerized tomography. The risk associations were estimated by the Generalized Linear Models.

Results: The incidence rates of diagnosed child maltreatment in infancy fell between 2.1 and 3.3 per 10,000 during the study period, and the corresponding estimates were 1.0~1.7 per 10,000 for AHT. Crude analyses indicated that children's characteristics (e.g., low birth weight), disadvantaged family background (e.g., family poverty and lower maternal educational attainment), and unfavorable maternal health condition (e.g., maternal depression and substance use) were all associated with increased risk of maltreatment and AHT. With simultaneous adjustment for all confounders, maternal depression was the strongest predictor for maltreatment (Adjusted Incidence Relative Ratio [aIRR]= 2.03; 95% CI=1.00-4.09), whereas for AHT maternal substance use was more salient (aIRR=2.79 95% CI=1.01-7.68).

Conclusions: Our results highlight the importance of recognizing the critical window in delivering effective interventions to the newborns born to mothers with mental health or substance use problems (e.g., home visitation services).

BREASTFEEDING AND MARIJUANA USE: RECOMMENDATIONS FROM THE FIELD POST MARIJUANA LEGALIZATION IN VERMONT

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Other
Abstract Category: Original Research

Aim: Breastfeeding is associated with many health benefits for the mother and child but there is very limited scientific research regarding the effects of marijuana use during breastfeeding. A recent study surveyed lactation professionals attending a 2014 lactation conference in

Vermont on their recommendations regarding breastfeeding and marijuana use (Bergeria & Heil, 2015). At the time, only medical marijuana was legal in the state. Lactation professionals surveyed estimated that 15% of the breastfeeding women they worked with were also marijuana users. The majority of lactation professionals reported making recommendations regarding breastfeeding and marijuana use on a case by case basis (44%) or recommended continuing breastfeeding despite marijuana use (41%). However, 15% of participants recommended women discontinue breastfeeding if they were using marijuana. Recreational marijuana became legal in Vermont in 2018. The purpose of this study was to replicate the prior study by surveying lactation professionals regarding their recommendations on breastfeeding and marijuana use one year after legalization of recreational use.

Methods: A convenience sample of lactation professionals attending the 2019 Vermont Lactation Consultant Association conference completed a survey regarding their recommendations regarding breastfeeding and marijuana use.

Results: 73% (56/77) of attendees who completed the survey reported working with breastfeeding women who used marijuana. Survey completers estimated that 22% of their breastfeeding clients in the past year used marijuana. 61% (34/56) reported their recommendations about breastfeeding and marijuana were made on a case by case basis. 32% (18/56) reported they recommended women continue breastfeeding despite their marijuana use. Another 7% (4/56) recommended that women discontinue breastfeeding if they cannot stop using marijuana.

Conclusions: One year after legalization of recreational marijuana in Vermont, there appears to be some evidence of increased use among breastfeeding women and that lactation professionals are somewhat more liberal in their recommendations around breastfeeding and marijuana use.

WHAT DO BUDTENDERS TELL PREGNANT WOMEN? PERCEPTIONS OF RISKS AND BENEFITS OF MARIJUANA USE DURING PREGNANCY FROM THE BUDTENDER PERSPECTIVE

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Other
Abstract Category: Original Research
Aim: Our previous research found that pregnant women were obtaining medical and scientific information about risks and benefits of cannabis use during pregnancy from budtenders, or cannabis store retailers, rather than healthcare providers. Therefore, the aim of the study was to determine the perceptions of risks and benefits of marijuana use during pregnancy from the budtender perspective.

Methods: We recruited individuals who self-reported working in cannabis retail stores in a customer interaction role within the past 12 months (i.e., budtenders) in Washington State. We interviewed 10 budtenders and interviews lasted between 30-60 minutes. We achieved representation of eastern, central, and western Washington cannabis retailer store locations. Qualitative description methodology was used to identify common themes in the data.

Results: Five themes emerged from the data. These themes include budtenders 1) viewing marijuana as medicinal during pregnancy, 2) assisting pregnant customers without judgement,

3) engaging in harm reduction behaviors with pregnant customers (i.e., suggesting lower THC products), 4) having mixed opinions on safety and appropriateness of marijuana during pregnancy and postpartum, and 5) noting a lack of training in order to help pregnant customers. Budtenders contrasted marijuana to opioids, noting that pregnant customers were wanting to avoid using pharmaceutical products during pregnancy. It appeared that the more training the budtenders had, the more likely they were to refer pregnant women to low THC or cannabidiol (CBD) products.

Conclusions: We need to engage with budtenders in order to better assist pregnant women and healthcare providers with patient education on marijuana use during pregnancy. Budtenders appeared skeptical of training that was provided by the state and expressed interest in additional classes on research related to marijuana to better assist pregnant and postpartum customers.

VERIFIED CONTRACEPTIVE USE AMONG A SAMPLE OF WOMEN RECEIVING MEDICATION FOR OPIOID USE DISORDER AND AT RISK FOR UNINTENDED PREGNANCY

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Research on HIV and other medication adherence among individuals with substance use disorders (SUD) suggests that self-reported adherence exceeds verified adherence. Little is known about adherence to contraception among women with SUD. To our knowledge, the only study on this topic reported that women with SUD overestimate contraceptive adherence and that adherence to long acting reversible contraception (LARC) (i.e., IUD, implant) is higher than for short acting reversible contraception (SARC) (e.g., pills, ring) based on pharmacy-claims data (PCD). The present study extended this work by verifying contraceptive use using method-appropriate procedures (e.g., pelvic exam for IUD) among women with SUD and at risk for unintended pregnancy who self-reported contraceptive method adherence.

Methods: The study was a secondary analysis of a clinical trial designed to evaluate the efficacy of two contraceptive-management interventions for women receiving medication for opioid use disorder (mOUD) and at risk for unintended pregnancy. At 6- and 12-month assessments, women self-reported contraceptive use for the prior 28 days using Timeline Follow-back and self-reported use was verified by pelvic exam, palpation, pill count, etc. Verified use was calculated both overall as well as by contraception type.

Results: Verified contraceptive use was 72% (42/58) at the 6-month assessment and 75% (38/51) at 12 months. Verified SARC use at 6 months was 45% (13/29), whereas LARC was 100% (29/29). At the 12-month assessment, verified use was 42% (8/19) and 97% (30/32), for SARC and LARC, respectively.

Conclusions: Consistent with the literature on medication adherence among individuals with SUD, verified contraceptive use among women receiving mOUD and at risk for unintended pregnancy was lower than self-reported adherence. Similar to PCD data among women with SUD, agreement was much higher for LARC than SARC. Providers should emphasize the use of LARC in preventing unintended pregnancies among all women, including those with SUD.

SOCIAL ACCEPTABILITY OF MARIJUANA USE AMONG PREGNANT ADULT WOMEN: CORRELATES AND TRENDS IN USE

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Perinatal
Abstract Category: Original Research

Aim: In the US, use of marijuana (MJ) is on the rise. The number of persons aged >12 that used MJ daily in the past year nearly doubled from 2006 to 2014 (3.1 million to 5.7 million). Little is known about the perception of marijuana use by adult women. This is important, as MJ use during pregnancy could be potentially harmful for mother and child. Additionally, women who use MJ may be more likely to develop mental health conditions like anxiety or depression than men who use. The present study examined pregnant women's (1)prevalence rates of MJ use, (2) perceived social acceptability of use, and (3)differences in other psychosocial characteristics among those who find MJ use acceptable vs. not.

Methods: Participants were N=88 pregnant women receiving care in an urban, women's health clinic. Women completed a computerized survey asking them about their complementary and integrative medicine use, substance use, mental health, and chronic health conditions. Analyses included chi-square for categorical and t-tests/ANOVA for continuous measures.

Results: The sample was predominantly African American (43.2%) with a mean age of 28.7 yrs. Approximately 5% of women endorsed recent MJ use. In terms of perceived social acceptability, 44% found MJ use socially unacceptable, 27% found it acceptable, and 27% were neutral. Perceptions of MJ use differed significantly from cigarette use, with most of the sample (52%) reporting cigarettes as unacceptable (p=.013). Pregnant women were more likely to find MJ use socially acceptable if they self-reported depression (p=.02) and anxiety (p=.001).

Conclusions: Changing legal and social policies on medical and recreational MJ use affirm the need for further research to better understand perceptions of use of marijuana in this population. Understanding potential differences in attitudes toward MJ use can help practitioners better counsel women on their choice to use during pregnancy.

Behavioral Economics

DEATH DISCOUNTING: A BEHAVIORAL ECONOMIC ANALYSIS OF HEROIN AND FENTANYL OVERDOSE RISK

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: As fatal overdoses from synthetic opioids continue to rise, there is an urgent need to understand decision-making processes underlying heroin and synthetic opioid use. This study used multiple behavioral-economic tasks to evaluate the effect of fentanyl on opioid consumption and overdose risk.

Methods: Individuals who currently use heroin were recruited online to complete a survey on drug-use behaviors. Participants completed a novel probability-discounting task evaluating the likelihood of using a sample of heroin based on the number of people who had suffered a fatal overdose from that batch, where greater discounting represented less risk. Participants completed hypothetical purchasing tasks for heroin and fentanyl and the heroin severity of dependence scale. Associations among overdose probability discounting, opioid demand, and dependence severity were evaluated.

Results: Responses on the overdose probability discounting task were generally orderly and conformed to a hyperbolic decay function. Although average demand was greater (greater intensity [consumption at low price], and lower elasticity [price-sensitivity]) for heroin than fentanyl, 44% of the sample indicated the same or greater demand intensity for fentanyl relative to heroin. Less probability discounting was associated with greater heroin demand intensity and lower heroin demand elasticity, but was not significantly related to fentanyl demand metrics. Persons demonstrating higher heroin dependence showed reduced overdose probability discounting.

Conclusions: Overdose risk is a less salient factor influencing heroin use in persons with more severe heroin dependence. Fentanyl was on average less preferred than heroin but the majority of participants were still willing to consume fentanyl and hypothetical fentanyl purchasing was equal or greater than that observed for heroin for many participants. These data suggest willingness to use opioids despite overdose risk corresponds to heroin dependence severity, and that a behavioral-economic framework can be used to assess attitudes toward synthetic opioid use and opioid overdose risk.

PHENOTYPE OF RECOVERY: DELAY DISCOUNTING PREDICTS PERCEIVED STRESS AND A CHANCE LOCUS OF CONTROL IN INDIVIDUALS IN RECOVERY FROM SUBSTANCE USE DISORDERS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Understanding individuals who are successful in recovery from substance use disorders will help to inform treatments and preventative measures. Stress has been shown to be associated with both substance use and relapse. Delay discounting is associated with risk of substance use; it is predictive of treatment outcomes and maintained abstinence. Associations between perceived stress, beliefs about locus of control, and delay discounting have yet to be assessed in individuals in recovery from substance use disorder.

Methods: Data from 105 individuals in recovery from substance use recruited from the International Quit and Recovery Registry (IQRR) were analyzed. Individuals completed the adjusting amount delay discounting procedure to obtain delay discounting rates. Level of perceived stress was assessed by the Perceived Stress Scale (PSS). An individual's belief about locus of control was assessed using the Internality, Powerful Others and Chance Scale (IPCS).

Results: Delay discounting was a significant predictor of perceived stress and scores associated with beliefs about a Chance locus of control (i.e., belief that events that occur in an individual's life are because of chance or luck), even after controlling for demographic characteristics. Time in recovery was also significantly associated with delay discounting rates.

Conclusions: The present study indicates that delay discounting can predict perception of stress and beliefs about a chance locus of control in individuals in recovery. This information may aid in understanding, identifying, and assisting individuals that may need different, new, or more intensive interventions for their substance use disorder.

EFFECTS OF DOMAIN-SPECIFIC EPISODIC FUTURE THINKING ON DELAY DISCOUNTING IN REGULAR CANNABIS USERS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Behavior
Abstract Category: Original Research

Aim: Mental simulation of positive future events, Episodic Future Thinking (EFT), improves delay discounting (DD) in nicotine and alcohol users. Recent evidence also suggests EFT may lower DD in cannabis users. Because of cannabis-induced deficits in episodic memory, which limits the ability to create, attend to, and value future events, prompting EFT across life domains may be required to improve DD sufficiently to reduce cannabis use. This ongoing study examines effects of domain-specific EFT (DS-EFT) on episodic event-quality, DD, and cannabis use relative to traditional EFT.

Methods: Active cannabis users (n=60 to date; Amazon mTurk) completed baseline (Day 1), training (Day 2-4), and follow-up (Day 9-11) sessions (Randomized; traditional EFT, DS-EFT, or Episodic Recent Thinking (ERT) controls). All participants created four, self-relevant, and positive events; DS-EFT participants created social, leisure, health, and financial-specific events. Cannabis use was measured at baseline and follow-up; DD and other cannabis-related variables were assessed each session. Event vividness, realism, enjoyment, and importance ratings were assessed during training.

Results: Preliminary results suggest no differences in DD between groups when accounting for baseline DD and covariates ($F_{(2, 47)}=1.6$, p=.22, d=.51), but DS-EFT demonstrated a trend-level improvement in DD relative to EFT and ERT at a moderate effect size ($F_{(1, 48)}=2.90$, p=.095, d=.49). DS-EFT, not EFT, showed higher enjoyment, importance and vividness (p's<.01) relative to ERT. Follow-up comparisons, including effects on cannabis use, are not yet available (only n=29 completed full study).

Conclusions: The moderate effect of DS-EFT on DD and the impact on event ratings relative to EFT and ERT suggests that adding DS may enhance episodic memory processes that strengthen the impact of EFT on cannabis use. More data are needed to confirm these findings given low statistical power. Ongoing enrollment and follow-up data will elucidate the relative effect of DS-EFT on DD and cannabis use during follow-up.

THE PHENOTYPE OF RECOVERY: ASSOCIATION BETWEEN DELAY DISCOUNTING, RECOVERY CAPITAL, AND LENGTH OF ABSTINENCE AMONG INDIVIDUALS IN RECOVERY FROM SUBSTANCE USE DISORDERS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Recovery capital is defined as the amount of resources (e.g., physical, social, environmental, health, and personal) available to initiate and sustain recovery from substance dependence. As recovery capital is defined by the accumulation of tangible and intangible resources, duration of recovery may be a determinative factor. Recent research also suggests that a lack of resources may shift attention to problems in the present, perhaps reducing attention to planning for the future (i.e., delay discounting). The aim of the current study is to examine associations between recovery capital, duration of recovery, and delay discounting.
Methods: Participants (N=141) were recruited from The International Quit and Recovery Registry, an ongoing data collection program used to further scientific understanding of recovery. Discounting rates were assessed using an adjusting-delay task and recovery capital was assessed using the Recovery Capital Scale (RCS). Zero-order correlations and multiple linear regressions controlling for demographic variables were conducted to determine whether delay discounting, duration of recovery, or an interaction term predicted RCS.
Results: Delay discounting was significantly correlated with RCS score and duration of recovery. Duration of recovery was also correlated with RCS. A multivariate linear regression indicated that delay discounting was significantly associated with RCS score even when controlling for age, gender, education, race, annual household income, and primary addiction. Duration of recovery did not significantly predict RCS when demographic variables were included in the model.

Conclusions: These data suggest that duration of recovery is not a primary determinant of recovery capital. Although multiple factors (e.g., scarcity of resources, time perspective) may contribute to the observed association between delay discounting and recovery capital, these findings support research suggesting that delay discounting may serve as a marker to identify subgroups with higher risk of relapse.

INCREASED DISCOUNTING OF SEXUAL, BUT NOT MONETARY OR SOCIAL, OUTCOMES IN MALES FOLLOWING INTRANASAL OXYTOCIN ADMINISTRATION

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Abstract Detail: Human
Drug Category: Other, Oxytocin
Topic: Behavior
Abstract Category: Original Research
Aim: There is increased interest in using oxytocin as a pharmacotherapy for substance use disorders across a number of drug classes. Substance use disorders are also associated with risky sexual behavior. Although much of the research to date on oxytocin has focused on pro-social behaviors, stress reduction, sexual processes, and social bonding, few studies have evaluated oxytocin's influence on risky sexual behavior or decision-making processes. This study aimed to address this gap by determining the influence of exogenous oxytocin on sexual arousal and desire and on decision-making processes for social, monetary, and sexual outcomes.

Methods: Healthy adults (n= 23) participated in two experimental sessions lasting approximately 2 hours each. Participants received oxytocin (40 IU) or placebo administered intranasally in a counterbalanced order across sessions. At the time of expected peak drug effect (e.g., 45-60 min post-administration), participants completed the Sexual Arousal and Desire Inventory (SADI), the Sexual Delay-Discounting and Sexual Probability-Discounting Tasks (which assess condom-use likelihood across increasing delays to condom availability or STI-contraction probability, respectively), monetary delay and probability discounting tasks, and a social discounting task.

Results: When considering the full sample, no differences were detected between placebo and oxytocin on any of the discounting tasks. However, males endorsed significantly reduced condom-use likelihood relative to females after oxytocin administration on the Sexual Probability Discounting Task. There were no drug or gender differences among the SADI subscales.

Conclusions: These data indicate that intranasal oxytocin may influence decision making for sexual, but not monetary or social, outcomes at the dose tested. Oxytocin may increase sexual risk behaviors in males, independent of sexual arousal or desire. These results suggest that sexual risk behaviors should be considered in the context of further development of oxytocin as a pharmacotherapy for substance use disorders.

ASSOCIATIONS BETWEEN CANNABIS USE AND MOTIVATION USING THE EFFORT-EXPENDITURE FOR REWARDS TASK

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Behavior
Abstract Category: Original Research
Aim: The literature on the effects of cannabis on motivation has yielded mixed results. Most studies use self-report measures, which have inherent disadvantages in assessing motivation. Emerging evidence, mostly from adult samples, suggests that performance-based motivation measures, such as the Effort Expenditure for Rewards Task (EEfRT), may better capture associations between cannabis use (CU) and motivation. This study examined whether CU was associated with motivation as assessed by the EEfRT among emerging adults.
Methods: Participants were a subset of 16- to 21-year-olds (n=55; 21 Males, 34 Females, 25 current cannabis users) from a study on CU and decision-making. Participants completed a detailed substance use assessment and the EEfRT, in which participants chose between "easy" and "hard" conditions on each trial and completed continuous key presses during each trial to earn money. The amount and probability of earning money varied by trials. Motivation was quantified as the proportion of "hard" choices.

We conducted multiple linear regressions, with EEfRT performance as the DV, to examine the association between motivation and self-reported CU frequency or amount over the past 6-months or 30 days. Covariates tested for model inclusion were age, estimated IQ and sex.

Results: Only sex approached significance (p= .099) in predicting EEfRT performance, with males choosing a higher proportion of "hard" choices. Therefore, only sex was included as a model covariate. Across analyses, no significant associations were observed between EEfRT performance and CU frequency or amount, ps > .05.
Conclusions: Our findings do not support a link between EEfRT-assessed motivation and CU in a sample of adolescents/young adults. Lower levels or shorter duration of CU in this sample may explain the lack of significant associations. Future studies may benefit from exploring differences in association with CU across different EEfRT conditions (e.g., reward magnitude, probability of winning) or in a sample of heavier cannabis users.

USING THE CIGARETTE PURCHASE TASK TO EXAMINE THE RELATIVE REINFORCING VALUE OF CIGARETTES AMONG MOTHERS WITH VERSUS WITHOUT OPIOID DEPENDENCE

Tyler Nighbor[1], Sulamunn Coleman[1], Janice Bunn[1], Michael DeSarno[1], Adam Morehead[1], Katherine Tang[1], Diana Keith[1], Shirley Plucinski[1], Allison Kurti[1], Ivori Zvorsky[2], Stephen Higgins[1]*

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Behavior
Abstract Category: Original Research
Aim: The Cigarette Purchase Task (CPT), in which participants estimate the number of cigarettes they would smoke across increasing cigarette prices, measures the relative reinforcing value of cigarettes. Although opioid-dependent individuals are particularly vulnerable to tobacco addiction, more research is needed to elucidate whether and to what

extent their motivation to smoke differs from not-opioid-dependent smokers controlling for potential sociodemographic differences.

Methods: Participants were 173 women (65 opioid-dependent) in an ongoing clinical trial for smoking cessation. Baseline CPT responses were compared between opioid-dependent and not-opioid-dependent women using five demand indices: Demand Intensity; Omax; Pmax; Breakpoint (BP); and α, and two latent factors: Amplitude and Persistence. Final regression models adjusted for sociodemographic characteristics differing between the two groups.

Results: Opioid-dependent women had greater Demand Intensity (i.e. number of cigarettes they would smoke if they were free) than not-opioid dependent women in the adjusted model ($F_{(1, 156)} = 6.93$, $p = .016$). No other demand indices differed significantly. Regarding latent factors, demand Amplitude (i.e., volumetric consumption), but not Persistence (i.e., price insensitivity), was greater for opioid-dependent women in the adjusted model ($F_{(1, 146)} = 4.04$, $p = .046$).

Conclusions: These results further demonstrate that the CPT is a highly sensitive task that can illuminate potentially important individual and population differences in the relative reinforcing value of smoking. Greater Demand Intensity and Amplitude differentiated smokers with comorbid opioid dependence; thus, decreasing smoking prevalence among opioid-dependent populations may require policies and interventions that can decrease cigarette Demand Intensity and Amplitude.

DEVELOPING A NOVEL PREGNANCY RISK DELAY DISCOUNTING CONDITION FOR PATIENTS RECEIVING OPIOID USE DISORDER TREATMENT IN RURAL APPALACHIA

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research
Aim: An emerging area of research in addiction science is the intersection of addiction and sexual health. Both addiction and sexual health decisions can be affected by impulsive decision-making. Delay discounting tasks are a common way to measure impulsive decision-making. Extant sexual delay discounting research has focused on whether potential partner attractiveness or STD risk can shift the likelihood of delaying sex until a condom is available; however, previous research has not yet considered the role of pregnancy risk may have in shifting condom preferences.

Methods: Participants from an Appalachian, buprenorphine/naloxone opioid use disorder treatment clinic (N=113; M+SD=34.2+8.8 years; 92.9% Caucasian; 73.5% women) completed a series of block randomized, computer-administered, hypothetical sexual delay-discounting tasks (i.e., High and Low Attractiveness, STD Risk, Pregnancy Risk) using ecologically relevant delays to condom use (immediately available; 2min.; 5min.; 15min.; 30min.; 1hr.; 3hr.; 6hr.). Condom Pleasure, Stigma, and Embarrassment were assessed with the UCLA Multidimensional Condom Attitudes Scale.

Results: Broadly, differences in condom preferences were observed both between and within sexual domains. There was a lower likelihood of waiting until a condom was available in the

High Attraction and Low STD Risk conditions compared to Low Attraction, High STD Risk, and both High and Low Pregnancy Risk conditions (all p's < .05). Additionally, higher Condom Pleasure was associated with a greater likelihood of waiting until a delayed condom was available in the High Attraction [rs (111) =.367, p < .01], Low STD Risk [rs (111) = .270, p < .01], and Low Pregnancy Risk [rs (111) = .360, p < .01] conditions.

Conclusions: Meaningful differences in condom preference were observed between the Pregnancy Risk and Attractiveness/STD Risk conditions suggesting that Pregnancy Risk is a novel sexual risk condition that should be considered in future addiction and sexual health research.

ECONOMIC EVALUATION OF A SMARTPHONE ALCOHOL DRINKING-REDUCTION INTERVENTION FOR ADULTS WITH HIV

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Technology Issues
Abstract Category: Original Research
Aim: Alcohol use among people living with HIV (PLWH) reduces adherence and worsens health outcomes. We evaluated the economic cost of a smartphone application (HealthCall) found to be effective in reducing drinking and improving antiretroviral adherence among heavy-drinking PLWH using data from a 60-day trial.
Methods: Participants enrolled from an HIV clinic were randomized to receive a brief drinking-reduction intervention with either a) the NIAAA Clinician's Guide (CG, n=37), b) the HealthCall app to monitor daily alcohol consumption with the CG (HealthCall+CG, n=38), or c) HealthCall with motivational interviewing (HealthCall+MI, n=39). Cost data were collected prospectively alongside the trial and during site visits. We used micro-costing to evaluate start-up costs and the incremental cost per participant receiving CG only, HealthCall+CG, or HealthCall+MI incurred from the healthcare sector perspective in 2018 USD, applying national labor and fringe rates. We also investigated potential cost offsets using self-reported healthcare utilization.
Results: The start-up cost, primarily staff training, was $190 for CG, $490 for HealthCall+CG, and $520 for HealthCall+MI. Pre-screening for alcohol dependence, scheduling appointments, and retention cost $9 per participant. Participants attended an average of 2.9 intervention visits; each participant visit cost $29 for CG, $32 for HealthCall+CG and $15 for HealthCall+MI. HealthCall app troubleshooting and support over the 60-day intervention cost $6 per HealthCall+CG participant and $4 per HealthCall+MI participant. The total delivery cost per participant was $94 for CG, $114 for HealthCall+CG and $56 for HealthCall+MI. No significant differences in healthcare utilization occurred among the three groups over the 12-month follow-up period.
Conclusions: The cost of delivering the HealthCall smartphone drinking reduction app for heavy-drinking PLWH was modestly higher than using the NIAAA CG alone, but lower when added to MI delivered by a non-clinician. HealthCall may be a relatively low-cost option for addressing alcohol use and antiretroviral adherence among PLWH.

USING EXPERIMENTAL AUCTIONS TO DETERMINE INCENTIVE LEVELS FOR SMOKING CESSATION: A PILOT STUDY

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Treatment
Abstract Category: Original Research

Aim: We evaluated the feasibility and effectiveness of using a willingness-to-accept auction (WTA) for one week of smoking cessation in addition to the cost per quit.
Methods: Two phases were conducted. In phase 1, smokers ready to quit (n=10) evaluated the WTA auction instructions, participated in a hypothetical auction, and provided related feedback. In Phase 2, smokers ready to quit (n=35) participated in a WTA auction whereby they named the amount between $0 and $100 that they needed to be paid to quit for one week. Individuals won the auction if a random draw was greater than their stated price. Winners received the randomly drawn amount if they quit smoking for one week. Smokers were also provided a one-week supply of nicotine replacement therapy and a brief cessation counseling session. Carbon monoxide level was monitored remotely 3 times during the quit week and in person at the final session.
Results: Phase 1 qualitative results supported the removal of a portion of the auction instructions. In Phase 2, participants who smoked their first cigarette within 5 minutes of waking bid significantly more in the auction than those who waited ($p < .05$). Among auction winners, 45% quit smoking for one week compared to only 13.3% of individuals who lost the auction ($p < .05$). Moreover, the cost per quit (accounting for study and cessation incentives, supplies) for those who won the auction, and received an incentive for quitting, was $466 compared to $894 for those who did not win the auction.
Conclusions: WTA auctions may be an effective way to approximate the amount smokers need to be paid to quit, which would allow researchers to estimate the most cost-effective payment to offer as part of incentive-based smoking cessation programs. Replication evaluating long-term cessation outcomes with larger samples is warranted.

DEVELOPMENT OF A BRIEF ASSESSMENT FOR OPIOID DEMAND

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: Opioid use disorder is a serious public health issue, and opioid related misuse and death have increased over the last two decades. The purpose of the current study was to 1) develop a brief, web-based, behavioral economic assessment of opioid demand; 2) compare opioid demand measures (Q0, Omax, Break Point) with self-reported, pain-related measures; and 3) compare demand measures with inpatient opioid risk-related measures.

Methods: Participants (N = 104) consisted of patients from a level I trauma center in Houston, TX. Inpatient opioid risk-related measures included the Opioid Risk Tool (ORT), Numeric Pain Rating Scale (NPRS), and daily Morphine Milligram Equivalent (MME). Opioid demand and other self-reported, pain-related measures (i.e., pain severity, taking pain pills, pain hindering usual activities, stress about pain, need for additional pain treatment) were assessed following discharge using a web-based survey 2-4 weeks post-discharge. Correlation and regression analyses evaluated relationships between demand, opioid risk, and pain measures.
Results: Opioid demand measures were significantly associated with pain-related measures. Q0 was associated with all pain-related measures, while Omax and Break Point were associated with some measures. Demand measures were not significantly associated with the ORT or the NPRS. However, Q0 was significantly associated with daily MME scores ($Z = 1.995$; $p = 0.046$).
Conclusions: Post-discharge opioid demand was associated with post-discharge pain-related measures as well as inpatient MME, a direct measure of opioid administration. Taken together, these findings support the construct validity of our opioid demand measure and may help identify those at risk for developing opioid use disorder.

A SYSTEMATIC REVIEW AND META-ANALYSIS OF DELAY DISCOUNTING AND CANNABIS USE

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Behavior
Abstract Category: Literature Review
Aim: Delay discounting (or delayed reward discounting) refers to the systematic reduction in the value of a reinforcer as a function of the delay to its delivery. Theoretical and empirical work suggests that delay discounting is a key behavioral mechanism underlying substance use disorder. Existing work on cannabis use, however, is mixed with many studies reporting null results. The purpose of the current systematic review and meta-analysis was to provide an in-depth assessment of the association between delay discounting and cannabis use.
Methods: We conducted meta-regression analyses to determine the omnibus correlation between delay discounting and cannabis use and evaluate task-based and sample-based moderators. Studies included in the meta-analysis evaluated an association between delay discounting and cannabis quantity-frequency or severity measures in human participants (24 studies, 51 effect sizes, 10,437 participants). A robust variance estimation method was used to account for dependence among effect sizes.
Results: A small effect size omnibus relationship was observed ($r = .084$) reflecting a significant, but small relationship in which greater cannabis use/severity was associated with greater discounting. Incentive structure and outcome type were each significant and unique moderators such that incentivized tasks (over hypothetical) and estimates for cannabis severity measures (over use rate) showed stronger associations.
Conclusions: These results suggest that, to date, there is a limited relationship between delay discounting and cannabis use that depends on factors like the nature of the discounting task and outcome measured. Consistent with the moderating role of severity, the overall modest relationship between delay discounting and cannabis use may reflect the smaller magnitude of perceived long-term clinical outcomes associated with cannabis compared to other drugs of

abuse. Future work is needed to expand the variables studied (e.g., discounted commodities), explore alternative moderators, and evaluate the predictive contribution of delay discounting for long-term variations in cannabis use.

Cannabis

PERCEPTION OF AND USE OF CANNABIS BY SPORTS PERSONS IN LAGOS NIGERIA

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research
Aim: Current global trends seem to encourage a more liberal view of cannabis use. Cannabis in all forms remains an illegal product in Nigeria with non of the CBD-derived medication yet on the national pharmacopiea. This study sought to determine the knowledge, attitude and use of cannabis among a population of sports persons at one of the national stadiums.
Methods: Focus groups discussion sessions were conducted among three male and two female homogenous groups derived using age and major sport of interest. The discussions were recorded in an audiotape and transcribed and coded. Themes were derived manually by the researchers after transcription.
Results: There were 42 participants in all. Nineteen (41%) of participants reported that they had ever used cannabis while 32 persons (76%) reported knowing someone who had used the product in the past month. Key themes that we derived centered on cigarette smoking being the gateway for use, smoking being the major form of use followed by cooking in form of broths. All persons who admitted ever use reported at least one quit attempt over the past year. The greatest motivation for use was the perceived ability to enhance stamina, sporting performance and overall alertness. Fear of teeth discoloration and poor sleeping habits were the major demerits cited. Barriers to quitting were peer pressure and poor sporting performance. Some quotes made by respondents which resounded across all groups were "I don't want to lose out" and "I will quit later".
Conclusions: We observed that active interest in competitive sporting activities seemed to be a major motivation for cannabis use by the respondents. Exploratory studies on the combination of cannabis with other illicit substances and its effect on performance would be beneficial. Negotiating skills to avoid initiation may also be a part of an intervention in this population.

INTERCORRELATIONS BETWEEN A PERFORMANCE-BASED AND SELF-REPORT MEASURES OF MOTIVATION AND THEIR ASSOCIATIONS WITH SYMPTOMS OF DEPRESSION AMONG CANNABIS-USING ADOLESCENTS AND EMERGING ADULTS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Adolescent
Abstract Category: Original Research
Aim: Reduced motivation has been reported as a consequence of cannabis use. However, studies vary in their methods of assessing motivation, and little is known about how these measures relate to each other, particularly among younger substance users. The current study examines correlations between two self-report questionnaires, a behavioral task, and a depression scale, as amotivation is often a symptom of depression and has been associated with heavy cannabis use.
Methods: Participants were 44 adolescent/emerging adult cannabis users and non-users (ages 16–19), from a larger longitudinal study, who completed the Effort-Expenditure for Rewards Task (EEfRT), the Apathy Evaluation Scale (AES), the Motivation and Engagement Scale (MES), and the Depression, Anxiety, and Stress Scale (DASS-21). We used the AES score; the MES scores of self-efficacy, planning, persistence, valuing school, and disengagement; and the proportion of hard choices on the EEfRT as our measures of motivation.
Results: Results showed statistically significant correlations among the AES and four MES subscales. Greater apathy in the AES was associated with lower persistence (r=-.532), valuing school (r=-.451), planning (r=-.496), and greater disengagement (r=.546), p-values < 0.05. Similarly, the AES and two MES subscales were significantly correlated with symptoms of depression, such that depression was associated with lower persistence and higher apathy and disengagement. No significant correlations were observed between the proportion of hard choices on the EEfRT and the self-report scales, p-values > 0.05.
Conclusions: Results suggest that self-report measures of motivation may be assessing a different construct than performance-based measures. Further, self-report measures of depression appear to be more strongly correlated with self-report rather than performance-based measures of motivation. Our study is limited by use of only one behavioral measure of motivation and a relatively small sample size. Future studies will benefit from use of more motivation measures and larger sample sizes.

THE EFFECTS OF Δ9-TETRAHYDROCANNABINOL (THC) VAPOR EXPOSURE IN THE MAINE LOBSTER

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Abstract Detail: Animal Study
Drug Category: Marijuana/Cannabinoids
Topic: Behavior
Abstract Category: Original Research
Aim: The aim of this study was to characterize the effects of THC vapor in the Maine lobster, a novel animal model for drug abuse research. To this end, we used a vapor delivery model based on e-cigarette technology to determine if THC levels in tissue could be detected following THC vapor exposure. Additionally, we determined the nociceptive and locomotor effects produced by THC vapor exposure.
Methods: Maine lobsters (Homarus americanus) were exposed to THC vapor using a vapor delivery system based on e-cigarette technology. Exposure sessions were 30 to 60 minutes in

duration. Animals were exposed to vehicle (propylene glycol; PG) or to 100 mg/mL THC in PG. Tissue was collected and analyzed for THC levels using LC-MS. We determined the anti-nociceptive effects of THC using a hot water bath and measuring withdrawal latency of tail, claws, and antennae. Baseline nociception was determined using a gradient of hot water temperatures compared with ambient water temperature. We additionally measured locomotor behavior following drug exposure.

Results: THC vapor exposure produced duration-related levels of THC in all tissue examined. The anti-nociceptive effects of THC were minimal, however, THC vapor increased locomotor behavior at the longest exposure duration.

Conclusions: These data show that THC vapor exposure produces detectable levels of THC in tissue and produces locomotor effects in the Maine lobster. These data confirm a method for studying the effects of THC vapor in a lobster model

IMPAIRED DRIVING PERFORMANCE IN CURRENT, HEAVY, RECREATIONAL CANNABIS USERS IS NOT OBSERVED IN FORMER USERS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Behavior
Abstract Category: Original Research
Aim: Previously, we demonstrated that non-intoxicated, chronic, heavy recreational cannabis users exhibit poorer driving performance relative to non-using healthy controls (HC), with performance differences localized to individuals with early onset of cannabis use. However, it is important to assess whether performance deficits remain after cessation of cannabis use. Accordingly, as an extension of our previous study, we recruited a sample of former, heavy cannabis users, and predicted that former users would demonstrate similar performance to the HCs.

Methods: Cannabis users with early (regular use age <16; n=14) and late (regular use age ≥16; n=14) onset of use were compared to HCs (n=16) and former users (n=12) on a driving simulator program (STISIM Drive). Current cannabis users reported using ≥5 out of the last 7 days. At time of testing, current cannabis users were abstinent for ≥12 hours and not acutely intoxicated, and former users reported an average of 38.64 months of abstinence.

Results: Early onset cannabis users demonstrated poorer performance on the driving simulator with more pedestrians hit than HCs (p=.04); more collisions than late onset users (p=.02); more missed stop signs than HCs (p=.01) and late onset users (p=.03); fewer stops at red lights than HCs (p=.01), late onset users (p=.01) and former users (p<.01); more speed exceedances than HCs (p=.02); greater percentage of time spent over the speed limit than HCs (p=.03) and former users (p=.04); and more centerline crossings (p=.03) relative to HCs. No significant differences were detected between the former users and the HC or late onset groups.

Conclusions: Former heavy, cannabis users and HCs exhibited similar performance on a driving simulator. These data extend previous research that early onset of cannabis use is associated with impaired driving and provide preliminary evidence for improved driving performance after cessation of cannabis use.

VARENICLINE AS A TREATMENT FOR CANNABIS USE DISORDER: A PLACEBO-CONTROLLED PILOT TRIAL

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[1]*Medical University of South Carolina*

Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Treatment
Abstract Category: Original Research
Aim: The primary is to determine varenicline's potential as a candidate treatment for cannabis use disorder.
Methods: Participants in this 6-week pilot trial were randomized to receive either varenicline (goal dose 1 mg twice daily; n=35) or matched placebo (n=37), added to a brief motivational interviewing intervention. Cannabis use outcomes included: a) cannabis abstinence, b) creatinine-corrected urine cannabinoid reduction, c) reduction in use frequency and intensity, noted as the percentage of weekly use days (frequency) and reported use sessions (intensity). Outcomes were collected during study weeks 3-6, following an initial one-week medication titration period and two-week maintenance dose period.
Results: While this preliminary pilot trial was not powered to detect statistically significant between-group differences, participants randomized to varenicline evidenced numerically greater rates of self-reported abstinence during study weeks 3-6 [Overall: Varenicline: 22.4% vs. Placebo: 9.5%; RR=2.1 (0.7,6.8)], with the most pronounced differences at the final study visit [Week 6: Varenicline: 27.3% vs. Placebo: 8.0%; RR=2.7 (0.7,10.0)]. End-of-treatment creatinine-corrected urine cannabinoid levels were lower in the varenicline group and higher in the placebo group compared to baseline measures [Change from baseline: Varenicline -1.7 ng/ml (-4.1,0.8) vs. Placebo: 1.9 ng/ml (-0.4,4.3); Δ=3.5 (0.1,6.9)]. Participants in both treatment groups noted significant decreases in both percentage of days used and use sessions per day during treatment compared to baseline. Varenicline participants reported numerically greater overall decreases in percentage of self-reported cannabis use days as compared to placebo [Change in % days using from baseline: Varenicline: -41.7% (-26.3,-57.0) vs. Placebo: -27.4% (-13.0,-41.8); Δ=14.3% (-7.1,35.7)]. Similarly, varenicline participants reported numerically greater overall reduction in cannabis use sessions per day as compared to placebo [Change in sessions per day from baseline: Varenicline: -2.1 (-1.7,-2.5) vs. Placebo: -1.8 (-1.4,-2.1); Δ=0.3 (-0.2,0.9)].
Conclusions: These results indicate that fully powered testing of varenicline as a candidate treatment for cannabis use disorder is warranted.

OPEN LABEL PILOT STUDY OF LORCASERIN FOR CANNABIS USE DISORDER

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Treatment
Abstract Category: Original Research

Aim: To assess the tolerability and potential effects of lorcaserin (5HT2C agonist) on cannabis use in individuals with cannabis use disorder (CUD) seeking treatment in an outpatient clinic setting.

Methods: In a 10-week open label trial, the tolerability of lorcaserin (up to 20mg daily administered weeks 2-9) was tested in men and women seeking outpatient treatment for CUD. Adverse events were assessed weekly. Cannabis use was assessed twice weekly by self-report measures of frequency and amount used (in grams and dollars) by the timeline follow-back assessment and quantitative urine THC metabolite levels.

Results: Seventeen participants enrolled in the study and 10 completed all 10-weeks. 4 participants dropped prior to receiving any medication. The average age of participants was 35 years, majority were male (N=12), with diverse economic, religious, educational and racial backgrounds. Overall the medication was well tolerated. There were no serious adverse events. The most common adverse events were headache (N=3), anorexia (N=3), and irritability (N=2). Participants decreased their days of cannabis use per week significantly (p = .0003) with each week in the trial, adjusted for the number of using days in the 4 weeks prior to beginning the study. By the end of the 10-week trial, participants significantly decreased by approximately 1.76 (SE=0.47) cannabis using days per week. Average daily cannabis amount in grams and dollars per day in addition to urine THC metabolite levels did not change significantly over the course of the trial.

Conclusions: Lorcaserin is a well-tolerated and promising medication in the treatment of CUD worth further evaluation in a placebo-controlled, double-blind, randomized clinical trial. As suggested by recent trials in the treatment of CUD, non-abstinent outcomes consistent with reduction in cannabis use need further consideration and exploration of clinically meaningful endpoints.

PSYCHOSOCIAL CORRELATES OF EXECUTIVE FUNCTION IN INDIVIDUALS WITH OPIOID USE DISORDER WHO ARE ACTIVELY USING OPIOIDS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: Psychosocial stress is known to affect substance use disorders. Little is known about how psychosocial stress relates to cognitive function and trajectories of opioid use disorder (OUD), specifically. Executive function (EF) is known to be impaired in substance abusers, and poor EF may adversely impact treatment adherence and treatment for OUD. The aim of this pilot study was to explore psychosocial factors associated with EF.

Methods: Community-based recruitment occurred using advertisements and referral from study participants. Eligibility included 18 years or older, opioid use in the past 90 days, and screening positive for DSM-5 OUD. Participants completed a questionnaire about substance use, social instability, food insecurity, drug use stigma, social support, perceived stress, depression, anxiety, and trauma. Executive function was assessed using a computerized version of the Iowa Gambling Test, a measure of risky decision-making, such that a higher proportion of advantageous selections (low risk, low reward) indicated better EF. Robust linear regression

adjusting for age, race, education, and opioid severity was used to identify psychosocial factors associated with EF.

Results: The 46 participants were primarily male, white non-Hispanic, and >40 years; 89% used opioids at least weekly, 74% used within 48 hours of study participation, and polysubstance use was common. Higher anticipated drug use stigma was associated with worse EF (B= -3.05, p=0.01); higher emotional social support was associated with better EF (B=4.10, p=0.01). Higher food insecurity (B=0.43, p=0.01) and moderate cannabis use (B=6.04, p=0.03) were also associated with better EF.

Conclusions: Higher social support, lower stigma, and, paradoxically, more food insecurity and cannabis use were all strongly associated with better EF in individuals with OUD. Interventions that focus on social support and stigma could support improvements in EF and may improve OUD treatment retention (behavioral and pharmacological). Further studies are needed to clarify paradoxical findings.

CANNABIS DISORDER SCREENING TOOLS DO NOT FUNCTION DIFFERENTLY FOR MEDICAL CANNABIS USERS WHO USE FOR COPING MOTIVES

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: The Cannabis Use Disorders Identification Test-Revised (CUDIT-R) is a widely used assessment of problematic cannabis use (Adamson et al., 2010). There is ongoing debate in the literature about whether the CUDIT-R is a biased assessment among cannabis users who use for coping or medicinal purposes. The current study examined whether the CUDIT-R was subject to differential item functioning (DIF) for cannabis dispensary patient who used cannabis to cope compared to those who used for other reasons. DIF occurs when participants who have similar overall scores but vary on some third factor do not have the same probability of endorsing specific assessment items (Edwards & Edelen, 2009). If DIF occurs, the assumption of measurement invariance is violated, suggesting that the underlying construct is not being measured consistently across groups (Millsap, 2011).
Methods: Participants were 217 adults who were recruited from medical cannabis dispensaries in San Francisco, CA, and completed on online survey. Participants were classified as having coping motives for cannabis use based on scoring 6 or greater on the coping subscale of the Comprehensive Marijuana Motives Questionnaire (CMMQ; Lee et al., 2009). Each of the 8 items on the CUDIT-R were tested for coping-based DIF by stratifying on total CUDIT-R severity.
Results: Despite sufficient power to identify the presence of DIF, no item on the CUDIT-R showed significant indication of DIF by coping motives based on the Mantel Chi-Square, Standardized Liu-Agresti Cummulative Common Log-Odds Ratio, and the Standardized Cox's Noncentrality Parameter (Table 1).
Conclusions: The CUDIT-R does not show evidence of biased responding among medical cannabis users who use for coping purposes. Results support its use as a screening tool among medicinal cannabis users.

INFLUENCE OF PREGABALIN MAINTENANCE ON CANNABIS EFFECTS AND RELATED BEHAVIORS IN DAILY CANNABIS USERS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Treatment
Abstract Category: Original Research

Aim: No medications are approved for cannabis use disorder (CUD), though a small clinical trial demonstrated that the voltage-dependent calcium channel (VDCC) ligand gabapentin reduced cannabis use in treatment seekers. VDCCs are modulated by cannabinoid (CB) ligands and there are shared therapeutic effects between CB agonists and VDCC ligands. This overlapping neuropharmacology and the initial promising clinical results supported the hypothesis that maintenance on pregabalin, a "next-generation" VDCC ligand, would reduce cannabis self-administration.

Methods: Fourteen (3F, 11M) non-treatment-seeking daily cannabis users participated in a placebo-controlled, double-blind, counterbalanced, within-subjects study. The protocol consisted of two 15-day outpatient maintenance phases (0 or 450 mg pregabalin/day) with eleven maintenance days and four experimental sessions within each phase. During experimental sessions, maintenance continued and participants completed two 2-day blocks of sampling and self-administration sessions to determine the reinforcing effects of smoked cannabis (0 and 5.9% THC) using a progressive-ratio choice (cannabis puffs vs. $0.50) procedure. Naturalistic cannabis use, the subjective, performance and physiological responses to cannabis, attentional bias to cannabis cues and side effects, sleep quality, craving, and other self-reported substance use during pregabalin maintenance were also measured.

Results: Thirteen subjects completed both study phases; one completed one phase. Data analysis is ongoing and uses generalized estimating equations with random subject effects to fit a linear model for each outcome. Preliminary results indicate that cannabis functioned as a reinforcer in a subset of subjects (i.e., after omitting 3 non-responders; puffs 0% THC = 4.0; puffs 5.9% THC = 5.8, collapsed across treatment), but pregabalin did not attenuate cannabis self-administration (5.8 puffs of 5.9% THC cannabis during placebo treatment; 5.8 puffs of 5.9% THC cannabis during 450 mg pregabalin treatment).

Conclusions: These results do not support the use of 450 mg pregabalin as a monotherapy for CUD.

Commentary/Program Description/Review

HOUSING FIRST: A HARM REDUCTION STRATEGY FOR HOMELESS PEOPLE WITH SEVERE SUBSTANCE USE DISORDER(S)

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)

Topic: Other
Abstract Category: Program Descriptions
Aim: By the completion of this presentation, attendees will 1) have an understanding of Housing First as a harm reduction model as well as the evidence that supports its effectiveness in housing homeless people with substance use disorders. 2) Attendees will also learn about a unique Housing First program in Vancouver, Canada, called Alexander Street Community, which has an embedded multidisciplinary clinic that incorporates many innovative harm reduction techniques including access to safe consumption spaces and low-barrier access to various opiate agonist treatments.

Conclusions: Housing First is a harm-reduction model rooted in the philosophy that housing is a basic human right and that people do better when they have access to community-based services that nurture well-being and social integration. Housing First models are associated with health benefits including: reduction in HIV risk-behaviours and all cause mortality, decreased use of acute health services, greater food security, and improvement in community functioning. There's an increasing number of Housing First programs providing low-barrier housing in North America. Highlighted here is Vancouver's Alexander Street Community (ASC), one of 14 buildings operated by the Portland Hotel Society (PHS), a non-profit organization that provides housing, harm reduction, primary care, and advocacy to those poorly served in Vancouver and Victoria, British Colombia, Canada. There is a multidisciplinary clinic embedded within ASC that includes a social worker, nurses, mental health workers, home support staff, peer supports, and a primary care physician who work together to provide cohesive care for residents on a voluntary basis. The team works in partnership with various mental health community teams to care for the residents with the highest burden of mental illness. Many community wellness, cultural, and recreational groups engage with the residents. ASC's unique model is important to share given that housing and mental health have become emerging priorities in many North American cities.

MISATTRIBUTION OF SUBSTANCE OVERDOSE DEATHS CAN BE DEADLY: LESSONS FROM OPIOIDS, VAPING, AND KRATOM, AND A PERSPECTIVE FROM HIV AIDS

Jack Henningfield[1], Jane Babin[2], Oliver Grundmann[3], Sidney Schnoll[1], Judy Ashworth[1], Rachel Beck[1], Edward Cone[1]*

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Abstract Detail: Human
Drug Category: Other, opioids, nicotine tobacco, HIV AIDS
Topic: Other
Abstract Category: Theoretical/Commentary
Aim: Assess three substances-associated with deaths, initial misattribution of cause of death and communications that may confused health professionals, policymakers and the public, and delayed effective interventions and to develop more accurate forensic and communication approaches.
Methods: The initially identified risk factors and messaging from the Centers for Disease Control and Prevention (CDC) and Food and Drug Administration (FDA) were assessed for (1) prescription and illicit opioids including fentanyl, (2) vaping related acute lung disease (VALD), and (3) kratom. These histories are compared to the first years of the HIV/AIDS epidemic.

Results: For all three substances, initial assessments of the cause of death contributed to media messaging that appears to have delayed the emergence of more accurate and effective communications and interventions. Delayed messaging about HIV/AIDS risk factors also perpetuated false perceptions that had to be overcome to enable a more accurate and massive communications effort led by Surgeon General Koop to help turn the tide of the epidemic.

Most opioid overdose deaths were not due to legitimately prescribed opioids, but rather to illicit substances including diverted and counterfeit (medicines used by people who had no prescriptions for them yet overprescribing became the primary focus of messaging and interventions even as deaths from heroin and illicit synthetic opioids grew to health crisis proportions. Similarly, as VALD spread, the message that illicit cannabinoids mixed with lung toxins could be deadly was lost under headlines that e-cigarettes, in general, were to blame and many people returned to cigarette smoking.

Conclusions: Accurate life-saving communications and interventions began to be implemented for opioids and vaping; yet, the dominant misattribution of morbidity remains for kratom. Lessons are also provided by efforts including risk factor identification, risk-reducing interventions, and related communications concerning the HIV/AIDS epidemic. Improving the quality and consistency of forensics and medical examiner assessments is vital.

CONFLICTS OF INTEREST AND SUBSTANCE USE RESEARCH: LEARNING FROM THE PAST, ACCOUNTING FOR THE PRESENT, AND PREPARING FOR THE FUTURE

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Abstract Detail: Human
Drug Category: Other, research ethics, scientific integrity
Topic: Other
Abstract Category: Literature Review
Aim: The field of substance use research has changed considerably since the formation of CPDD as a membership organization in 1991. Changes include shifts in terminology/diagnostic criteria, technological innovation (e.g., cloud-based computing, mobile health), changing regulation (e.g., cannabinoids, prescription opioids, electronic cigarettes). Separately, funding sources have been altered U.S Food and Drug Administration funding more tobacco/nicotine research than earlier decades and philanthropic organizations funding full centers of drug study (e.g., Johns Hopkins Center for Psychedelic Research). In combination, these changes introduce new opportunities and challenges for all stakeholders involved in the dissemination of science including challenges associated with navigating conflicts of interest. The aim of this scoping review and commentary is to provide an overview of existing research and policies addressing conflicts of interest. The review will tailor the lessons learned from each of these sources into specific recommendations and considerations for the field of substance use research.
Methods: Evidence was obtained from a search of the PubMed, Embase, and PsychInfo databases dated through 2019 (search terms: scientific integrity, conflict of interest, and research ethics). In addition, professional, regulatory, and governmental organizations (inside and outside the field of substance use) were searched for reports or guidance pertaining to conflicts of interest.
Results: Findings from the published literature revealed that most concerns over conflicts of interest have usually focused on the private sector; however, this has shifted in recent years as

other sources of bias have been shown to be equally influential (e.g., theoretical orientations of scientists, incentives from non-private funders, 'publish or perish' demands and academic incentives, use of 'spin' to publish research findings in scholarly and mass media outlets). Overall, the fields of environmental, nutritional, and general medical sciences have covered the topic of conflicts of interest/scientific integrity to a much greater extent than the field of substance use. Non-published resources (guidance documents, professional organization and publication standards) varied considerably in standards for conflicts of interest with some organizations greatly restricting who can present or publish scientific depending one funder, while others promoted participation across all stakeholders regardless of funder. Restrictive conflict of interest policies can ideally help to maintain scientific integrity by reducing the influence of special interests and imbalanced economic influence of stakeholders. However, costs associated with restrictive practices can be counterproductive including reduced diversity of thought and novel ideas, slowed innovation, and reduced access to non-traditional research funding.

Conclusions: There has been limited formal discussion across the broader field of substance use regarding the role of conflicts of interest in the conduct and communication of science. Recent news regarding the role of various stakeholder influences on the opioid crisis, as well as the shifting landscape of novel tobacco products (e.g., e-cigarettes), have made such discussions an urgent priority. CPDD has the opportunity to lead the field of substance use research into the 21st century by providing an outlet for formal discussions regarding best practices for managing conflicts of interest. Ideally such efforts would allow for constructive disagreement across all stakeholders given the complexity of this issue. This review provides a starting place for the broader discussion of scientific integrity in substance use research with a focus on conflicts of interest and proper ways to navigate their influence.

EVALUATION OF HUMAN ABUSE POTENTIAL (HAP) STUDIES FOR DRUGS WITH NOVEL MECHANISMS OF ACTION

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[1]US Food and Drug Administration

Abstract Detail: Human
Drug Category: Other, Regulatory
Topic: Other
Abstract Category: Theoretical/Commentary
Aim: To provide an overview of the human abuse potential (HAP) evaluation of drugs with novel mechanisms of action.

The abuse potential of a drug is considered a safety risk that needs to be evaluated as part of drug development. To this end, the Controlled Substance Staff (CSS) has issued guidance describing the accepted methodology and current scientific understanding of the abuse potential assessment of drugs, including HAP studies.

Methods: We revisited selected HAP studies reviewed by CSS for drugs with novel mechanism of action that did not generate strong signals predictive of abuse in animals.

Results: Need for a HAP evaluation of a drug is based on the identification of a positive signal in behavioral animal studies (e.g., drug discrimination and self-administration) or the occurrence of abuse-related adverse events in clinical trials, or both. A HAP study allows for the evaluation of subjective effects of the test drug relative to those of a drug with known abuse potential in a subject population with a history of recreational use of drugs with similar pharmacological profiles to that of the test drug. HAP studies are straightforward for drugs

with known abuse potential, such as opioids and stimulants, which show correlation between subjective effects and abuse of these drugs once on the market. However, for drugs with novel mechanisms of action (e.g., antiepileptics or orexin antagonists), for which no clear abuse-related behavioral responses in animals were demonstrated, the design of HAP studies and interpretation of study results becomes challenging.

Conclusions: An overview of the design and interpretation of HAP studies for several drugs with novel mechanisms of action indicates a potential of abuse of these drugs, despite a lack of positive signals in animal behavioral studies.

REACH PROGRAM DESCRIPTION

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Abstract Detail: Human
Drug Category: Other, All of the above
Topic: Substance Use Disorder
Abstract Category: Program Descriptions
Aim: REACH (Recognizing and Eliminating disparities in Addiction through Culturally-informed Healthcare), a 5-year SAMHSA funded initiative awarded to the American Academy of Addiction Psychiatry, aims to increase the number of racial and ethnic underrepresented minority (URM) leaders in Addiction Psychiatry and Addiction Medicine, earnestly dedicated to providing culturally-informed substance use treatment to URM populations with substance use disorders (SUDs).
Methods: To achieve this goal, REACH adopts a multi-modal approach, providing in-person and remote training about key structures in society that must be disassembled to prevent the perpetuation of health disparities in addiction, including ways to mitigate bias and the effects of structural and institutional racism. REACH engages key addiction thought leaders and researchers to provide practical instruction on best practices in taking care of racial and ethnic URM populations with SUDs. REACH Scholars are also supported in conducting original research, solely dedicated to improving health outcomes for URM populations who experience disparities in addiction. In addition to this training, financial support for independent research is provided, along with direct one-on-one mentorship, to ensure scholars pursue an effective career in addiction.
Results: Currently, 19 multidisciplinary scholars from across the nation are participating in REACH, with recruitment actively occurring for Year 2. Selected examples of original research from REACH scholars include understanding best practices for increasing MAT access for Black and Latinx patients and identifying key areas of need in improving linkage of URM patients with MAT upon re-entering society, after incarceration.
Conclusions: REACH is the first program of its kind, leading the way in increasing the number of racial and ethnic URM addiction specialists, well versed in clinical medicine and research. Through deliberate instruction in culturally-responsive treatment approaches, REACH scholars will not intentionally participate in the propagation of healthcare disparities in addiction.

CANNABIS AS A HARM REDUCTION APPROACH TO REDUCE THE USE OF TOBACCO, ALCOHOL, OPIOIDS AND OTHER DRUGS: A SYSTEMATIC REVIEW OF EVIDENCE

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Literature Review
Aim: To investigate the level of evidence supporting the use of cannabis as a tool to reduce the use of tobacco, alcohol, opioids and other drugs
Methods: A systematic review was conducted using the PRISMA-P guidelines. A search strategy was developed for each database to ensure exhaustive and comprehensive searching among five databases. Articles were included for review if they were peer-reviewed, published from 1996 to 2019, included cannabis as an exposure, and the outcome was the reduction of substance use.
Results: Search results produced 4,012 manuscripts for review of which 49 articles met all inclusion criteria. The 49 articles focused on tobacco (n=2), alcohol (n=6), opioids (n=16), illicit substances (e.g. meth, heroin, cocaine) (n=13) or a combination of substances (e.g. alcohol, tobacco, opioids and illicit substances) (n=12). The majority of the studies did not specify the type of cannabis being used (n=31). Studies that did not specify the types of cannabis show mixed results and overall low levels of evidence that cannabis is effective in reducing substance use. Studies that specifically focused on cannabidiol (CBD) showed a significant effect in reducing substance use (e.g. heroin, opioids, meth, cocaine, alcohol and tobacco) as well as cravings and withdrawal.
Conclusions: The level of evidence supporting the use of cannabis as a harm reduction tool for tobacco, alcohol, opioids, and other drugs varies greatly. Although CBD shows potential in being used as a harm reduction tool for substance abuse, current studies are limited to preclinical or small randomized control trials that did not examine the long-term effects CBD has on substance use.

ISSUES ON DESIGN AND STATISTICAL ANALYSIS FOR PHYSICAL DEPENDENCE STUDIES IN HUMANS

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Abstract Detail: Human
Drug Category: Other, CNS
Topic: Other
Abstract Category: Theoretical/Commentary
Aim: Physical dependence study evaluates whether chronic administration of a drug at therapeutic plasma levels produces a withdrawal syndrome upon drug discontinuation. The assessment of physical dependence in humans is usually assessed at the conclusion of a phase 2/3 clinical efficacy study through a monitored discontinuation period. When clinical efficacy studies with the test drug are conducted in a vulnerable population, or when abrupt

discontinuation of a test drug may pose a safety concern due to return of disease symptoms, a dedicated physical dependence study conducted in healthy controls may be recommended. Recently we reviewed several physical dependence studies in humans. We found many issues in these studies. For example, some physical dependence studies were add-ons to efficacy studies. Withdrawal population in these studies consisted of patients who did not enroll in an extension efficacy study for whatever reason (i.e., did not complete 12 weeks treatment, chose not to enter into the extension study, or did not fulfill eligibility criteria for the extension study). This withdrawal population resulted in 1) some patients not having enough exposure to the study medication, 2) some patients not even having a baseline for each withdrawal endpoint, and 3) most importantly, the study no longer being randomized. Another example was the issue of compliance in a physical dependence study using healthy subjects. Healthy subjects may not take study medications during non-clinic Maintenance Period, so the study results may not be reliable. This presentation discusses 9 issues found in recent physical dependence studies, and recommends that sponsors propose and justify all design elements of a physical dependence study in the protocol stage. It also recommends that sponsors study the ICH E9 (R1) "Statistical Principles for Clinical Trials: Addendum: Estimands and Sensitivity analysis in Clinical Trials" to determine the estimand for physical dependence study. For a given estimand, an aligned method of analysis, or estimator, should be implemented that is able to provide an estimate on which reliable interpretation can be based. The method of analysis will also support calculation of confidence intervals and tests for statistical significance.

Conclusions: Make recommendations for improving the design and statistical analysis for physical dependence studies in humans

ECONOMIC EVALUATION IN THE NATIONAL DRUG ABUSE TREATMENT CLINICAL TRIALS NETWORK: PAST, PRESENT, AND FUTURE

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Abstract Detail: Human
Drug Category: Other, literature review includes economic analyses of pharmacologic and behavioral interventions to treat drug use (including nicotine) as defined by NIDA's mission
Topic: Substance Use Disorder
Abstract Category: Literature Review
Aim: to identify, review, and summarize the evidence on 1) completed economic evaluations conducted as part of the National Drug Abuse Treatment Clinical Trials Network (NIDA CTN) protocols and 2) current economic analyses conducted alongside ongoing or planned NIDA CTN protocols
Methods: We conducted a systematic review of published and planned (ie, protocols for) CTN economic evaluations in the CTN dissemination library. For protocol results that have been published, we used a comprehensive quality checklist, the Drummond Checklist, to evaluate the quality and methodological rigor of each economic study.
Results: We identified 78 published articles and 138 ancillary, follow-up, and original protocols that referenced health economic search terms. We identified 11 published articles and 14 protocols (6 completed, 2 active, and 6 in development as of September 25, 2019) that included an economic evaluation.

Conclusions: We identified the growth and improvements in the quality of CTN economic evaluations over time and highlighted use of methodological best practices.

SOCIOECONOMIC INEQUALITIES AND DRUG USE DISORDERS: CURRENT KNOWLEDGE AND FUTURE DIRECTIONS FOR RESEARCH AND ACTION

Elizabeth Sáenz*[1], Gilberto Gerra[1], Giovanna Campello[1], Anja Busse[1], Wataru Kashino[1]
[1]*United National Office on Drugs and Crime*

Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Program Descriptions
Aim: Drug use disorders (DUDs) are multi-factorial and often follow the course of a relapsing and remitting chronic disease. Socio-economic conditions play a fundamental role in drug use and DUDs, with poverty and limited education increasing the risk of DUDs and worsening their consequences.
Strengthening prevention and treatment for people with DUDs is a demand reduction strategy of significant public health importance and a cornerstone of the 2016 United Nations General Assembly Special Session on the World Drug Problem (UNGASS) outcome document and has been set as Target 3.5 of Goal 3, under the 2030 Agenda for Sustainable Development Goals.

The aim of this initiative is to better understand and communicate the role of social inequalities in health, especially with regard to drug use and access to effective treatment in low- and middle-income countries, and to tailor and guide strategies to address DUDs amongst the socioeconomically disadvantaged.

Conclusions: Scientific evidence shows that social inequalities of health are linked to DUDs. Socioeconomic inequalities play a fundamental role in the behavioural and mental development. This is why the World Health Organization Commissioner on Social Determinants of Health recommended that all policies should be evaluated in terms of their impact on social inequalities and health.
Studies show that children growing up in low-income families typically complete less schooling, report worse health, and work and earn less in adulthood compared with their higher-income counterparts. Numerous studies also highlight that a lower socioeconomic status tends to go hand in hand with a higher prevalence in drug use, whereas young people from high socioeconomic status dispose of greater sociocultural resources to master and regulate their consumption pattern.

The UNODC Prevention, Treatment and Rehabilitation Section is embarking on developing a paper on socioeconomic inequalities and DUDs, based on input provided by the UNODC Informal Scientific Network.

RESEARCH TRAINING FOR ADDICTION MEDICINE AND ADDICTION PSYCHIATRY FELLOWS – THE RESEARCH IN ADDICTION MEDICINE SCHOLARS (RAMS) PROGRAM

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Abstract Detail: Human
Drug Category: Other, Addiction
Topic: Other
Abstract Category: Program Descriptions
Aim: To address clinical substance use problems, addiction medicine (AM) was established as a new discipline in 2008 and became a subspecialty addressing substance use in addition to addiction psychiatry (AP) in 2016. The Research in Addiction Medicine Scholars (RAMS) Program was established to promote research training of physicians in AM and AP fellowship programs with the support of NIDA R-25 funding. The RAMS program bolsters scholars' fellowship training by providing support from local and national mentors for research projects, career mentoring and participation at national addiction conferences. Outcomes of the RAMS scholars from 2012-2018 are described.
Methods: The RAMS program consists of a two-year cycle where scholars attend a 4-day Boston retreat and the College on Problems of Drug Dependence (CPDD) meeting in which there are research-oriented activities, career path discussions, didactic seminars and skill-building sessions. Fellows also participate in monthly webinars and receive funds for implementation of a mentored research project. Scholars' training background and sociodemographic features were collected; a PubMed search for addiction medicine publications was conducted on RAMS alumni, noting R25 grant citations. Surveys and online searches were used to assess career awards post-RAMS program.
Results: Over five cycles (2012-2018), the RAMS Program supported 24 scholars (13 AM fellows, 11 AP fellows). Scholars are 62% female (n=15) and 12% Hispanic (n=3). Over a quarter (29%) of scholars received a research career development award since program completion (n=7). Scholars had a total of 201 publications focused on substance use; 40% (n=82) were as first author and 15% (n=30) as senior author.
Conclusions: The RAMS Program provides experiences and mentorship to help launch successful addiction physician clinical investigator research careers.

DEVELOPMENT OF A CORE OUTCOME SET FOR TREATMENT OF SUBSTANCE USE AND ADDICTIVE BEHAVIOUR DISORDERS: A MULTI-DISCIPLINARY, MIXED-METHODS APPROACH

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¹National Drug and Alcohol Research Centre, ³International Consortium on Health Outcome Measurement

Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Treatment
Abstract Category: Theoretical/Commentary
Aim: Aims: To develop a standardised minimum set of outcome measures that (1) can be implemented globally across intervention settings for substance use and addictive behaviour disorders, and (2) assess those outcomes that are most important to those who access these treatments.
Methods: Structured teleconference calls are conducted with an international, multidisciplinary Working Group of 26 leading experts in the substance use and addictive behaviour field—including healthcare professionals, researchers, outcome measurement

experts, and service-user representatives—who were assembled by the International Consortium for Health Outcome Measurement (ICHOM). Calls follow a progression of planned themes designed to achieve consensus on the scope of the Standard Set and the outcome domains, outcome measures, and relevant case-mix variables to be included in the Standard Set. To support the calls, we generated evidence through a systematic review of outcome domains, measures, and case-mix variables, a scoping review of related grey literature and existing measurement initiatives, and advisory groups with service-user representatives and experts. Agreement is reached through a modified Delphi approach.

Results: The Working Group have defined the scope of the work to include disorders of smoking, alcohol, drugs, gambling, and gaming, amongst people aged 12 years and older. The included outcome domains are quantity-frequency, symptom burden, health-related quality of life, global functioning, psychosocial functioning, overall mental health and wellbeing, and overall physical health and wellbeing. By the time of the CPDD conference, the measures, and case-mix variables will also be finalised.

Conclusions: Implementation of the Standard Set will facilitate shared decision-making, quality improvement, and cost reductions.

Comorbidities, Medical

NEUROCOGNITIVE DIFFERENCES IN ANXIOUS AND DEPRESSED CANNABIS USERS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Behavior
Abstract Category: Original Research
Aim: To characterize the influence of cannabis use on cognitive functioning in anxious/depressed individuals. We hypothesized that anxious/depressed cannabis users would exhibit lower cognitive functioning relative to similar cannabis-naive individuals.

Methods: N=41 were selected from a larger naturalistic study ("Tulsa 1000 Study") for having any lifetime mood and/or anxiety disorder and problematic cannabis use (lifetime cannabis use dependence (DSM-IV) or more than 50 past year cannabis uses; "Mood+CB"). Propensity-score-matching identified 41 individuals with similar internalizing symptoms and licit drug use, but low-levels of cannabis use ("Mood-CB"). There was an equal number of males and females per group.

Participants completed the UPPSP Impulsivity, California Verbal-Learning Test ("CVLT"), and Color-Word Interference Task ("CWIT"), which quantified performance on a set of neurocognitive subscales (domains), while the Digit-Span tasks ("DST") tested one domain. Mixed effects models estimated group-by-domain interactions for Impulsivity, CVLT, and CWIT. Analysis of covariance was used for the DST. Marginal means were calculated to probe the nature of significant interactions.

Results: A significant interaction was identified for impulsivity (F=3.1 p<.05), CVLT (F=2.2, p<.05), and CWIT (F=1.9, p<.05), while a main effect of group was identified for DST (F=4.4, p<.05). Marginal means indicated higher lack of premeditation (impulsivity) in the Mood+CB group (M=24.3, SE=1.0) relative to Mood-CB (M=19.6, SE=1.4) (t=2.65, p<.05). Long delay

recall (CVLT) was lower in the Mood+CB group (M=47.9, SE=.42) relative to Mood-CB (M=51.4, SE=.60)(t=4.7,p<.05). Color word reading (CWIT) was lower in the Mood+CB group (M=76.2, SE=2.1) relative to Mood-CB (M=89.9, SE=3.1). Digit span was lower in the Mood+CB group (M=9.3, SE=.35) relative to the Mood-CB group (M=10.3, SE=.39) (t=1.1, p<.05). Post-hoc correlations revealed higher past year cannabis use was related to lower color word reading (r=-.37, p< .05).

Conclusions: Cannabis is related to a constellation of behavioral and cognitive deficits putatively involved in maintaining both mood and cannabis use disorders.

BARRIERS TO TREATMENT LINKAGE AMONG PEOPLE WITH COMORBID SUBSTANCE USE AND HIV

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[1]*University of Texas at Austin Dell Medical School*

Abstract Detail: Human
Drug Category: Other, All substances listed
Topic: Treatment
Abstract Category: Original Research
Aim: Linkage to a) substance use (SU) treatment for people living with HIV (PWLH) and b) HIV care for people who use drugs (PWUD) remains a significant public health concern. HIV and SU interact synergistically to exacerbate disease progression and contribute to poorer engagement in HIV and SU treatment. There is a lack of qualitative research exploring the real-world complexity behind community-level and organizational-level barriers that affect patients' linkage to both SU and HIV care.
Methods: Our qualitative analysis used emergent data from a larger HIV treatment study to explore clinician perspectives on PLWH's linkage to substance use (SU) care and vice versa. Data from semi-structured individual interviews with 16 HIV and 13 SU clinicians (N=29), recruited in New England in 2015, were analyzed using thematic analysis.
Results: Overall, four themes emerged as barriers to linkage to either SU or HIV care: 1) providers limited knowledge with appropriate referrals; 2) shortage of SU/HIV care centers within the community; 3) difficult admission criteria to SU facilities (e.g. patient should be in withdrawal phase to get admitted to a detox center); and 4) communication challenges between providers at different organizations (e.g. hierarchy of the providers is a challenge for referral). The idea of "one stop shopping" (service co-location) and technology-based solutions emerged as facilitators to treatment linkage.
Conclusions: These results highlight the need for clinician-level and systems-level interventions to improve linkage to care for highly vulnerable patient populations. Structural barriers hinder patients receiving the proper treatment they need. Interventions that increase provider cross-training in HIV and SU, reduce barriers to treatment admission (e.g., organizational requirements, waitlists), and reduce power differential to improve communication across clinicians are needed.

IMPACT OF PERI-HOSPITALIZATION INITIATION OF MEDICATIONS FOR OPIOID USE DISORDER AMONG PERSONS WITH SKIN AND SOFT TISSUE INFECTIONS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: Skin and soft tissue infections (SSTI) are common complications of injection drug use. Inpatient initiation of medications for opioid use disorder (MOUD) may improve outcomes for this population. We investigated whether overdose and rehospitalization differ among persons with OUD hospitalized for SSTI who are initiated on MOUDs and those who are not.
Methods: We analyzed a cohort of commercially insured individuals aged 18-years and older with OUD who were hospitalized for SSTI between 2010 and 2017. The primary outcome measures included 30-day overdose and 30-day and one-year all-cause rehospitalization. The main independent variable was receipt of MOUD within 30 days of index SSTI hospitalization. We calculated the incidence rates of the primary outcomes for each group. We developed Cox proportional hazards models to predict time from hospital discharge to each of the primary outcomes as a function of MOUD receipt. Models controlled for covariables including age, sex, co-occurring substance use disorder, and surgical intervention.
Results: The cohort included 7954 individuals (mean age was 38 years [SD + 14.5], 47% female). Approximately 14% received MOUD in the 30 days following their index SSTI hospitalization. The MOUD group was more likely to have another substance use disorder than the no MOUD group and was also less likely to receive surgical intervention. The unadjusted incidence of 30-day and 1-year rehospitalization were lower in the MOUD group compared to no MOUD (24.5 vs 28.1 per 100 person-month and 146.8 vs 193.7 per 100 person-years, respectively). In multivariable models, the hazard of rehospitalization at both time points was lower for MOUD than for no MOUD (adjusted hazard ratio (aHR)=0.85, 95% CI 0.73,0.98; aHR=0.74, 95% CI 0.67,0.81, respectively). There was no statistically significant difference in 30-day overdose between the groups (aHR=0.76, 95% CI 0.39,1.49).
Conclusions: MOUD receipt following SSTI hospitalization decreases rehospitalization among persons with OUD.

HUMAN PLASMA MICRORNAS AS MEDIATORS OF HIGH RATES OF SUICIDALITY AMONG SMOKERS

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[1]*Baylor College of Medicine*

Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Behavior
Abstract Category: Original Research
Aim: We examined plasma microRNAs as mediators of the association tobacco smoking with suicidality.
Methods: We examined microRNA content in the plasma of 66 psychiatric inpatients, 40 with suicidal ideation (SI) and 26 without (nSI), as assessed using the Columbia-Suicide Severity Rating Scales. We used total plasma RNA for library prep, miRNA-seq and FastQC after excluding non-adapter readers. The miRDeep2 package identified novel and known microRNAs and DESeq2 detected microRNA differences between SI and nSI groups.
Results: Nine microRNAs showed dysregulation in patients with suicidal ideation. Seven microRNAs, including hsa-miR-23b-5p, hsa-miR-542-3p, hsa-miR-193a-5p, hsa-miR-450b-

5p, hsa-miR-3679-5p, hsa-miR-424-5p, and hsa-miR-125a-3p were downregulated and two microRNAs, hsa-miR-106b-3p and hsa-miR-1299 were upregulated. Online target gene prediction webtools (targetscan, miRDB) identified target gene lists for each miRNA. Functional annotation analysis (FAA) using DAVID (https://david.ncifcrf.gov/summary.jsp) associated these target genes with GO (gene ontology), KEGG pathway, tissue, and diseases.

Conclusions: FAA results suggested that brain is the main target tissue of these microRNAs, and KEGG pathway analyses indicated that the relevant target genes of these microRNAs are associated with psychiatric disorders and predominantly with nicotine use disorder. Thus, the brain effects of nicotine dependence on suicidality may act through microRNAs. Furthermore, plasma microRNAs might serve as biomarkers to aide in objective screening for prediction of suicide risk among smokers. Additional studies with qPCR using new cohorts are underway to validate these preliminary findings, and we are analyzing repeated microRNA samples from recovered suicidal patients to correlate any microRNAs changes with recovery.

EXAMINING THE EFFECTS OF ALCOHOL USE ON SMOKING CESSATION OUTCOMES IN CANCER PATIENTS: SECONDARY ANALYSIS OF THE SMOKEFREE SUPPORT STUDY

Joanna Streck*[1], Kelly Hyland[2], Colin Ponzani[1], Alona Muzikansky[1], Susan Regan[1], Jamie Ostroff[3], Elyse Park[1]*

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Treatment
Abstract Category: Original Research

Aim: Among people with cancer, there is evidence that alcohol and tobacco dual use can decrease quality of life, lead to the development of secondary tumors and increase risk for mortality and other psychopathology. Most smoking cessation clinical trials have excluded individuals with alcohol use disorder (AUD). As no prior studies have investigated whether alcohol use may negatively impact smoking cessation outcomes in cancer patients, we aimed to investigate this question.

Methods: This is a secondary analysis of data from the Smokefree Support Study, a two-site randomized controlled trial examining the efficacy of Intensive (IT; n=153) vs. Standard Treatment (ST; n=150) for smoking cessation in newly diagnosed cancer patients. All patients were offered 4 weeks of counseling and pharmacotherapy recommendations. IT patients were offered an additional 7 counseling sessions and pharmacotherapy at no cost. AUD was assessed at baseline using the 4-item CAGE questionnaire with total scores >2 considered clinically significant. Weekly frequency of alcohol use and binge drinking (>4 drinks/occasion) among alcohol users was also assessed. The parent trial primary outcome was cotinine-confirmed cigarette abstinence at 6-months.

Results: At baseline, patients were on average, 58 years old, 56% female, and smoked a mean of 14 cigarettes/day. Among those reporting alcohol use (46%), patients drank on average 9 drinks/week, 15% reported binge drinking and 10% met criteria for AUD. In multivariable models adjusting for study treatment group, AUD (vs. no AUD) was not significantly associated with biochemically-confirmed 6-month tobacco abstinence, nor was current binge drinking (vs. absence of binge drinking) (all p's>.05).

Conclusions: Our data suggest that problematic alcohol use at baseline does not negatively impact smoking cessation outcomes in newly diagnosed cancer patients. Smokers with AUD and cancer may benefit from smoking cessation interventions at the time of cancer diagnosis. Implications for a multiple risk factor treatment approach are discussed.

Comorbidities, Psychiatric

IS THERE AN ASSOCIATION BETWEEN CIGARETTE SMOKING AND ADVANCED LIVER FIBROSIS IN HIV-INFECTED HEAVY DRINKERS?

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Abstract Detail: Human
Drug Category: Alcohol
Topic: HIV/Immune
Abstract Category: Original Research
Aim: Cigarette smoking has been associated with liver fibrosis in the setting of hepatitis C, but has not been studied among HIV-infected individuals who consume alcohol.
Methods: Cross sectional study of baseline data in the St PETER study, a trial of smoking cessation among HIV-infected heavy drinkers in Saint Petersburg, Russia. The primary independent variable was the mean number of cigarettes smoked per day (cpd) in the past 30 days, and the secondary independent variable was pack-years at study entry. Both smoking variables were categorized into tertiles. Advanced liver fibrosis, the outcome, was defined as a fibrosis-4 (FIB-4) value >3.25. Analyses were conducted using multiple logistic regression models adjusted for sex, body mass index (BMI), number of heavy drinking days, HCV infection and CD4 count.
Results: Participants (n=333) in this cohort were mostly male (67.3%), young (mean age of 38 +/-6.2 years), lean (mean BMI of 22.1 +/-3.1), infected with HCV (83.5% HCV antibody positive) and not immune suppressed (median CD4 count 357). The mean number of heavy drinking days past month was 9.7 +/-6.0. The mean number of past-month cpd was 21.3 +/-8.3 and the mean pack-years was 25.8 +/-13.0. The prevalence of advanced liver fibrosis was 11.4% (38/333).

In the adjusted logistic regression analysis we did not observe a significant association between cigarettes per day [middle (20.0-20.9 cigarettes) vs. lowest (6.0-19.3 cigarettes) tertile (adjusted odds-ratio [aOR] (95% Confidence Interval [CI]): 0.97 (0.41-2.29), highest (21.3-50.0 cigarettes) vs. lowest tertile aOR (95% CI): 0.66 (0.26-1.67), global p-value=0.62]. The secondary analysis with pack-years yielded similar results [middle (19.0-28.5 pack-years) tertile aOR (95% CI): 0.81 (0.33-1.99), highest tertile (28.8-87.5 pack-years) aOR (95% CI): 0.91 (0.38-2.19); global p-value=0.90].

Conclusions: In this Russian cohort of HIV-infected heavy-drinking daily smokers, we did not detect an association between recent cigarette use or mean pack-years and advanced liver fibrosis.

CAN CHILDHOOD ADHD SYMPTOMS PREDICT PROGRESSION OF PROBLEMATIC ALCOHOL AND SUBSTANCE USE IN A DIVERSE COLLEGE SAMPLE?

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Abstract Detail: Human
Drug Category: Alcohol
Topic: Other
Abstract Category: Original Research
Aim: Childhood Attention-Deficit/Hyperactivity Disorder (ADHD) increases risk for alcohol and substance use in adolescence/early adulthood, with earlier initiation and more rapid escalation to regular use than their non-ADHD peers. In general, college is a period characterized by elevated rates of problematic drinking and substance use. However, those with a history of childhood ADHD represent a uniquely vulnerable population; studies suggest worse consequences following alcohol consumption than for non-ADHD peers. This study explores childhood ADHD symptoms and adult alcohol and substance use in a diverse urban sample of full-time college students.
Methods: As part of an ongoing two-part study, we present preliminary data from a diverse sample (only 16.6% identified as white) of full-time undergraduate college students aged 18-25 (N=633), attending a large, urban college in the North Eastern US. Participants completed an online survey comprising background demographics questionnaire, questions about childhood ADHD symptoms (WURS), and alcohol (AUDIT) and drug use in the past year (DUDIT). Scores on the WURS and AUDIT were dichotomized into High and Low. Chi-square analyses were used to compare categorical variables.
Results: Students from this commuter college (93.5% lived off-campus) were grouped based on High (>36; N=113)/Low (<36, N=520) scores of childhood ADHD symptoms (WURS). Those with High WURS scores were more likely to have ever had a full drink of alcohol ($X^2(1)=5.02$, p=.025), at an earlier age ($X^2(2)=10.57$, p=.005), and progress to regular use ($X^2(1)= 6.63$, p=.010) than Low WURS peers. Similarly, the High WURS group were also more likely to have ever used a drug ($X^2(1)=26.57$, p=.0001), at an earlier age ($X^2(2)=9.64$, p=.008), and progress to regular use ($X^2(1)=5.17$, p = .023) than their peers.
Conclusions: These preliminary findings support published data on childhood ADHD symptoms and alcohol and substance use risks in college-aged students, in a uniquely diverse sample of commuter college students.

DOES USING PRESCRIPTION OPIOIDS NONMEDICALLY CONTRIBUTE TO THE INCREASE IN SUICIDALITY AMONG MALE AND FEMALE ADOLESCENTS IN THE UNITED STATES? NSDUH 2015-2017

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Abstract Detail: Human
Drug Category: Opiates/Opioids

Topic: Sex Differences
Abstract Category: Original Research
Aim: In 2017, 6,769 adolescents and young adults died by suicide in the United States (US), making suicide the second leading cause of death after unintentional injury in this age group. To date the drivers of recent increases in suicides remain elusive. We examined the relationship between nonmedical prescription opioid (PO) use and suicidal ideation/attempts in US adolescents.
Methods: Using 2015-2017 US National Survey on Drug Use and Health data (N=41,579), we estimated the association between past-year (PY) nonmedical PO use and PY suicidal ideation/attempts in adolescents ages 12-17 overall and by sex. We estimated survey-weighted prevalence ratios (aPR) using modified Poisson regression adjusted for sex, race/ethnicity, urbanicity, survey year, past-month binge/heavy alcohol use, PY other illicit substance use, and receipt of PY mental health services for behavioral/emotional problems not caused by alcohol or drugs.
Results: Overall, the prevalence of suicidal ideation and attempt increased from 14.4% in 2015 to 15.4% in 2017 and from 3.4% in 2015 to 4.0% in 2017, respectively. Suicidal ideation and attempt among adolescents using PO nonmedically was 21.0% in 2015 and 23.8% in 2017, and 6.28% in 2015 and 9.24% in 2017. Overall, the prevalence of suicidal ideation and attempt was 1.33 (1.17–1.52) and 1.67 (1.29–2.16) times higher for adolescents using PO nonmedically than those who did not. The prevalence of suicidal ideation/attempt increased from 10.2% in 2015 to 12.0% in 2017 among males using PO nonmedically, and from 30.9% in 2015 to 34.2% in 2017 among females using PO nonmedically. In each year, the prevalence of suicidal ideation and attempt were higher for males (1.15[1.07–1.24] and 1.27[1.09–1.47]) and females 1.13 [1.09–1.18] and 1.34[1.23–1.46]) using PO nonmedically compared to those who did not.
Conclusions: Findings provide initial insights into the potential role of nonmedical opioid use in suicidality among male and female adolescents.

DRUG USE CORRELATES OF SUICIDAL BEHAVIORS AMONG COLLEGE-AGED INDIVIDUALS IN THE UNITED STATES: RESULTS OF THE NATIONAL SURVEY ON DRUG USE AND HEALTH 2015 - 2018

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research
Aim: The average life expectancy in the US has declined for a third straight year, with suicide and drug overdose among young Americans contributing to fuel the observed decline. This study aims to estimate the past-year prevalence and drug use correlates of suicidal behaviors among college-aged individuals in the United States.
Methods: Data from 33,587 individuals 18 to 22 years old surveyed in the 2015-2018 National Study on Drug Use and Health (NSDUH) were included in the analyses. Descriptive and multinomial regression models were conducted to estimate the prevalence and drug use correlates of suicidal behaviors (i.e., serious suicidal thoughts, suicidal plans, and suicidal attempts). NSDUH analysis weights were applied to accommodate for the sampling design.
Results: Overall, 5.4% (95% C.I.= 5.0%, 5.8%) reported serious suicidal thoughts, 1.9% (95% C.I.= 1.7%, 2.2%) suicidal plans, and 2.7% (95% C.I.= 5.0%, 5.8%) suicidal attempts, although

rates varied by college enrollment status and drug use patterns. Relative to individuals who did not report any suicidal behaviors, those with a past-year diagnosis of nicotine dependence (aIRR = 2.2, 95% CI = 1.6, 2.9), cannabis use disorder (aIRR = 2.1, 95% CI = 1.6, 2.8), and prescription analgesics use disorder (aIRR = 5.7, 95% CI = 3.5, 9.4) were more likely to report a past-year suicidal attempt than those who did not use these drugs.

Conclusions: Drug use and use disorders are highly prevalent among college-aged individuals who reported any past-year suicidal behavior. Rates of suicidal behaviors varied by college enrollment status and drug use patterns. This study contributes to identify at-risk groups for intervention design.

DIFFERENCES IN MENTAL HEALTH AND SUBSTANCE USE RISK PROFILES BETWEEN CANNABIS-ONLY USERS AND POLYSUBSTANCE CANNABIS USERS IN A NATIONAL SAMPLE

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research

Aim: The majority of nonmedical cannabis users engage in polysubstance use (i.e., combination of nonmedical cannabis and one or more substances used concurrently). However, research has largely focused on outcomes associated with cannabis without fully considering the impact of polysubstance use patterns (Hall, 2015). We examined demographic characteristics associated with cannabis users reporting only cannabis use and cannabis-related polysubstance use patterns, including differences in rates of cannabis use disorder (CUD).

Methods: This study used the 2015-2017 National Survey on Drug Use and Health (NSDUH) data, which employed an independent, multistage area probability sample to produce nationally representative data, including 31,325 individuals reporting past-year cannabis use. Multinomical logistic regression was used with both sexes included in analyses.

Results: Being 26-34 years old (RRR=3.16, ps<.001) and having a college degree (RRR=2.18 p<.01) was associated with greater risk of past-year cannabis, alcohol, and tobacco polysubstance use (n=18,581) compared to cannabis use only (n=1244). Being 35-49 years old (RRR=11.85, p<.001) and having past-year suicidal thoughts (RRR=1.58, p<.05) was associated with cannabis and tobacco use (n=1713) compared to cannabis use only. Black race, living in a medical marijuana state, and having ever received substance use disorder treatment was associated with reduced risk of being in a cannabis polysubstance use group (ps<.05). Furthermore, compared to those engaging in cannabis use only, past-year cannabis, alcohol, and tobacco use and past-year cannabis and tobacco or cannabis and other illicit drug or prescription drug misuse (n=201) had higher odds of past-year CUD (ORs 2.30-4.44, ps<.05).

Conclusions: Findings suggest that those who engage in cannabis-related polysubstance use have differing demographic characteristics and risk profiles compared to those who engage in cannabis use only and may confer differential risk for CUD. These results highlight the importance of considering cannabis-related polysubstance use when screening and the need to further explore these patterns associated with cannabis use.

CORRELATES OF MENTAL HEALTH DISORDERS IN PEOPLE WHO INJECT DRUGS (PWID)

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research

Aim: People who inject drugs (PWID) face elevated risk for a wide range of adverse health outcomes including infectious diseases and premature mortality. Comorbid mental illness is common among PWID; however, there is little scientific evidence available to inform health service providers about the relationship between comorbid mental health disorders and drug use patterns, sexual behaviors, and demographic characteristics among PWID. The aim of the current article is to examine the association between mental health disorders and recent risk behaviors among a large sample of PWID.

Methods: Los Angeles and San Francisco PWID (N=535) were recruited using targeted sampling methods and interviewed during 2017-2018 as part of a larger RCT evaluating a behavioral intervention to reduce injection initiation behaviors. Logistic regression models were used to examine correlates of people who reported a past diagnosis of depression (n=73), bipolar disorder (n=37), anxiety (n=53), schizophrenia (n=27), and PTSD (n=34), separately.

Results: Recent major mental health disorder diagnosis (within the last 12 months) was reported by 19.6% of the sample. In logistic regression analysis, PWID with depression and anxiety were more likely to report recent heroin use within the past 30 days compared to those without depression and anxiety. PWID with bipolar disorder were more likely to have casual sex partners within the past 6 months. PWID with schizophrenia were more likely to be male and report recent opiate use within the past 30 days. Lastly, PWID with PTSD were more likely to be >50 years old, have paying sex partners, and report recent crack and tranquilizer use within the past 30 days.

Conclusions: PWID with different comorbid psychiatric disorders have unique and significant health outcomes, drug use patterns, demographic characteristics, and risk reduction needs. Self-reported mental health history may be an effective tool for identifying particularly high risk people within injection drug using populations.

CANNABIS, NUTRITION INTAKE, AND METABOLISM: AN EVOLVING STATE OF SCIENCE

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Behavior
Abstract Category: Literature Review

Aim: Cannabis is associated with higher caloric intake and is postulated to impact metabolism through the endocannabinoid system. Yet, there is a gap in knowledge regarding the independent and combined impact of cannabis use and nutrition on metabolism. The aim of

this study was to describe the state of the literature with respect to the impact of cannabis use and nutrition on metabolism.

Methods: A MEDLINE and Google Scholar search of publications was conducted during October and November 2019. Articles were examined by 2 independent reviewers to confirm inclusion criteria: (1) examined cannabis (marijuana), nutrition intake, body mass index (BMI) and/or metabolism and (2) published between 2001-2019. Case studies and case series were excluded.

Results: Initial searches yielded 97,560 results (cannabis effect on endocannabinoid system, n = 22,600; cannabis usage and BMI, n = 11,300; cannabis as a weight regulator, n = 10,500; cannabis users and lower BMI explanation, n = 10,800; cannabis, metabolism, weight regulator, n = 11,400; cannabis, nutrition, weight, BMI, n = 4,760; BMI and marijuana, n = 13,800; BMI and cannabis, n = 12,400). Of the 15 studies that met inclusion criteria, 3 were preclinical, 4 were cross-sectional, 5 were cohorts, and 3 were randomized control trials. There was a consensus among studies that cannabis users have a lower BMI and higher caloric intake than non-users. There is currently equipoise on its effect on metabolism, though preclinical studies suggest the mechanism of action includes specific components within cannabis (cannabinoids) interacting with the cannabinoid receptor 1 within the endocannabinoid system.

Conclusions: Limited studies examine metabolism within the context of cannabis and nutritional intake. Increasing evidence suggests cannabis is a weight regulator, especially among HIV and cancer patients seeking to gain weight; however, among healthy community samples, consistent evidence shows a significantly lower BMI among cannabis users than non-users.

A LOOK BEYOND THE TIP OF THE ICEBERG: A NARRATIVE REVIEW ON COMORBID PSYCHIATRIC DISORDERS IN ADOLESCENTS WITH METHAMPHETAMINE USE DISORDER

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Adolescent
Abstract Category: Literature Review

Aim: Methamphetamine use and Methamphetamine disorders (MUDs) including abuse, misuse, and dependence frequently start in adolescence. Adolescents with MUD rarely present themselves in the clinical setting with MUD only. Mostly, other psychiatric or mental disorders existed before the MUD or in parallel with it. Up to now, no comprehensive review was available about MUD and comorbid disorders in adolescents, including potential mechanisms of comorbidity and the relevance to treatment. We thus aimed to review the literature that either assessed these relationships adolescents, or retrospectively evaluated them for this age group.

Methods: A PubMed search for articles reporting on MUD and comorbid mental disorders published through July 2019 was conducted. Relevant comorbidities were defined as attention-deficit disorder with or without hyperactivity, anxiety disorders, depression, eating disorders, post-traumatic stress disorder, psychosis, borderline personality disorder, conduct disorder and antisocial personality disorder, as well as other substance use disorders. For each of these comorbidities, we abstracted and summarized specific prevalence rates, early findings on the comorbidity mechanisms, and recommend treatment options, if applicable.

Results: Few identified articles focused on MUD in adolescents. Prevalence rates differed largely between comorbid disorders, with tobacco use disorder and conduct disorder being the most prevalent comorbidities while eating disorders are rare. Underlying onset patterns and comorbidity mechanisms are rarely examined, nonetheless indicating three groups of comorbidities: pre-existing disorders that are self-medicated with methamphetamine, disorders that are induced by chronic methamphetamine use, and disorders that arise likely due risk factors they share with MUD. Most reviewed comorbidities are associated with worse treatment outcomes, underlining the need for integrated treatment modules in standard SUD therapy.

Conclusions: The presumably high prevalence and relevance of comorbid mental disorders for treatment and outcomes is in strong contrast to the limited evidence base. Surprisingly few treatment programs for MUD in adolescents explicitly integrate the treatment modules for comorbid mental disorders. We argue that the concept of treating either MUD or comorbid conditions in child psychiatric institutions needs to be reconsidered.

SUBSTANCE USE FACTORS ASSOCIATED WITH HOMELESS SHELTER ENTRY: A LONGITUDINAL ANALYSIS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Prevention
Abstract Category: Original Research
Aim: To examine the longitudinal association of substance use with becoming homeless among emergency department (ED) patients. We hypothesized future homeless shelter entry would be significantly associated with specific drug use characteristics, including drug use severity.

Methods: We conducted interviews with a random sample of New York City (NYC) public hospital ED patients who screened positive for past year unhealthy alcohol or drug use. Adult patients were eligible if they spoke English/Spanish, were medically stable, and not in prison/police custody. Data were linked to NYC shelter administrative databases. We conducted bivariate and multivariable analyses to examine the association of patients' baseline substance use with becoming homeless as measured by shelter entry within the next 12 months, among patients who were not homeless at baseline; nearly all homeless persons in NYC are sheltered.

Results: Among 1,286 ED patients with unhealthy alcohol or drug use who were not homeless at baseline, 120 (9.3%) entered a shelter in the next 12 months. Shelter entry occurred in 10.7%, 21.9%, 29.6%, and 42.4% of patients who reported any cannabis, cocaine, heroin, and synthetic cannabinoid use, respectively. Higher DAST-10 scores were associated with stepwise increased prevalence of future shelter entry (4.5%, 6.5%, 16.3%, 28.8%, and 40.9% for DAST-10 scores 0, 1–2, 3–5, 6–8, and 9–10, respectively). In the fully adjusted multivariable model, DAST-10 score 9–10 remained significantly associated with future shelter entry (aOR 4.42, 95% CI 1.03–19.01).

Conclusions: Findings from this longitudinal research reflect the heterogeneity in relationships between drug use and homelessness, while also shedding new light into drug use severity as a

contributor to homelessness. These insights can be used to inform ED-based substance use and homelessness prevention interventions.

THE IMPACT OF CANNABIS USE DISORDER ON COMORBIDITIES, FUNCTIONING, AND SUICIDALITY IN A NATIONALLY-REPRESENTATIVE SAMPLE OF U.S. VETERANS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research
Aim: Cannabis use has been associated with a number of adverse consequences. Epidemiological research has examined demographic and psychiatric correlates of cannabis use disorder (CUD) among the general population, but relatively little is known about these rates among veterans, especially those who do not utilize Veterans Affairs Health Care services. To understand the burden of CUD among the greater veteran population, this study evaluated the prevalence of CUD and its psychological, functional, and quality of life correlates.
Methods: Data were analyzed from the National Health and Resilience in Veterans Study (NHRVS), a web-based survey of a nationally-representative sample of 3,157 U.S. veterans. Analyses estimated the prevalence of cannabis never-users and those with CUD as defined by DSM-IV criteria; compared demographic and military variables by cannabis use status; and examined associations between cannabis use status and suicidality, functioning, substance use co-occurrence, and psychiatric comorbidities.
Results: Weighted statistical analyses indicated that the prevalence of cannabis never-users was 71.9%, lifetime users without CUD was 21.9%, and those with CUD was 7.1%. Significant differences among these groups were detected with respect to age, race, marital status, employment status, and enlistment status. Controlling for these differences, results of multivariable models revealed that, compared to veterans with no cannabis use, those with CUD were more likely to have co-occurring PTSD (OR=3.56, CI=2.38, 5.30 $p < 0.001$), depression (OR=3.93, CI=2.86, 5.39, $p < 0.001$), anxiety (OR=4.56, CI=2.74, 7.58 $p < 0.001$), alcohol use disorder (OR=22.4, CI=14.0, 35.6, $p < 0.001$), and to have attempted suicide in their lifetime (OR=3.53, CI=2.28, 5.47, $p < 0.001$). Effect sizes were small on measures of mental ($d = 0.20$) and physical functioning ($d=0.20$), and quality of life ($d = 0.20$).
Conclusions: Results provide a population-based characterization of the burden of CUD comorbidity in U.S. veterans. Findings underscore the importance of screening and monitoring for CUD, and engaging these veterans in treatment.

SOCIAL DETERMINANTS OF SMOKING IN PATIENTS ELIGIBLE FOR CARDIAC REHABILITATION

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Behavior
Abstract Category: Original Research
Aim: Despite smoking (i.e., combustible cigarette use) being a known cause of cardiovascular disease, many individuals continue smoking after experiencing a major cardiac event. It is imperative to understand the determinants of continued smoking in this population, which stands to benefit from receiving smoking cessation services. In the current study, we examined whether patients with different social smoking environments (i.e., family or friends who also smoked) varied along sociodemographic characteristics and health and smoking behaviors.
Methods: Participants (N = 149) were patients hospitalized for a coronary event whose medical record indicated they smoked and were eligible for outpatient cardiac rehabilitation (CR). Patients (both sexes) completed a survey during hospitalization and were contacted 3 months later. Patients were dichotomized according to whether they responded that "None or Few" versus "Some or Most" of their friends and family also currently smoked. Sociodemographic, smoking behaviors, second-hand smoke exposure, smoking harm perceptions, and physical and mental health items were compared using t-tests and chi-squared tests ($p < .05$). ORs were calculated to compare rates of CR attendance and self-reported cessation at follow-up.
Results: The groups did not differ at hospitalization on sociodemographic characteristics, physical and mental health, smoking harm perceptions, or smoking behaviors. However, patients in the Some or Most group experienced more second-hand smoke exposure ($p < .01$). Patients in this group were less likely to attend cardiac rehabilitation at follow-up (OR .40, 95% CI: .17 - .93). There was also a trend towards less cessation in this group, but the difference was not statistically significant (OR 0.55, 95% CI 0.24 - 1.22).
Conclusions: Social environments with more smokers predicted worse outpatient CR attendance. Clinicians should consider patients' social environment when addressing smoking.

Infectious Disease

REDUCING THE BURDEN OF HIV AMONG PERSONS WHO INJECT DRUGS: A COST-EFFECTIVENESS ANALYSIS IN SIX U.S. CITIES

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Abstract Detail: Human
Drug Category: Opiates/Opioids

Topic: HIV/Immune

Abstract Category: Original Research

Aim: Persons who inject drugs (PWID) are at a disproportionately high risk of HIV infection. We aimed to determine the highest-valued combination implementation strategies to reduce the burden of HIV among PWID in six US cities.

Methods: We identified and estimated costs and previously-documented scale of delivery for 14 evidence-based interventions from the US CDC's Compendium of Evidence-Based Interventions and Best Practices for HIV Prevention and from the published literature. Using a dynamic, compartmental HIV transmission model calibrated for Atlanta, Baltimore, Los Angeles, Miami, New York City and Seattle, we assessed the value of implementing combinations of evidence-based interventions at optimistic (drawn from best available evidence) or ideal (90% coverage) scale-up. We estimated reduction in HIV incidence among PWID, quality-adjusted life-years (QALYs), total costs and incremental cost-effectiveness ratios (ICERs) for each combination and city compared to the status quo over a 20-year time horizon (healthcare perspective; 3% annual discount rate, 2018$US). Interventions were implemented for a 10-year period. In addition, we estimated health production functions, representing combination implementation strategies providing the greatest health benefits for incremental investment levels.

Results: Combinations that maximized health benefits contained between six (Atlanta and Seattle) and twelve (Miami) interventions with ICER values ranging from $94,069/QALY in Los Angeles to $146,256/QALY in Miami. These strategies would reduce HIV incidence among PWID in 2030 by 8.1% (2.8%, 13.2%) in Seattle to 54.4% (37.6%, 73.9%) in Miami. Implementing the selected combination strategies at near-ideal levels would result in large reductions in Miami, Los Angeles and Atlanta (75.5%, 49.0% and 44.8% respectively) and Baltimore, New York City and Seattle reaching 16.1%, 17.7% and 19.2% reductions, respectively.

Conclusions: Evidence-based interventions targeted to PWID can deliver considerable value, however ending the HIV epidemic among PWID will require innovative implementation strategies and supporting programs to reduce social and structural barriers to care.

TRANSACTIONAL SEX AS A PATHWAY FOR RISING SEXUALLY TRANSMITTED INFECTIONS AMIDST THE OPIOID EPIDEMIC

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Abstract Detail: Human

Drug Category: Opiates/Opioids

Topic: Behavior

Abstract Category: Original Research

Aim: Recently, the United States has experienced increases in both sexually transmitted infections (STIs) and opioid use disorder. Discussion of STIs in association with the opioid epidemic typically center on injection drug use and needle-sharing. However, there are other pathways of infection associated with substance use, in particular the exchange of oral, anal or vaginal sex for drugs (i.e., transactional sex). The purpose of this study was to examine the prevalence and associated factors of transactional sex among a sample of chronic opioid users.

Methods: Individuals entering one of 91 treatment centers across the United States for opioid use disorder (N=1,594) in 2018-2019 were surveyed on sociodemographic variables, opioid

use patterns, the trading of sex (e.g., oral, anal or vaginal) for drugs, and history of STI diagnosis/treatment.

Results: Transactional sex was endorsed by 24.0% of treatment-seeking opioid users. Sexual minorities had exceptionally high rates compared to heterosexuals (56.0% vs. 18.8%, p<0.001), as did females compared to males (41.7% vs. 13.5%, p<0.001) and opioid injectors compared to non-injectors (31.8% vs. 18.1%, p<0.001). In terms of STI history, those who exchanged sex for drugs were significantly (p<0.001) more likely than those who have not to have been diagnosed with at least one STI (59.7% vs. 27.6%), syphilis (16.1% vs. 1.8%), genital herpes (24.2% vs. 5.3%) chlamydia (30.1% vs. 11.9%), gonorrhea (32.3% vs. 11.4%), and HIV (3.7% vs. 1.3%, p=0.002).

Conclusions: The exchange of sex for drugs was endorsed by a significant proportion of chronic opioid users and associated with higher rates of STIs, notably syphilis. While transactional sex was higher among females and opioid injectors, what was most striking is the high engagement of this behavior among sexual minorities. Opioid users, in particular sexual minorities, should receive increased engagement with prevention and intervention programs designed to mitigate potential infection from transactional sex.

INJECTION DRUG USE INITIATION TIMING AND SOCIAL CIRCUMSTANCES: RELATIONSHIPS TO SEVERITY OF DRUG USE SYMPTOMOLOGY IN A SAMPLE OF JUSTICE-INVOLVED RURAL WOMEN

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Injection drug use (IDU) is increasingly prevalent in rural areas, including among rural women. However, initiation to IDU among rural women who inject drugs (WWID) remains understudied, including how initiation contexts may predict later substance use-related outcomes. Thus, the present study aims to 1) profile timing and social circumstances of IDU initiation in a sample of justice-involved rural WWID, and 2) determine the relationship of IDU initiation timing and circumstances to current severity of drug use symptomology.

Methods: Women were randomly selected from three jails in rural Kentucky, screened for high-risk behaviors, and interviewed face-to-face. All women who reported lifetime IDU (N=302) were included in analyses. Linear regression models analyzed unique contributions of timing (age of initiation and total years of injection) and circumstances (including presence of others, location, drug used, and whether the initiate was already intoxicated) of IDU initiation to current drug use symptomology, measured using the GAIN Substance Problem Scale (SPS).

Results: On average, women in the sample were 31.6 years old, first injected drugs at 24.6 years old, and reported 6.2 years between their first and most recent injections. Most women initiated IDU in the presence of others (90.1%), while high (54.6%), and with drugs they had bought themselves (55.3%), usually opioids (67.5%). In regression models, being high and with others (vs. alone) were uniquely associated with higher current SPS scores. Length of time between first and most recent injections was significantly (positively) associated with SPS scores.

Conclusions: Study results suggest that both the duration of women's injection careers and the context of IDU initiation may serve as markers for more severe substance use patterns, echoing earlier studies highlighting the social nature of IDU initiation among women. Findings demonstrate the need for programs to target transitions to IDU or early-stage IDU interventions for rural drug-using women.

HEALTH SERVICES UTILIZATION AMONG PERSONS WITH OPIOID USE DISORDER, HEPATITIS C VIRUS, AND HUMAN IMMUNODEFICIENCY VIRUS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: HIV/Immune
Abstract Category: Original Research

Aim: Incidence of hepatitis C virus (HCV) and human immunodeficiency virus (HIV) infection are increasing in persons with opioid use disorder (OUD). Patients with HIV and OUD/HCV require additional medical management to avoid unnecessary morbidity, and those who do not receive appropriate care may be at high risk for hospital readmission and repeat emergency department (ED) use. This study compared healthcare utilization by type between those with OUD/HCV and OUD/HCV/HIV, and examined the risk of primary care use, repeat ED use, and hospital readmission.

Methods: This retrospective cohort study used electronic medical record data from 2,152 patients at a large, safety-net hospital from 2013-2017. We compared utilization rates per 1000 patient-days of all healthcare, primary care, 14-day repeat ED use, and 30-day hospital readmission of those with OUD/HCV vs. OUD/HCV/HIV using t-tests. We estimated risk of primary care use, 14-day repeat ED use, and 30-day hospital readmission using Anderson-Gill (AG) proportional hazards regression models.

Results: Compared to patients with OUD/HCV (n=1,866), those with OUD/HCV/HIV (n=266) had significantly higher rates of all healthcare utilization (49.2 vs. 41.4; p = 0.02). Similar rates of primary care utilization were observed between groups, but those with OUD/HCV/HIV had significantly higher rates of repeat ED utilization (1.26 vs. 2.18; p = 0.01) and hospital readmission (1.24 vs. 2.00; p = 0.03). Adjusted AG regressions found no difference in risk of repeat ED use, but OUD/HCV/HIV patients had 18% decreased risk of primary care use (HR = 0.81, 95% CI: 0.66, 0.96) and 24% increased risk of hospital readmission (HR = 1.24, 95% CI: 1.12, 1.36).

Conclusions: Patients with HIV in addition to OUD/HCV are at increased risk for hospital readmission, which may relate to suboptimal engagement in primary care. Integrated models of care for patients with OUD/HCV/HIV may facilitate timely care, improve health, and reduce risk of hospital readmission.

SUBSTANCE USE TREATMENT PERCEPTIONS AND EXPERIENCES AMONG MEN WHO HAVE SEX WITH MEN WHO USE STIMULANTS IN THE NORTHEASTERN UNITED STATES

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Treatment
Abstract Category: Original Research
Aim: To understand the perceptions of and experiences with substance use treatment of gay, bisexual, and other men who have sex with men (MSM) who use stimulants to develop an intervention to connect them to substance use treatment.
Methods: We conducted semi-structured, individual in-depth interviews with MSM in New Haven, CT, or Providence, RI, who reported use of stimulants in the three months prior to the interview. Interviews covered topics ranging from the participant's social network to perceptions of and experiences with alcohol and drug use and substance use treatment. Participants also completed a demographic and risk behavior survey as well as the AUDIT-C and ASSIST Lite after the interview. Qualitative data were analyzed using thematic analysis.
Results: A total of 22 participants were interviewed. Sixteen of these interviews were conducted in Providence, Rhode Island and 6 were conducted in New Haven, Connecticut. Nearly half of participants (45.5%) identified as gay and another 13.6% identified as bisexual. Almost half of participants (45.5%) met the criteria for alcohol use disorder based on ASSIST Lite scores and 40.9% met the criteria for stimulant use disorder.
Using thematic analysis of the interviews, three major themes were identified : 1) participants defined treatment to include a variety of modalities including 12-step groups, 2) social networks can play both a positive and a negative role in deciding to access treatment, 3) a desire and demand for harm reduction approaches to treatment.

Conclusions: Treatment programs for substance use in general and stimulant use in particular need to: establish a greater continuum of care across treatment modalities, incorporate harm reduction approaches into service offerings, and carefully consider how to involve other people in an individual's treatment process.

ANTIRETROVIRAL THERAPY (ART) ADHERENCE AND PRENATAL ALCOHOL USE AMONG WOMEN LIVING WITH HIV WHO WERE PREGNANT IN SOUTH AFRICA

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Abstract Detail: Human
Drug Category: Alcohol
Topic: HIV/Immune
Abstract Category: Original Research
Aim: Women of historically underserved racial/ethnic groups are disproportionately represented in the syndemic issues of HIV, intimate partner violence, and substance and alcohol use in South Africa. Prenatal exposure to alcohol itself can cause pregnancy, birth, and neonatal complications, including a range of lifelong disorders including fetal alcohol spectrum disorders (FASD).
Methods: The study is focused on pregnant participants as part of a larger implementation science study testing alcohol reduction and HIV medication (ART) adherence of an evidence-based, gender-focused intervention (The Women's Health CoOp; WHC) with women living

with HIV and reporting alcohol or other drug use. Outcomes included both clinic-level and patient-level, and patient-level outcomes included sex risk behaviors, alcohol and drug use, and ART adherence. A descriptive analysis was conducted as preliminary data on women living with HIV who were pregnant during the 6-month study period.

Results: Of 33 women who were pregnant at baseline, five women continued being pregnant at 6-month follow-up. Self-reported 85% or greater ART adherence was 60% at baseline with confirmed viral loads. One did not attend 6-month follow-up, and three of the four showed decreases in viral loads at follow-up. All five were at risk for alcohol use disorder at baseline; however only two were at risk at follow-up. The number of average days of alcohol use in the past month was 12±4.3 at baseline but reduced to 4.8±7.2 at follow-up.

Conclusions: Findings provides critical messages on the importance of focusing on women living with HIV who are pregnant in South Africa who are also highly at risk for prenatal drinking, therefore having children with FASD, and violence exposure. Continued implementation and cost-effectiveness research on the WHC tailored to women living with HIV who are pregnant in South Africa should be a high priority to support healthy South African pregnancy outcomes.

TRANSACTIONAL SEX HISTORY AS A PREDICTOR OF FUTURE HEALTH RISK BEHAVIOR AMONG RURAL DRUG-USING WOMEN

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Abstract Detail: Human
Drug Category: Other, Any Illicit Drug Use
Topic: Prevention
Abstract Category: Original Research

Aim: Despite the increased prevalence of HIV and other sexually-transmitted infections among those with a transactional sex history (history of exchanging sex for drugs, money, goods, or services), little is known about how transactional sex relates to health risk behaviors among justice-involved populations, particularly among rural women. Given this gap in the literature, this study aims to examine transactional sex history as a predictor of health risk behaviors among rural drug-using women re-entering the community.

Methods: This study involved random selection, screening, and face-to-face interviews with 400 drug-using women recruited from three rural Appalachian jails. Analyses focused on participants who had completed the 6- and 12-month follow-up interviews post-release (N=340). Bivariate analyses and multivariate logistic regression were used to examine transactional sex history at baseline as a predictor of relapse and other health risk behaviors during community re-entry.

Results: Nearly half (44.1%) of participants had exchanged sex in their lifetime. Individuals with a transactional sex history were significantly younger (31.5 vs. 33.4 years) and more likely to report mental health symptoms (72.0% vs. 60.0%) during the 12-month follow-up period, but were less likely to be married (32.0% vs. 45.3%) and employed (22.7% vs. 33.2%). Regression models indicated that after controlling for substance use problem severity, having previously exchanged sex was positively correlated with relapse (AOR=2.1), injection drug use (AOR=2.7), continued transactional sex (AOR=13.7), and unprotected sex (AOR=2.1) during the follow-up period.

Conclusions: Results suggest that not only is transactional sex prevalent among rural, drug-using women, but sex exchange is a consistent predictor of continued risky behaviors when

these women return to the community. Findings signal important implications for preventing the spread of HIV and other sexually-transmitted infections in rural areas where services may be limited, including developing education programs and risk-reduction interventions targeting those most likely to continue engaging in health risk behaviors.

THE IMPACT OF SEX ON CHANGES ON DEPRESSIVE SYMPTOMS DURING HCV TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Sex Differences
Abstract Category: Original Research
Aim: Women are an underrepresented population in studies involving drug dependence and hepatitis C virus (HCV). Interferon-based medications for HCV are associated with exacerbations of depressive symptoms in both genders. We know of no studies examining changes in depressive symptoms in males and females receiving new direct-acting antivirals (DAA) for HCV treatment. This study aimed at addressing this gap by exploring prevalence and severity of depressive symptoms in females and males with a history of injection practices receiving treatment for HCV.
Methods: Participants were 141 injection drug users successfully treated for HCV (64.5% female; 51.4 years old). Measures included sociodemographics, depressive symptoms (BDI), alcohol (AUDIT) and drug use (toxicology tests). Participants completed all assessments at baseline, treatment (weeks 4, 8, 12) and follow-ups (weeks 12 and 24). Linear mixed models were used to compare BDI scores across assessments based on gender and recent drug and alcohol use.
Results: At baseline, women were more likely to have a diagnosis of depression than men (60.0% vs. 40.7%, p=0.028). Prescription of psychiatric medication did not differ by gender (p =0.15). Mixed models showed a significant group-by-time interaction, indicating that changes over time were different between males and females (p=0.003). BDI scores among men were significantly lower at treatment weeks and follow-ups compared to baseline (ps<0.001). No change in mean BDI scores among females was observed. Recent drug or alcohol use had no impact on depressive symptoms.
Conclusions: This study is the first to examine changes in depressive symptoms among a sample of male and female receiving DAA. HCV treatment initiation promoted significant reductions in depressive symptoms among men that persisted long term, regardless of concurrent drug or alcohol use. No changes in mean BDI scores were observed in women. Interventions that target depressive symptoms during HCV treatment among women should be a priority.

BRINGING PREP TO MSM WHO USE SUBSTANCES AND PEOPLE WHO USE OPIOIDS IN HIGHER HIV INCIDENCE US CITIES: A NIDA CLINICAL TRIALS NETWORK (CTN) IMPLEMENTATION SURVEY STUDY

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: HIV/Immune
Abstract Category: Program Descriptions
Aim: Southern US cities with highest HIV incidence have an immediate need for accelerated implementation of pre-exposure prophylaxis (PrEP) services among men who have sex with men who use substances (SU-MSM) and People Who Use Opioids (PWUO), arising from increasing rates of injection and potential mixing between networks of people who use stimulants and opioids. In this presentation, we describe the methodology for a single-assessment PrEP and opioid use services implementation survey study (CTN-0082).
Methods: In eight southern cities with highest HIV incidence, this study will use a multi-level, mixed methods design in one STI clinic and one harm reduction-/substance use-centered program where SU-MSM and PWUO seek services. Data will be obtained from consumers (N=480, N=30/site, n=240 each SU-MSM and PWUO); frontline providers (N = ~320, < 20/site); and agency directors (N = 16, 1/site) using a web-based survey for all participants, plus a qualitative interview for agency directors.
Results: Data will be: (1) PrEP awareness, experience, willingness and intention (i.e., to use, for consumers, and to refer for or to offer, for providers and directors); barriers and facilitators; and strategies for implementation of PrEP services, for SU-MSM and PWUO; and (2) Comparable information about opioid use services (e.g., medication for opioid use disorder, opioid use behavioral counseling, naloxone for overdose prevention, syringe services). Using the i-PARIHS framework, the study will explore the effects of Structural-, Provider-, and Consumer-level predictors on these two sets of outcomes.
Conclusions: Data will improve understanding of the knowledge, interest, perceived barriers and facilitators, and suggested strategies for offering and/or linking higher risk people to PrEP and opioid use services, from the perspectives of consumers, providers, and agency directors. Data may help STI clinics and community harm reduction-/substance use-centered programs plan and implement or enhance PrEP- and opioid use services.

IMPACT OF DRUG USE DENSITY ON LATINO MSM GEOGRAPHIC ACCESSIBILITY TO PREP SERVICES IN MIAMI-DADE COUNTY

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: HIV/Immune
Abstract Category: Original Research
Aim: To characterize the impact of polydrug use on Latino MSM geographic accessibility to PrEP services in MDC.
Methods: This cross-sectional study analyzes 148 drug-use polygons collected from 140 Latino men who have sex with men (LMSM) from October 2018 – November 2019. Study inclusion included being a LMSM meeting CDC clinical PrEP candidate requirements. A community partner recruited LMSM in Miami-Dade County (MDC) using respondent-driven social network approaches. Participants identified areas where they use/find different drugs

(e.g., cocaine, ecstasy) using ArcGIS. Addresses of PrEP providers in MDC were geocoded (data obtained from PrEPlocator.org). Network analysis identified accessibility to service areas (travel distance) for walking and driving. We used SPSS to create a logistic regression model predicting PrEP uptake and identify associations.

Results: In total, 140 participants reported using/obtaining drugs in 148 polygons throughout MDC: marijuana (n=143), cocaine (n=75), ecstasy (n=44), ketamine (n=13), nonprescribed medications (n=12), GHB (n=5), and opioids/heroin (n=2). Use of three or more drugs was negatively associated with PrEP uptake ($p<0.005$). Of drug-use polygons, 29 had their center within 1-mile walking distance to a PrEP provider and 146 drug-use polygons within 10-miles driving distance to a PrEP provider. Although nonPrEP users had drug use polygon centers further from PrEP providers, this relationship was not statistically significant.

Conclusions: Our findings suggest that drug use may exacerbate geographic PrEP disparities. Future PrEP-uptake interventions should focus on how geographic accessibility can be enhanced through HIV interventions tailored for people with polydrug use or to include drug use prevention and treatment.

CORRELATES OF HOMELESSNESS AMONG PATIENTS IN METHADONE MAINTENANCE TREATMENT

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: To evaluate the correlates of homelessness among patients enrolled in methadone maintenance (MMT) for opioid use disorder.

Methods: Demographic, diagnosis-related, and treatment-related correlates were assessed by self-report for one hundred and sixty-four male and female patients in MMT at the APT Foundation, a non-profit community-based organization in Connecticut. Correlates of past-month homelessness were investigated with bivariate and logistic regression.

Results: Bivariate analyses initially identified six statistically significant ($p<.05$) correlates of homelessness: gender, Latinx ethnicity, Brief Symptom Inventory (BSI) Depression subscale, duration of MMT, take-home bottle status, and Depressive Experience Questionnaire (DEQ) Self-Criticism subscale. In the final logistic regression model, patients in MMT who were homeless (versus domiciled) were more likely to be male (OR 0.40; CI 0.16-0.98) and report higher scores on BSI Depression (OR 1.07; CI 1.02-1.12).

Conclusions: Patients in MMT who are homeless are more likely than their domiciled counterparts to be male and to report higher depressive symptoms. Future prospective research should both disentangle the directionality of the relationship between homelessness and depression among patients in MMT and examine further whether treatment response among MMT patients is associated with homelessness.

CHARACTERISTICS OF HIGH-RISK INJECTORS OPIOID USE DISORDER INDIVIDUALS IN PHILADELPHIA, PA: HIGHLIGHTS FOR INTERVENTIONS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: To estimate the prevalence of HIV infection, risk-taking behaviors and depression among opioid injectors in a neighborhood of Philadelphia with the highest concentrations of drug users (Kensington, Philadelphia, PA).
Methods: Penn Mobile Clinical Trials Unit and well tested procedures have been used to recruit high-risk injection drug users. Data on addiction, mental health and risk-taking behavior were collected through standardized interviewer-administered questionnaires.
Results: The sample consisted in 143 individuals (70% male, 64% Caucasian) who met DSM-5 opiate use disorder criteria (95% endorsed 6+ criteria), reporting using heroin (97.2%) and other opioids including fentanyl (74.1%), methadone (18.4%) and buprenorphine (20.0%). They are mostly polysubstance users with urine drug screens were positive for cocaine (62.7%), cannabis (29.6%), benzodiazepines (21.9%), methamphetamines (9.9%) and amphetamines (2.9%), almost all reported smoking tobacco (94.4%) and 28.7% reported drinking alcohol regularly (more than 10 days per month). Almost three-quarter (72%) reported overdoses in lifetime, more than two-thirds (70.4%) had ever received addiction treatment, and 36% reported being currently receiving treatment. More than half (57%) reported symptoms of depression and 55% reported an history of psychiatric disorder, mostly mood and anxiety disorders but only 18% of them currently received treatment for it. Number of previous addiction treatment is associated with depression (p=0.02) and suicide attempts (p=0.03). Overdose is associated with depression (p<0.0001) and suicide attempts (p<0.001). About 25% of the individuals reported sharing needles and paraphernalia in the past 6 months. The HIV prevalence was 8.4% (n=12), of which 67% (n=8) reported receiving ART and 87% (n=7) had a detectable viral load. HIV-positive individuals reported more injection-related risk-taking behavior.
Conclusions: The prevalence of HIV infection, risk-behavior and depression were high and highlight the needs to develop strategies to enhance the engagement, adherence and retention in integrated mental health-addiction-HIV care.

PSYCHOSOCIAL CORRELATES OF CANNABIS USE DISORDER AMONG PERSONS LIVING WITH HIV

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids

Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: To date, 33 states have legalized marijuana for medicinal use for several clinical conditions including HIV. Persons living with HIV (PLWH) are more likely to report a substance use disorder compared to the general population. Thus, identifying predictors of cannabis use disorder (CUD) has become a leading concern among researchers.
Methods: Current marijuana users living with HIV (N=142) were recruited from community health centers across Florida and completed questionnaires related to HIV clinical outcomes, mental health, and substance use information. CUD was assessed using a checklist based on the DSM-5 criteria for CUD. Participants reporting two or more CUD symptoms during the past 6 months were classified as having CUD. Covariates were selected using the psychosocial theory of drug abuse. Psychological covariates included symptoms of anxiety, depression, and PTSD. Social factors included employment, insurance, and housing. Additional covariates included sociodemographic variables and frequency of marijuana use. A logistic regression analysis was utilized to assess the association between psychosocial covariates and CUD.
Results: Overall, 39% of participants reported at least two current symptoms of CUD. The most prevalent symptoms of CUD were trying but failing to reduce or stop taking marijuana (23.0%) and continuing marijuana use even though it has caused problems (19.5%). In multivariable analyses, participants had greater odds of having a CUD if they had current symptoms of anxiety [AOR= 2.7 (95% CI=1.2: 6.4)], homelessness [AOR3.9 (95% CI= 1.3: 11.9)], or were daily marijuana users [AOR 4.6 (95% CI=1.7: 13.6)]. Sociodemographic factors including race/ethnicity and gender were not statistically significant in the final multivariable analyses.
Conclusions: Our study noted a relatively high prevalence of CUD symptoms in this sample. As such, providers caring for PLWH who use marijuana should assess for symptoms of CUD, especially in those with anxiety or who are homeless.

CORRELATES OF PRE-EXPUSURE PROPHYLAXIS (PREP) STIGMA IN SUBSTANCE USING WOMEN

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: HIV/Immune
Abstract Category: Original Research
Aim: Although people who use drugs have significant HIV risk, research efforts have focused on injection drug users and men who have sex with men while risk in substance using women (SUW) has been neglected. Ethnic minority and economically-disadvantaged women bear a disproportionate burden of HIV-related health and social consequences. Pre-exposure prophylaxis (PrEP) is an effective HIV prevention method, but has been underutilized by women. The current study aims to explore factors associated with risky sexual behaviors and pre-exposure prophylaxis (PrEP) stigma in this population.
Methods: Participants were 106 primarily ethnic-minority SUW (agem=33.5, 50% Black/African American, 27.4% Hispanic/Latinx, 14.2% multi-racial, 78.3% "straight or heterosexual") who agreed to participate in a study of substance use (SU) and HIV prevention

attitudes. Participants included women residing in the Greater Houston area who reported past 30 day alcohol or SU who were recruited via Qualtrics Panels to complete an online survey.

Results: 32.1% reported never being tested for HIV. SU related problems were associated with higher sexual risk as measured by the Risk Assessment Battery (AUDIT(r=.589, p<.01); CUDIT (r=.495, p<.01); DAST-10 (r=.609, p<.01). Medical mistrust was associated with perceived PrEP stereotypes (r=.313, p<.01) and was negatively correlated with HIV testing attitudes (r=-.488, p<.01) indicating higher medical mistrust is associated with less favorable attitudes towards HIV testing. An independent samples t-test revealed no significant differences between individuals who had previously heard of PrEP and those who had not in terms of PrEP user stereotypes or anticipated disapproval by others.

Conclusions: Within this sample, several participants had one or more CDC-defined PrEP indications (multiple partners, inconsistent condom use with partners of unknown HIV status and transactional sex). Despite these risks, there was significant perceived stigma associated with PrEP use and HIV testing. These results indicate a need for research on approaches to increasing engagement in HIV prevention strategies for SUW.

THE INCIDENCE OF HEPATITIS C VIRUS AMONG PEOPLE WITH OPIOID USE DISORDER ON BUPRENORPHINE MAINTENANCE THERAPY: A SCOPING REVIEW

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Literature Review
Aim: The United States is experiencing an unprecedented epidemic of hepatitis C virus (HCV) infection related to injection drug use among people with opioid use disorder (PWOUD). Expansion of buprenorphine maintenance therapy (BMT) been championed as a way to reduce incident HCV infection. We aim to investigate the scope of evidence that delineates the relationship between PWOUD's exposure to BMT compared to other forms of medication for opioid use disorder (MOUD) or no MOUD and the risk of incident HCV infection.
Methods: We conducted a scoping review of studies assessing the risk of HCV infection while on BMT in PWOUD using PRISMA-ScR guidelines. We did not restrict studies based on date of study publication, study design, or sex of population. We only reviewed studies in English. We searched MEDLINE, EMBASE and Cochrane databases on November 19, 2018 and identified 567 studies to screen using our search terms (ex. buprenorphine AND hepatitis C virus AND opioid use disorder). We included studies that described the risk of incident HCV infections among people on MOUD for full text reviews. We will conduct full text screening and extract the population, intervention, comparison and outcome of qualifying studies.
Results: We identified and screened the title and abstract of 567 studies. We found that BMT is rarely studied as a single exposure and is often grouped in MOUD. We have not identified a study that compares BMT with other forms of MOUD or no MOUD. Most studies have not identified the study population as PWOUD.
Conclusions: We have not found a study that directly assess the effectiveness of BMT in reducing incident HCV among PWOUD. Assessing the impact of BMT on the risk of HCV

infection requires a greater number of studies and more direct comparisons between BMT, other forms of MOUD, and no MOUD use among PWOUD.

EXPLORING HOW HOSPITALIZATION TRANSFORMS THE RELATIONSHIP BETWEEN SUBSTANCE USE, HEPATITIS C, AND IDENTITY

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Abstract Detail: Human
Drug Category: Other, Hepatitis C Virus
Topic: Treatment
Abstract Category: Original Research

Aim: Persons who use drugs (PWUD) commonly experience complex illness, psychosocial stressors, housing insecurity, and stigma that may influence self-concept and identity. In a study of hospitalized PWUD with hepatitis C virus infection (HCV), participants described treating HCV as "part of recovery." These findings led us to explore how hospitalization informs patient identity as related to their HCV status and substance use disorder (SUD) treatment.

Methods: We audio recorded in-depth semi-structured individual interviews of 27 hospitalized adults with SUD and chronic HCV seen by an addiction consult service at an urban academic medical center between June and November 2019. Transcribed interviews were dual coded deductively and inductively at the semantic level then analyzed for themes using iterative categorization.

Results: Many patients felt that curing HCV would be personally transformative because HCV status was deeply connected with identity as a PWUD or person in recovery. Three identity profiles emerged: 1) Patients newly engaged in SUD treatment during hospitalization felt that starting HCV curative treatment would reinforce their motivation to continue SUD treatment and serve as a "step towards recovery."2) Among patients in recovery before hospitalization, many felt acute illness and positive HCV status were artifacts of past drug use that directly challenged their identity as someone in recovery. For them, HCV was a "symbol of using" in their "old life" and HCV cure would allow them to "move forward." 3) Among patients with limited motivation to stop using, most were not interested in discussing HCV treatment during hospitalization.

Conclusions: Among hospitalized adults with SUD and HCV, the possibility of HCV cure was intertwined with their identity with drug use and recovery. Discussion of HCV treatment during hospitalization may be an opportunity to support people in their recovery journey.

RETENTION IN MEDICATION TREATMENT FOR OPIOID USE DISORDER AMONG HIV INFECTED AND UNINFECTED VETERANS

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Abstract Detail: Human

Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: Medication treatment for opioid use disorder (MOUD) is associated with positive health outcomes, including improved HIV management. Despite these benefits, long-term retention on MOUD remains low. We sought to identify predictors of MOUD retention among people with and without HIV.
Methods: We used data from the Veterans Aging Cohort Study (VACS), a national cohort of people with HIV (PWH) and demographically matched uninfected patients receiving care within the Veterans Health Administration. Using data from 2008-2017, we identified patients who initiated MOUD (buprenorphine or methadone) within one year of a new OUD diagnosis, followed patients for 12 months, and evaluated retention. Buprenorphine retention was defined as $\geq 80\%$ of days covered by prescription. Methadone retention was identified by patient visits to opioid treatment programs. Univariate analyses identified demographic and health-related variables associated with retention, multivariate logistic regression identified adjusted associations. Models were stratified by HIV status to identify differences in predictors of retention by HIV.
Results: Of patients diagnosed with OUD, 1,010 (14.1%) initiated MOUD within one year; PLWH and uninfected patients were similarly likely to initiate (p=0.36). 58% of patients initiated methadone and 42% initiated buprenorphine. Of those who initiated MOUD, 23% were retained for one year, and likelihood of retention did not vary by HIV status (p=0.34). In adjusted analyses, among PWH, Hepatitis C diagnosis (adjusted odds ratio [aOR]=2.82, 95% CI 1.39 – 5.72), and receiving buprenorphine (relative to methadone; aOR=2.69, 95% CI 1.52-4.76) were associated with higher retention. Among those uninfected, history of homelessness (aOR=0.38, 95% CI 0.25-0.58) was associated with lower retention, while receiving buprenorphine was associated with higher retention (aOR=2.76, 95% CI 1.71-4.45).
Conclusions: MOUD retention at 12 months was low for all patients. System-level efforts to promote MOUD retention for all Veteran patients are warranted.

DIFFERENCES BETWEEN INJECTION AND NON-INJECTION STATUS AMONG AFRICAN AMERICANS IN MEDICATION TREATMENT FOR OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Treatment admissions both nationally and locally consistently show African Americans are less likely to inject opioids than Whites. Reasons underlying this less harmful way to use opioids are unknown. The purpose of this study was to explore differences between African American injection and non-injection opioid users via the framework outlined by Sung et al. (2000) and clinical observations.
Methods: A purposive sample of newly admitted African American patients by preferred route of administration were recruited between January 2018 and August 2019. Participants completed a fifteen minute questionnaire which covered mental health, trauma, history of substance use, and needle phobia as well as perceptions regarding injection use (e.g., HIV risk,

stigma, police profiling, social acceptance, and market force factors including perceived quality and cost) and social network injection use. Results are expressed as effect sizes.

Results: The 50 participants (29 men) had a mean age of 59.40. Injectors (n=16) were younger at first opioid treatment episode (Cohen's d=.34), first methadone-specific treatment episode (Cohen's d=.28), and current age (Cohen's d=.25). Although most mental health measures did not differ by group, injectors were more likely (68.8% versus 38.2%; Cohen's h=.62) to receive mental health services as adults. Importantly, they endorsed fewer symptoms of needle phobia (Cohen's d=.72). Injectors had higher AUDIT scores (Cohen's d=.79) and lower cocaine use severity (Cohen's d=.30). They also had more close friends who injected (72.7% versus 40.7%; Cohen's h=.68).

Conclusions: In our exploratory study, we found differences between African Americans admitted to medication treatment for opioid use disorder who inject opioids and those who prefer other routes of administration. Findings provide initial insight into possible risk and protective factors of injection opioid use, such as needle phobia, alcohol use, and social network. This information could aide in prevention and harm reduction efforts to reduce injection opioid use.

A LONGITUDINAL ANALYSIS OF HIV STIGMA AND ART INITIATION AMONG HIV-POSITIVE PEOPLE WHO INJECT DRUGS IN SAINT PETERSBURG, RUSSIA

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Abstract Detail: Human
Drug Category: Other, injected drugs
Topic: HIV/Immune
Abstract Category: Original Research

Aim: We examined HIV stigma score changes and its association with antiretroviral treatment (ART) initiation in HIV-positive people who inject drugs (PWID) in Saint Petersburg, Russia (2012-2015).

Methods: We assessed HIV stigma scores (Berger Scale) in a prospective cohort of 165 ART-naïve HIV-positive PWID at baseline, 12- and 24-months. We used generalized estimating equation to estimate changes in HIV stigma while the individuals were ART-naïve. We used pooled logistic regression to estimate the effect of HIV stigma on ART initiation. All analyses were adjusted for gender, age, CD4 cell count, duration of HIV diagnosis, recent (past 30-day) drug use and depressive symptoms (CES-D $\geq$16).

Results: At baseline, participants' mean (standard deviation) HIV stigma score was 23.3 (6.2), age 33.6 (4.9) years. Thirty % were male, 28% had CD4 count <350, 44% and 48% reported recent drug use and depressive symptoms., respectively Over the 24-months study period, 31% initiated ART. Mean duration between HIV diagnosis and ART initiation was 8.9 years. We estimated that on average, the HIV stigma score changed yearly by -0.57 (95% CI -1.36, 0.22). HIV stigma score was not associated with ART initiation (AOR 0.99, 0.94, 1.04). The odds of ART initiation were higher among individuals with depressive symptoms (AOR 2.06, 1.04-4.07) and lower among those with recent drug use (AOR 0.39, 0.20-0.76).

Conclusions: We found no evidence to suggest that HIV stigma changed over a 2-year study period in ART-naïve PWID. HIV stigma score was not independently associated with ART initiation. Interventions need to empower PWID to cope with HIV stigma and promptly initiate ART independent of their stigma or mental health status.

EVALUATING THE EFFECTS OF MEDICATIONS FOR OPIOID USE DISORDER ON HIV RISK BEHAVIORS AMONG A NETWORK OF PEOPLE WHO INJECT DRUGS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: HIV/Immune
Abstract Category: Original Research

Aim: People who inject drugs (PWID) are a population with increased HIV risk due in part to sharing drug injection equipment. In networks of people connected through risk behavior, individuals can exert influence on each other. Evidence suggests that receiving treatment for opioid use disorder can reduce HIV risk behaviors; however, limited studies have been conducted to determine if there are direct effects (among the participants treated) or disseminated effects (among participants who were not treated themselves, but shared connections with those treated) of medications for opioid use disorder (MOUD) among networks of PWID. We analyzed a network of PWID from the Transmission Reduction Intervention Project conducted in Athens, Greece from 2013 to 2015; 246 participants were included in the analysis to evaluate if receiving MOUD causes reductions in HIV risk behavior and being socially connected to more people that receive MOUD also causes reductions in HIV risk behavior.
Methods: We identified densely connected participants to define communities in the network. To quantify the direct and disseminated effects of MOUD on subsequent HIV risk behaviors, we employed a group-level inverse probability weighted approach to adjust for confounding.
Results: The direct effect of MOUD did not achieve statistical significance. There was a 10% reduction in the likelihood of risk behavior among those in communities where 90% of individuals were prescribed MOUD, compared to communities with 50% of individuals prescribed MOUD (95% confidence interval = -0.13, -0.06).
Conclusions: Individuals not prescribed MOUD may receive a protective benefit by being in a social network with higher MOUD coverage. In addition to efforts to increase the number of MOUD prescribers, prescribers should aim to increase and sustain access to treatment among their patients with OUD.

ASSOCIATION BETWEEN MARIJUANA USE AND INCIDENT DIABETES IN WOMEN AND MEN WITH AND AT RISK FOR HIV

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research

Aim: To determine whether marijuana use is associated with incident type 2 diabetes in women and men living with and at risk for HIV

Methods: We analyzed data from the Women's Interagency HIV Study (WIHS) and Multicenter AIDS Cohort Study (MACS), between 2000-2017 (WIHS) and 1999-2017 (MACS). The association between self-reported marijuana use and incident type 2 diabetes was analyzed using time-dependent Cox regression models among 3,578 and 2,682 participants in the WIHS and MACS respectively.

Results: Over the follow-up period, 452 (WIHS) and 326 (MACS) incident type 2 diabetes cases occurred. In multivariable adjusted models, there was no statistically significant association between self-reported marijuana use, compared to no-use, and incident type 2 diabetes in both HIV-positive and HIV-negative participants in the WIHS and MACS respectively. Additional analysis assessing whether these findings varied by body mass index, racial/ethnicity, smoking and educational status was also not significant.

Conclusions: In this prospective analysis of nearly 20 years of data for women and men with and at risk for HIV in the WIHS and MACS, marijuana use did not increase the risk for type 2 diabetes. To better inform clinical decisions and legal policy regarding marijuana use in this population, further longitudinal investigations that biologically quantify the THC/CBD concentrations of marijuana consumed by study participants to assess risk for incident diabetes is warranted.

HOSPITALIZATION AMONG PERSONS WHO USE DRUGS AND TRAJECTORY OF TREATMENT OF HEPATITIS C INFECTION – DISRUPTOR OR FACILITATOR?

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Abstract Detail: Human
Drug Category: Other, Hepatitis C Virus
Topic: Treatment
Abstract Category: Original Research

Aim: The opioid and stimulants epidemics have resulted in increased hospitalizations and hepatitis C virus (HCV) infections. Persons who use drugs (PWUD) face numerous barriers to initiating and completing HCV treatment. Since hospitalization is an opportunity to engage PWUD regarding their substance use disorder (SUD), we aimed to understand how hospitalization alters HCV treatment readiness and engagement in PWUD.

Methods: We conducted in-depth semi-structured individual interviews with hospitalized adults with SUD and HCV seen by an addiction consult service at an urban academic medical center between June and November 2019. We audio-recorded and transcribed interviews. Transcripts were coded in dual-coded deductively and inductively at the semantic level then analyzed for themes using iterative categorization.

Results: Of 27 participants, average age was 41 (range 23-64) years; majority were Caucasian (85%), male gender (67%), and primarily used opioids (78%). Motivations for HCV cure included 1) relieving emotional burden of possibly infecting others 2) reinforcing commitment to "being sober" 3) improving overall health and 4) "conquering" an achievable task. For motivated patients, some felt their HCV prioritization misaligned with hospital providers' focus on acute health concerns. Most patients felt hospital providers failed discussing their HCV and were dismayed at missed opportunities to address HCV while in a controlled hospital environment. Some patients felt too over-burdened by acute illness and hospitalization, anticipation of multiple outpatient appointments, homelessness, and other psychosocial factors. Largely, these patients did not want to address HCV during hospitalization and were not ready to start treatment. Finally, for patients engaged with outpatient care and a plan for HCV treatment initiation, acute illness could disrupt their pre-hospitalization treatment trajectory.

Conclusions: Hospitalization can be a strong motivator for some PWUD to prioritize HCV and SUD treatment. Hospital providers should ask PWUD about HCV and consider HCV cure as an integral component to engaging PWUD in their care.

PAST-YEAR NONMEDICAL PRESCRIPTION OPIOID OR HEROIN USE BY HIV STATUS IN A NATIONALLY REPRESENTATIVE US SAMPLE: IMPLICATIONS FOR HIV AND SUBSTANCE USE SERVICE INTEGRATION

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: HIV/Immune
Abstract Category: Original Research

Aim: Opioid use is a driver of HIV acquisition and associated with interruptions in HIV treatment, including reduced medication adherence and care disengagement. However, our understanding of opioid use disparities by HIV status at the national-level is limited, as most studies examining substance use among people living with HIV (PLWH) rely on clinic-based samples. We utilized nationally representative data to examine associations between HIV status and opioid-related outcomes.

Methods: The 2015-2017 National Survey on Drug Use and Health included 169,288 individuals ages 12 and older. Respondents self-reported whether a healthcare professional ever told them they had HIV/AIDS (i.e., HIV-positive/PLWH, HIV-negative, HIV-unknown). We calculated weighted prevalence estimates of past-year nonmedical prescription opioid (NMPO), heroin use, and opioid use disorder (OUD) by HIV status. Multivariable logistic regression estimated associations between HIV status and past-year NMPO/heroin use, controlling for age, gender, race/ethnicity, income, population density, and year.

Results: Across years, 0.2% of respondents were PLWH and 0.4% self-reported HIV-unknown status. Past-year NMPO use was 10.3% among PLWH, 4.3% among HIV-negative and 6.3% among HIV-unknown individuals; heroin use prevalence was 2.5%, 0.3% and 0.6%, respectively. Compared to HIV-negative individuals, PLWH had 2.40 times (95% CI=1.49-3.86) the adjusted odds of past-year NMPO/heroin use, while people with HIV-unknown status had 1.42 times (95% CI=0.93-2.17) the adjusted odds of NMPO/heroin use. OUD prevalence was 5.4% among PLWH compared to 1.0-1.3% of HIV-negative or HIV-unknown individuals.

Conclusions: NMPO/heroin prevalence among PLWH was two times higher than among HIV-negative individuals, and OUD was five times higher among PLHW. PLWH may thus be at elevated risk for opioid use-related consequences, including HIV treatment interruptions, HIV-related complications, and opioid-related overdose. Because the opioid epidemic disproportionately burdens PLWH, integrating HIV services and substance use prevention and treatment services may improve both HIV-related and opioid-related outcomes, particularly among PLWH.

A COMPARATIVE ANALYSIS OF RECENT HIV OUTBREAKS AMONG PEOPLE WHO INJECT DRUGS IN EUROPE AND NORTH AMERICA

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: HIV/Immune
Abstract Category: Original Research
Aim: Despite the effectiveness of WHO recommended "combined prevention," multiple outbreaks of rapid HIV transmission were recognized in Europe and North America since 2011. Understanding how/why these outbreaks occurred should contribute to avoiding future outbreaks.
Methods: A research group among persons studying HIV outbreaks among people who inject drugs (PWID) was formed to conduct a systematic review/comparison of the outbreaks. Publications and conference presentations on the outbreaks were compiled and a synthesis was developed through successive rounds of data analyses and interpretation.
Results: During 2011-2016, HIV outbreaks occurred among PWID in Athens, Greece; Bucharest, Romania; Dublin, Ireland; Glasgow, Scotland; Luxembourg; southeastern Saskatchewan, Canada; Scott County, Indiana, United States; and Tel Aviv, Israel. Factors associated with many of the outbreaks included: community economic problems, homeless PWID as a highly vulnerable group, and changes in patterns of drug injection. The outbreaks differed in size (from under 100 to over 1000 newly reported cases of HIV among PWID) and in the extent to which prevention programs had been implemented prior to the outbreaks. Public health responses included introduction or expansion of standard prevention interventions (syringe service programs, opiate substitution treatment, HIV testing and

antiretroviral treatment) but coverage of interventions varied and rates of newly reported cases have not returned to pre-outbreak levels in most of the sites.

Conclusions: Many of the outbreaks studied here were preceded by changes in the local drug use environment, often but not always in combination with low prevention coverage. Countries need to adopt a more proactive attitude towards reaching and maintaining WHO recommended levels of HIV prevention for PWID. In addition, monitoring of the local situation, including changes in patterns of drug use and risk behaviors, with special attention to vulnerable groups such as homeless PWID, should be in place to rapidly detect and contain new HIV outbreaks.

EXAMINING THE POTENTIAL OF PRE-EXPOSURE PROPHYLAXIS (PREP) FOR HIV PREVENTION IN A COMMUNITY SAMPLE OF STIMULANT USERS LIVING IN THE SOUTH

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Abstract Detail: Human
Drug Category: Stimulants
Topic: HIV/Immune
Abstract Category: Original Research

Aim: Individuals who abuse stimulant drugs are at heightened risk for HIV due to both sexual and injection risk behaviors. Pre-exposure prophylaxis (PrEP) has the potential to significantly shift the HIV epidemic in drug users by reducing new infections in high-risk networks, but non-injection drug users have not been targeted for PrEP roll-out. This study describes PrEP candidacy in a sample of active stimulant users living in the central Piedmont area of North Carolina.

Methods: The sample included 353 HIV-negative stimulant users. Participants completed clinical interviews to assess substance use and computerized questionnaires to assess HIV risk behaviors, PrEP awareness, and willingness to take PrEP. All participants completed an HIV test to confirm their HIV negative status. Participants were classified as candidates for PrEP if they endorsed injection drug use, sex with a known HIV-positive partner, sex with multiple partners, or sex trading in the past 6 months.

Results: The sample was well balanced in terms of gender (54% male) and was primarily African American (87%), with a mean age of 46 years. 213 participants (60%) met behavioral eligibility for PrEP. PrEP candidates endorsed more frequent stimulant use ($p < 0.001$) and more symptoms of stimulant use disorder ($p < 0.001$) than non-candidates. Only 29% of participants reported having an HIV test within the past 6 months. Among the PrEP candidates, the most common risk behaviors were sex trading (75%) and sex with multiple partners (67%). Injection drug use was less common (12%). Willingness to take PrEP was positively correlated with perceived HIV risk ($p = 0.003$).

Conclusions: Results show that a large proportion of non-injection stimulant users engage in significant HIV risk behaviors. PrEP may be an effective intervention for reducing HIV transmission within these communities. Evaluation for PrEP eligibility should extend beyond focusing on injection drug use.

WHAT'S SLOWING IMPLEMENTATION OF EVIDENCE-BASED TOBACCO, ALCOHOL, AND OPIOID USE TREATMENT IN HIV CLINICS?

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Treatment
Abstract Category: Original Research

Aim: Screening and treatments for substance use disorders (SUD) involving tobacco, alcohol and opioids are inconsistently provided in HIV clinics. To inform implementation efforts to promote adoption of these practices, we conducted focus groups across four diverse HIV clinics in the US northeast.

Methods: From July 2017–February 2019, we conducted focus groups at HIV clinics in Brooklyn, NY; New Haven and Hartford, CT; and Providence, RI. We purposefully invited individuals employed at the participating clinics who may directly provide or facilitate referral for SUD treatment. Data collection and analysis were grounded by the Promoting Action on Research Implementation in Health Services Research framework to capture perspectives on evidence for SUD treatment and context for treatment delivery to inform future facilitation efforts. We used directed content analysis to identify themes.

Results: Participants (n=37) included 48% potential prescribers (i.e., physicians, nurse practitioners, physician assistants). Regarding evidence: 1) tobacco and opioid use were perceived as a threat to health among patients with HIV; alcohol use was of lower concern; 2) providers within and across clinics had varied approaches to SUD screening and follow-up; 3) most prescribers reported limited experience and/or self-efficacy with treatment medications. Regarding context: 1) quality improvement was routine, SUD was not a common focus; 2) availability of SUD-related programs varied over time based on funding; 3) absence of a local champion limited treatment availability; 4) opioid prescribing practices for pain were linked to perceived OUD treatment need; and 5) onsite SUD treatment was typically integrated on the clinic rather than provider level.

Conclusions: Efforts to implement screening and treatments for SUD within HIV clinics will require a multi-faceted facilitation approach targeting providers (e.g., promoting provider self-efficacy, education of alcohol's harmful effects and treatment options) and clinic level (e.g., routine screening, audit and feedback, resources) factors.

ASSOCIATION BETWEEN PUBLIC INJECTION AND SYRINGE SHARING FREQUENCY IN A COHORT OF PEOPLE WHO INJECT DRUGS IN SAN FRANCISCO AND LOS ANGELES

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research

Aim: People who inject drugs (PWID) in public have a higher risk of homelessness, incarceration, rushed injection, and overdose than people who do not inject drugs in public. There is limited research on the relationship between public injection and syringe sharing, a risk factor for infectious diseases. The aim of this study was to investigate longitudinal associations between frequency of public injection and syringe sharing among PWID in San Francisco and Los Angeles, California.

Methods: PWID (N=984) were recruited using targeted sampling and completed surveys during three study visits (baseline, 6-month, and 12-month) in 2016 and 2017. The explanatory variable was frequency of having injected in public (never, occasionally/sometimes, or usually/always), and the outcome variable was number of times having used syringes that had already been used by someone else in the past six months. Explanatory and outcome variables were measured across all three timepoints. We used a longitudinal negative binomial mixed-effects model to assess the relationship of interest.

Results: At baseline, 78% of participants had injected publicly in the past six months, with 38% of the sample reporting that they usually/always injected publicly. Over a quarter (26%) had injected with a previously used syringe in the six months preceding baseline, with an average of 20.9 instances of receptive syringe sharing during this period. The majority (83%) reported current homelessness at baseline. In multivariable analysis across all timepoints, participants who usually/always injected publicly had 1.71 (95% CI: 1.30, 2.24) times higher counts of receptive syringe sharing over the past six months, compared to those who never publicly injected, controlling for age, gender, homelessness, stimulant injecting, opioid injecting, and binge drinking.

Conclusions: Usually/always injecting publicly is associated with a higher frequency of receptive syringe sharing among PWID, suggesting the need for safer environment interventions, such as supervised consumption sites.

METHADONE MAINTENANCE TREATMENT AND ASSOCIATIONS WITH HCV INCIDENCE AMONG A COHORT OF PEOPLE WITH OPIOID USE DISORDER IN NEW YORK CITY, 2013-2016

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Epidemiology
Abstract Category: Original Research

Aim: Methadone maintenance treatment (MMT) has been shown to reduce HCV acquisition by approximately 50%. Yet those on MMT remain at HCV risk due to ongoing risk behaviors. Specific aspects of MMT, particularly average methadone dose and MMT retention, have been understudied for their impact on HCV prevention.

Methods: In a retrospective observational open cohort study of patients in an MMT in New York City among 2,535 seronegative at first HCV antibody test (4,859 person-years of observation (PYO)), factors, including average methadone dose and measures of MMT retention, were examined for their association with HCV incidence and time-to-HCV-infection.

Results: The overall cohort incidence rate was 2.5/100 person-years of observation (PYO); 6.7/100 PYO among those reporting drug injection. Lower MMT retention (i.e. more days not

on MMT) was significantly associated with a higher HCV incidence rate ratio (IRR) (IRR: 1.01, 95% CI: 1.01, 1.02). Incidence was slightly higher among those whose average methadone doses were <60mg compared to those with doses > 60 mg (IRR: 1.44, 95% CI: .97, 2.13). Lower MMT retention was slightly associated with a longer time-to-HCV-seroconversion (adjusted hazard ratio (aHR): 1.01, 95% CI: 1.00, 1.02). In multivariate Cox proportional hazards analyses, methadone dose of <60mg (aHR: 1.52, 95% CI: 1.03, 2.24) was independently associated with shorter time-to-HCV seroconversion.

Conclusions: The finding that average methadone doses of <60 mg were significantly associated with a shorter time to HCV seroconversion, and the finding that lower MMT retention was associated with a higher incidence rate ratio, add to the modest literature identifying these associations. The observed HCV incidence among those MMT were lower than those generally observed among out-of-treatment people who inject drugs consistent with an important role of MMT on HCV control and that the potentially modifiable factors, methadone dose and retention could be leveraged to further improve MMT's impact as HCV prevention.

SUBSTANCE USE DISORDER AS A PREDICTOR OF CLIENT SATISFACTION OF COMMUNITY HEALTH WORKER SERVICES AMONG PEOPLE LIVING WITH HIV

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Abstract Detail: Human
Drug Category: Other, Substance Use Disorder (including club/designer drugs, marijuana/cannabinoids, opiates/opioids, and/or stimulants)
Topic: HIV/Immune
Abstract Category: Original Research

Aim: Community health workers (CHWs) integrated into HIV care teams can play an important role in managing complex cases, especially for individuals with substance use disorders (SUD). However, little is known about how people living with HIV (PLWH) and SUD perceive the quality of services they receive from CHWs, which may ultimately impact treatment adherence and outcomes.

Methods: Self-reported indicators of perceived quality of CHW services (5-point Likert scale) were collected from participants at 6 and 12 months since the onset of working with a CHW across 10 Ryan White HIV/AIDS Program (RWHAP) sites in the United States. Chi-square and Fisher's exact tests were used to examine the relationship between having a SUD diagnosis and perceived quality of CHW services.

Results: 32.4% (n=69) of participants had a dual diagnosis of HIV and SUD compared to 67.6% (n=144) without a SUD diagnosis. At 6 months, compared to participants without SUD, participants with SUD were significantly less likely to report the explanations CHWs gave participants about their conditions were "very good" (82.4% vs 66.2%; p=.029) and

significantly more likely to report them as "poor" or "very poor" (0.7% vs 7.7%; p=.029). Similarly, the quality of information CHWs gave participants about their medications was reported as "very good" significantly more by participants without SUD than with SUD (78.0% vs 61.9%; p=.032). Similar trends persisted at 12 months but did not reach statistical significance. No significant differences were found concerning the quality of instructions CHWs gave participants regarding follow-up care at both 6 and 12 months.

Conclusions: PLWH who experience a dual diagnosis of HIV and SUD perceive a lower quality of CHW services than those without SUD. Further research is needed to investigate the possible reasons for this difference and to explore consequences, if any, on treatment adherence and outcomes.

TRAJECTORIES OF SELF-REPORTED OPIOID USE AND MORTALITY PROGNOSIS FOR PATIENTS LIVING WITH HIV AND ENGAGED IN CARE

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: HIV/Immune
Abstract Category: Original Research
Aim: Opioids have myriad physiologic effects among individuals with HIV, yet it is less clear whether and how opioid use is associated with mortality prognosis. We sought to characterize patterns of self-reported opioid use and the Veterans Aging Cohort Study (VACS) Index 2.0 ("VACS Index"), a validated mortality prognostic tool, among a sample of patients with HIV (PWH) engaged in care.

Methods: Survey data between 2002 and 2018 on 3,330 VACS participants was analyzed for a total of 21,254 person-years of observation. We used joint-trajectory modeling to group patients into trajectories of two contemporaneous longitudinal measures: self-reported opioid use and VACS Index. Multinomial logistic regression was then used to estimate the odds of membership within each VACS Index trajectory group by opioid trajectory, after conditioning on covariates.

Results: Trajectory modeling classified 21% of PWH in a low (i.e., lower risk of mortality), 40% in a moderate, 27% in a high, and 12% in an extremely high VACS Index trajectory. PWH with a high or extremely high trajectory were more likely to report non-white race/ethnicity, lower education level, never married marital status, lower income, current smoking status, and cancer compared to PWH in the moderate VACS trajectory. Compared to those within the moderate VACS Index trajectory, PWH with an extremely high VACS Index trajectory were more likely to report a high frequency of opioid use at baseline followed by de-escalating use (adjusted odds ratio [AOR]: 4.38, 95% confidence interval [CI]: 1.84-10.44), and less likely to report no lifetime use (AOR: 0.21, 95% CI: 0.14-0.32) versus stable, infrequent use of opioids.

Conclusions: Individuals with HIV who report a high frequency of opioid use have an increased mortality risk over time, even when the frequency of opioid use de-escalates. Screening for opioid use should be standardized and considered as a risk factor for mortality.

Opioids

SOMETHING TO DESPAIR: GENDER DIFFERENCES IN ADVERSE CHILDHOOD EXPERIENCES AMONG RURAL PATIENTS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research
Aim: Existing research has demonstrated that patients in treatment for opioid use disorder (OUD) have high rates of adverse childhood experiences (ACE) compared to community-based samples. While important gender differences in ACEs have been documented in urban samples, less is known about gender differences in rural and Appalachian areas. The purpose of this study is to identify gender differences in ACE scores in patients receiving OUD treatment in rural Appalachia.
Methods: A secondary analysis of existing clinical data was conducted utilizing intake assessment data from a rural Appalachian addiction treatment program located in West Virginia (WV). The sample included patients with OUD who presented for treatment between June 2018 and June 2019 (n=173). The clinical intake assessment included a modified 17-item ACE instrument that was self-administered by clients.
Results: The mean client age was 36.0 years old and 50.0% were female. Overall, 84.9% and 73.7% of clients reported past use of prescription opioids (mean age of first use 19.4 years old) and heroin (mean age of first use 23.3 years old), respectively. More than half (54.3%) of clients reported 4+ categories of adverse experiences. On average, females endorsed 4.5 categories of adverse experiences whereas males had 3.3 (p<0.01); female clients were significantly more likely to have experienced sexual abuse (42.4% versus 10.6%, p<0.01). Alarmingly, 25.9% of females and 8.2% of males reported having been forced to have sex before age 18. In addition, the prevalence of childhood adversities was significantly higher in this rural sample of clients with OUD when compared to previous reports among non-rural patients receiving treatment for OUD, as well as when compared to WV and national studies.
Conclusions: Disproportionately high rates of childhood adversities, particularly among females, may partially explain despair in rural Appalachian areas. Addiction treatment programs should consider integrating trauma screening and trauma-informed services, especially for female clients.

INCREASED BUPRENORPHINE DOSE ASSOCIATED WITH DECREASED CRAVING AND OPIATE USE SEVERITY IN A NATURALISTIC PROSPECTIVE SETTING

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Abstract Detail: Human
Drug Category: Opiates/Opioids

Topic: Treatment

Abstract Category: Original Research

Aim: To explore the association between buprenorphine dose, craving, opiate use and addiction severity in opiate use disorder individuals.

Methods: Samples of individuals initiating outpatient buprenorphine treatment for opiate use disorder were selected from the prospective open Addiction Aquitaine Cohort (ADDICTAQUI, Bordeaux, France). Assessments conducted prospectively at baseline, 3, 6, and every 6 months thereafter included Addiction Severity Index, DSM-5 criteria, and past 30-days craving intensity/frequency. Factors associated with buprenorphine dose at 12 months were tested by Pearson correlation coefficient or ANOVA. Within-person association between buprenorphine dose, opiate craving, use and addiction severity were tested using hierarchical linear and non-linear models (HLM).

Results: Between-person analysis showed that buprenorphine dose at 12 months was significantly higher in individuals with higher addiction severity at baseline (r= 0.249, p= 0.021) and at 12 months (r= 0.483, p< 0.001). The within-person analysis showed that, for an individual, an increase of buprenorphine dose was associated with a decrease of craving intensity (γ =-0.214, p=0.015) and opiate use (γ =-0.196, p<0.001) during the same follow-up assessment period.

Conclusions: In the context of this naturalistic prospective setting, buprenorphine doses were associated with severity of addiction. The within-person associations between increased buprenorphine dose, decreased craving and decreased opiate use have implications for buprenorphine dose guidance. Further studies should determine whether craving is the mediator of the buprenorphine dose and opiate use association.

THE RELATIONSHIP BETWEEN OPIOID USE DISORDERS AND SOCIAL CONNECTION

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Abstract Detail: Human

Drug Category: Opiates/Opioids

Topic: Epidemiology

Abstract Category: Original Research

Aim: The purpose of this study was to assess the associations of various relevant social constructs and opioid use disorders (OUD) among a nationally representative sample. Additionally, we assessed associations of suicidal behaviors and treatment utilization with socially-relevant constructs among those with an OUD.

Methods: We extracted demographic, diagnostic, treatment utilization, and social variables of adults 18+ years from the 2008-2017 National Survey of Drug Use and Health. (N = 398,967). A binomial logistic regression analyses assessed the associations of severity of social difficulties with OUD after accounting for key demographic and clinical variables. A secondary set of analyses within those with an OUD (n = 5,095) assessed the associations of the socially-relevant variables as correlates of suicidal behaviors and treatment utilization.

Results: We found that never being married (adjusted Odds Ratio [aOR] = 1.92) and severe difficulties participating in social activities (aOR = 2.88) and not participating in social activities (aOR = 2.43) were significantly associated with having an OUD after accounting for key covariates, such as past-year major depressive episode, having worse overall health, and

having an alcohol use disorder. Among those with an OUD, greater severity of difficulties participating in social activities were associated with higher odds of endorsing past-year suicidal ideation (aOR for not participating in social activities = 2.27), and lower odds of engaging in mental health treatment (aOR for not participating in social activities = 0.28). Difficulty participating in social activities was not associated with suicide attempts.

Conclusions: These data suggest that those with an OUD commonly experience severe social impairment even after accounting for key covariates. Additionally, greater interference in the participation of social activities may also affect treatment seeking and increase risk for suicidal behaviors among individuals with an OUD.

MEASURING SEXUAL RISK-TAKING: A SYSTEMATIC REVIEW OF THE SEXUAL DELAY DISCOUNTING TASK WITH A FOCUS ON DRUG ADMINISTRATION

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Abstract Detail: Human
Drug Category: Other, Alcohol, Cocaine, Buspirone
Topic: Behavior
Abstract Category: Literature Review
Aim: Substance use facilitates HIV and STI incidence by increasing risky sexual behaviors (e.g., unprotected sex). The Sexual Delay Discounting Task (SDDT; Johnson & Bruner, 2012) is a laboratory task capturing sexual risk-taking by measuring likelihood of condom use in various casual sex scenarios when condom availability is delayed. The SDDT has high ecological validity as a model of real-life sexual risk-taking and has been used to test effects of substances on sexual risk-taking. Standardization in administration, data analysis, and reporting across studies is important to the generalizability of results from tasks such as the SDDT.

Methods: We conducted a systematic review comparing use of the SDDT across studies to assess possible discrepancies in its implementation and implications for understanding associated results. This review utilized both citation tracking and a comprehensive literature search to retrieve studies that had used the SDDT instrument, yielding 17 peer-reviewed articles.

Results: Overall, results indicate acute substance administration is linked to lower likelihood of condom use and a preference for immediate sex without a condom, compared to a placebo. This effect is observed inconsistently across administered substances including cocaine, alcohol, and buspirone. Participants who are dependent on substances exhibit lower likelihood of available condom use and greater delay discounting when compared to non-dependent or recreational user populations.

Conclusions: These trends suggest that risky sexual behavior and substance use may be linked in a way that can be reliably measured by using the SDDT. Additionally, there remain notable differences in the implementation and data analysis of the SDDT, including lack of uniform criteria to determine outliers. Results from studies using the SDDT may help to determine the role of acute and non-acute substance use in facilitating the spread of HIV and other STIs. Further, these findings have the potential to inform development of behavioral interventions that simultaneously address substance use and sexual behavior.

KRATOM USE IN PATIENTS TREATED FOR SUBSTANCE USE DISORDERS

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Abstract Detail: Human
Drug Category: Other, Kratom
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: There is growing evidence of Kratom use in the substance use disorders population, but the prevalence of Kratom use in patients actively being treated for a substance use disorder is unknown. It is also unclear whether the frequency of Kratom use is highest in patients with opioid use disorder, and whether Kratom is primarily used to treat opioid withdrawal symptoms.

Methods: Subjects were receiving treatment for a substance use disorder and were recruited from detox and rehab facilities, outpatient clinic, and consults on the inpatient service. Respondents voluntarily answered a 10 minute survey about the presence of Kratom use, use frequency, use amount, reason for use, and adverse effects. We used SPSS to calculate descriptive statistics. The primary outcome measure was frequency of Kratom use in patients with a substance use disorder. The secondary outcome measures were reason for use of Kratom and presence of adverse effects of Kratom.

Results: There were 98 respondents and the majority of the participants were Caucasian and male (67%), with a mean age of 38 years (SD=11 years). 34% (20/59) of respondents with opioid use disorder had tried Kratom, whereas 10% (3/30) of respondents with alcohol use disorder had tried Kratom. Additionally, 39% (10/26) of respondents stated they used Kratom to decrease withdrawal symptoms, 31% (8/26) as a recreational drug, and only 12% (3/26) to decrease pain. The most common side effects of Kratom were sedation (46%), nausea (35%), change in appetite (31%), and withdrawal symptoms (23%).

Conclusions: Patients being treated for opioid use disorder were the most likely to have tried Kratom, and most respondents said they used Kratom to decrease withdrawal symptoms, or as a recreational drug. It was difficult to quantify the amount of Kratom used. The most common side effects of Kratom were sedation, nausea, change in appetite, and withdrawal symptoms.

GENDER DIFFERENCES IN THE ASSOCIATION BETWEEN LEVEL OF SMOKING, EXECUTIVE FUNCTIONING AND COGNITIVE–AFFECTIVE MOTIVES FOR SMOKING MAINTENANCE IN AFRICAN AMERICAN DAILY SMOKERS

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Abstract Detail: Human
Drug Category: Nicotine/Tobacco
Topic: Sex Differences
Abstract Category: Original Research

Aim: Approximately 50% of African American (AA) smokers are light smokers (LS; smoke less than 10 cigarettes daily). Furthermore, AA females are more likely to be LS than females of other races. Even though AAs smoke fewer cigarettes, begin smoking later in life, have lower nicotine dependence, and make more attempts to quit than other races, AAs still have

lower cessation rates, relapse faster, and have more severe tobacco-related harm. Often trials exclude LS, thus there is a need for more studies that identify cognitive-affective factors salient to the lower successful smoking cessation rates in AAs, and the LS subgroup. This study explored factors associated with abstinence duration and stress-related urges within AAs overall and the LS female subgroup.

Methods: A sample of 224 (60.7% male) AA adult, daily cigarette smokers completed the study via Mturk. Measures of smoking abstinence and dependence, affect, and urge to smoke were completed before and after the PASAT-C (a stress inducing task that is an index of working memory, interference control, sustained attention, and processing speed).

Results: There was a stronger urge to smoke post stress task compared to baseline, with LS having significantly less increase in urges than moderate and heavy smokers (p<.001). For LS females, abstinence duration was most associated with discrimination (p<.05), and smoking urges were most associated with automaticity (p<.05). In males, there was a significant effect of level of smoking on PASAT scores, F(2,222)=4.664, p=.010, heavy smokers had significantly better performance on PASAT than light smokers. Whereas in females, no significant difference was seen for level of smoking on PASAT scores.

Conclusions: Results from this study suggest that particularly for males, cognitive enhancement may play an important role in smoking maintenance to strengthen executive functions. Whereas, discrimination and automaticity were the salient cognitive-affective factors contributing to smoking maintenance in females.

THE ADRENERGIC α2 RECEPTOR-MEDIATED DISCRIMINATIVE-STIMULUS EFFECTS OF MITRAGYNINE, THE PRIMARY KRATOM (MITRAGYNA SPECIOSA) ALKALOID IN RATS

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Abstract Detail: Animal Study
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: The primary kratom alkaloid mitragynine has received attention due to its opioid pharmacology, while several effects of mitragynine, including its discriminative stimulus and rate-decreasing effects, have not been consistently blocked by the opioid antagonists naloxone and naltrexone. In contrast, the antinociceptive effects of mitragynine were blocked by the α2 antagonist idazoxan.

Methods: The present study examined the opioid and α2 pharmacology of mitragynine with radioligand binding in cell membranes and drug discrimination in rats.

Results: The affinity of mitragynine at the μ-opioid receptor (Ki=706nM) was 2-, 10-, 9- and 5-fold higher than its affinity at the kappa-, delta-opioid, and alpha2A and alpha2C receptors, respectively, labelled with [3H]DAMGO, [3H]U69593, [3H]DADLE, [3H]RX821002 and [3H]RX821002. In rats discriminating mitragynine (32mg/kg, i.p.), its ED50 value to produce mitragynine-lever responding was 16mg/kg. The kappa-, delta-, and μ-opioid receptor agonists SNC80, U69,593, and morphine, respectively, produced no greater than 60% mitragynine-lever responding. The alpha2 agonists lofexidine and clonidine produced 74% and 45% mitragynine-lever responding, respectively; the alpha2 antagonists yohimbine and atipamezole

produced 40% and 46% mitragynine-lever responding, respectively. Yohimbine (3.2mg/kg) and naltrexone (0.032mg/kg) antagonized the mitragynine discriminative-stimulus, i.e., increased its ED50 by 2- and 5-fold, respectively. Lofexidine (0.1mg/kg) and clonidine (0.32mg/kg) reduced the ED50 of the mitragynine discriminative-stimulus by 9- and 5-fold, respectively. In separate groups of rats discriminating either morphine (3.2mg/kg) or lofexidine (0.032mg/kg), mitragynine produced 72% morphine- and 100% lofexidine-lever responding (ED50s=11 and 15mg/kg). In the morphine-trained rats, 0.032mg/kg naltrexone produced an 8-fold rightward shift in the morphine discrimination dose-effect function. In contrast, yohimbine, lofexidine and clonidine produced no more than a 2-fold change in the morphine discrimination ED50.

Conclusions: Mitragynine had comparable binding affinity at opioid and alpha2 receptors in the micromolar range in vitro, and appeared to exhibit comparable μ-opioid and alpha2 receptor agonist activity in vivo.

OPIOID WITHDRAWAL: WHEN A DAY MAKES A DIFFERENCE

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: As fatalities due to opioid use disorder continue to increase, hospitalization presents an opportunity to engage patients in addiction treatment. There is also a need to address withdrawal in these patients, to ensure completion of medical care and adequate follow up. Initiation of medications for opioid use disorder (MOUD) has been one strategy to decrease mortality related to opioid use disorder (Hassamal et al., 2017). Emergency department-administered buprenorphine has improved patient outcomes after discharge (D'Onofrio et al., 2017). However, prompt control of cravings and withdrawal during hospital admissions is necessary to optimize patient comfort and avoid patient-directed discharge (PDD, previously against medical advice). This study seeks to evaluate the effect of the introduction of an opioid withdrawal protocol (OWP) in reducing delays to delivering treatment with methadone to inpatients with opioid withdrawal.

Methods: The OWP was introduced in mid-2018 to support physicians in a large university hospital in initiating methadone for withdrawal without specialty consultation. Inclusion criteria were all inpatients who received methadone (<31mg/day) during the 12 months before (n=691) and 12 months after (n=712) OWP introduction (total n=1403). Outcome measures were number of individuals started on methadone for opioid withdrawal within 24 hours of admission and the number of PDDs.

Results: Patients were primarily white (72.5%), mean age 39 with roughly equal representation of males and females; no significant demographic differences pre- and post-intervention. Chi-square analyses crossing OWP introduction with doses received within 24 hours and PDDs were conducted. Individuals admitted after OWP introduction were more likely to receive a dose of methadone within 24 hours of hospital admission, (37.9% vs 41.1%, p=0.046). However, there was no effect on likelihood of PDDs, (40.6% vs. 39.9%, p=0.085).

Conclusions: Future directions for this initiative will include motivational interviewing training and other strategies to reduce PDD rates, as well as investigating other forms of MOUD.

A RECURRENT GLM METHOD FOR PREDICTION OF OPIOID RELAPSE AND POSITIVE URINE TEST IN CTN STUDIES

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research
Aim: We benchmark a precision predictive model to utilize patients' characteristics and their longitudinal behavior patterns to predict future opioid use in opioid secession treatment.
Methods: The method is demonstrated with the data from National Drug Abuse Treatment Clinical Trials Network Study CTN-051. In this study, 570 participants were randomly assigned (1:1) to extended-release naltrexone (XR-NTX) and buprenorphine-naloxone (BUP-NX) during 24 weeks of outpatient treatment. Urine drug screen (UDS) data were collected during weekly visits. We built a forecasting model for Relapse and Positive Urine Test for Opioids (UDS+) in the next week with a series of recurrent generalized linear regressions (GLM). Each of the GLM includes baseline demographics (age, gender, ethnic), treatment, week, number of former UDS+, number of former missing scheduled visits, as well as interactions of treatment and the other predictors. We used GEE with autoregressive correlation structure to handle repeated measurements of each subject. We split the participants into 7:3 training and testing samples and assessed prediction accuracy by Receiver Operating Curve on the testing samples.
Results: We included inducted patients with more than 3 weeks of follow-up (n=416). On the testing data set, prediction for relapse achieved a testing Area Under Curve (AUC) of 68% and prediction of UDS+ had a testing AUC 81%. Using XR-NTX was not a significant predictor of Relapse but was significantly less likely to have UDS+ (p=0.024, OR=0.086). Number of former missed visits is predictive for Relapse (p<0.0001). For both outcomes, the week is a significant predictor (p<0.01). The probabilities increase with more former UDS+ (p<0.000001), with the BUP-NX group having steeper increases for the UDS+. Females had less predicted UDS+ (p=0.0448, OR=0.49).
Conclusions: The recurrent GLM methods is a flexible method that captures important time-varying personalized features to achieve high prediction accuracies in opioid cessation treatment

EVALUATING THE CONTENT VALIDITY OF OPIOID CRAVING ASSESSMENTS USING QUALITATIVE DATA

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Abstract Detail: Human
Drug Category: Opiates/Opioids

Topic: Other

Abstract Category: Original Research

Aim: There is no universally accepted assessment of opioid craving for treatment outcome studies or clinical trials. However, craving is a formal DSM-5 criterion and a commonly reported feature of opioid use disorder (OUD). This study collected patient-reported information via Amazon Mechanical Turk (AMT) from individuals with regular opioid use to identify constructs that characterize opioid craving.

Methods: Forty-three participants completed an online screener on AMT and met inclusion criteria (i.e., >=18 years old and past 30 day illicit opioid use). These participants completed a series of closed- and open-ended questions about their opioid use and craving. Responses to the open-ended question "What do you mean when you say you are craving opioids?" were coded according to subscales of existing, commonly-used opioid craving assessments (i.e., Heroin Craving Questionnaire, Desires for Drug Questionnaire, and the Obsessive-Compulsive Drug Use Scale).

Results: In response to the open-ended question, participants described craving as (1) thoughts and interference (n=11), (2) anticipation of negative reinforcement (n=11), (3) anticipation of positive reinforcement (n=6), (4) lack of control (n=6), and (5) desire and intention (n=5). Constructs not included in commonly used assessments, but regularly discussed in open-ended responses included: craving is (1) a "need" (n=11), (2) restlessness/anxiety (n=10), and (3) withdrawal symptoms (e.g., chills, body ache, nausea; n=10). Individuals with higher OUD scores described craving as withdrawal symptoms (40% v. 9%) more often than those with lower scores (DSM-5 Criteria >=6 v. <6)

Conclusions: These data suggest opioid craving is a multidimensional construct including dimensions currently not included in common craving assessments. A comprehensive multidimensional craving assessment may improve the validity and reliability of opioid craving assessments in clinical trials. Improving opioid craving assessments is critical in better understanding the relationship between craving and opioid use, relapse, and intervention effectiveness.

EXAMINING SUCROSE SUBJECTIVE RESPONSE AMONG INDIVIDUALS WITH OPIOID USE DISORDER

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Abstract Detail: Human

Drug Category: Opiates/Opioids

Topic: Substance Use Disorder

Abstract Category: Original Research

Aim: While opioid agonists represent the most efficacious treatment for opioid use disorder (OUD), preclinical and clinical data suggest they may enhance subjective response to sweet flavors. In this laboratory study, we examined sucrose subjective response among adults receiving OAT and a comparison sample without OUD.

Methods: Forty adults receiving buprenorphine or methadone for OUD (OUD+) and 40 adults without OUD (OUD-) completed an intake assessing eating behaviors, diet, nutrition and body mass index. Participants completed outpatient sessions during which they sampled six experimenter-administered sucrose solutions (0, 0.1, 0.25, 0.5, 0.75, 1.0M), each three times, under double-blind counterbalanced conditions and rated the pleasantness and intensity of each sample using 100-point visual analog scales.

Results: OUD+ participants presented with a higher prevalence of obesity, food insecurity, unhealthy eating behaviors, high sugar consumption, and nutrition knowledge deficits vs. OUD- participants (p's<0.05). They rated sucrose solutions as less pleasant than OUD- participants (p<0.001), though this effect was limited to the three lowest sucrose concentrations (0, 0.1, 0.25M). There were no group differences on ratings of intensity (p=0.35). A change from baseline (placebo) analysis indicated a higher magnitude of change in pleasantness ratings and a lower magnitude of change in intensity ratings from 0M in OUD+ vs. OUD- participants (p's<0.05).

Conclusions: Group differences in subjective sucrose response were generally modest, with OUD+ participants showing less liking of essentially unsweet solutions. Group differences were far more pronounced in participants' eating behaviors and nutrition knowledge, with OUD+ participants presenting with a consistently more severe profile. These data highlight the significant risk factors experienced by OUD+ individuals that extend beyond drug-related risks and may inform future scientific and clinical efforts to improve health outcomes in this vulnerable population.

POTENTIAL YEARS LIFE LOST DUE TO OPIOID-INVOLVED OVERDOSE IN SOUTH CAROLINA

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: South Carolina experienced significant increases in drug overdose deaths from 2013 to 2017, as well as all opioid and synthetic opioid-involved deaths from 2016 to 2017. Using state-level data, we evaluated the potential years of life lost (PYLL) due to all opioid and fentanyl use from 2014 to 2018 and measured the effect of opioid-involved overdose deaths on the lifespan of South Carolinians.

Methods: Opioid and fentanyl-involved overdose deaths of individuals over the age of 18 that occurred in South Carolina from January 1, 2014 to December 31, 2018 (N = 3037) were derived from death certificates registered with the state's Department of Health and Environmental Control (DHEC) Vital Statistics and reported by the Department of Alcohol and Other Drug Abuse Services (DAODAS). Modeled on the work of Hall et al. (2019), we calculated the burden of fatal opioid and fentanyl-involved overdoses as PYLL using life expectancy data derived from the Social Security Administration's Period Life Table as well as the effect of opioid and fentanyl-involved overdose deaths on average lifespan.

Results: Between 2014 and 2018, the average age of opioid-involved overdose deaths decreased from 44.9 + 12.9 to 41.9 + 13.2, resulting in 111,614 PYLL and the average age of fentanyl-involved overdose deaths decreased from 41.3 + 12.9 to 38.4 + 12.0. Fentanyl use contributed to an increasing proportion of PYLL, from accounting for 14.8% of PYLL in 2014 to 61.1% in 2018. In 2018, opioids reduced the lifespan of South Carolinians by 0.60 years, with fentanyl alone reducing lifespan by 0.34 years.

Conclusions: Fatal opioid-involved overdoses are increasingly affecting younger individuals. These overdoses accounted for over 111,000 PYLL over a 5-year period and reduced the

lifespan of South Carolinians by over half a year. Fentanyl-involved overdoses increasingly contributed to the excess mortality experienced in the state.

EXAMINING THE FACTOR STRUCTURE OF THE CONNOR-DAVIDSON RESILIENCE SCALE IN A SAMPLE OF INDIVIDUALS WITH OPIOID USE DISORDER

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Resilience is a trait defined as the capacity for an individual to maintain normal functioning and resist the development of psychiatric disorders in response to stress and trauma. Previous studies have implicated adversity and dysfunctional stress management, and impaired stress response in the development and maintenance of substance use disorders (SUD). Thus, further exploration of trait resilience in populations with SUDs may provide greater insight into the protective and risk factors involved in addiction. The objective of the present study was to investigate the reliability, validity, and factorial structure of the Connor-Davidson Resilience Scale (CD-RISC-25) within a sample of individuals with opioid use disorder (OUD).
Methods: These data were collected as part of a trial investigating overdose education and peer-based naloxone distribution targeting people with OUD. As part of the study procedures, participants completed a battery of measures including the CD-RISC-25 (range: 0-100). A confirmatory factor analysis (CFA) was conducted to assess whether the five-factor analytic structure initially suggested in the CD-RISC-25 validation study could be replicated.
Results: The sample consisted of 303 individuals with OUD (24% female); 46% not currently seeking treatment, 42% receiving agonist maintenance pharmacotherapies, and 12% recently detoxified. The sample had a mean duration of OUD of 15.7 years (SD=11.4). The mean CD-RISC-25 risk score was 75.3 (SD=15.9). The CFA revealed five factors (personal competence and tenacity, tolerance of negative affect and strengthening effects of stress, positive acceptance of change and secure relationships, control, and spiritual influences), replicating the validation study findings; model fit: χ^2 (265) =656.0, p<.001.
Conclusions: This is the first study to evaluate the factor structure of the CD-RISC measure in individuals with OUD. The current study replicated the factor structure found in the initial validation of the CD-RISC, suggesting it is a reliable and valid tool to use in OUD populations.

INVESTIGATING THE NEUROPROTECTIVE EFFICACY AND MECHANISM OF ACTION OF KRATOM ALKALOID MITRAGYNINE IN CHEMOTHERAPY-INDUCED PERIPHERAL NEUROPATHY

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Abstract Detail: Animal Study

Drug Category: Opiates/Opioids
Topic: Alternative Medicine
Abstract Category: Original Research

Aim: Mitragyna speciosa, also known as kratom, is a coffee-like plant containing a variety of biologically active alkaloids, with mitragynine being the most prevalent. Mitragynine has a mixed pharmacological profile, consisting of both opioid and stimulant-like effects. The goal of this study is to investigate the neuroprotective efficacy of mitragynine in a model of chemotherapy-induced peripheral neuropathy (CIPN). The overall hypothesis is that mitragynine alleviates neuropathic pain by enhancing adrenergic neurotransmission at alpha-2 adrenoceptors.

Methods: Baseline mechanical sensitivity was assayed in male and female C57/BL6 mice (20-25 g) with Von Frey filaments (0.07–2.0 g) on day 0, followed by a single injection of oxaliplatin (6 mg/kg, IP) or vehicle. Mice received either mitragynine (1-10 mg/kg, IP) or vehicle once daily for 7 days. Antagonist pretreatment groups received either naltrexone or yohimbine (1-10 mg/kg, IP) 15 minutes prior to mitragynine or vehicle administration. Mechanical allodynia was assessed on days 2, 5, and 7. On day 7, mice were perfused with ice cold PBS and 4% paraformaldehyde. Brains and lumbar spinal cords were harvested to investigate cellular markers of chemotherapy-induced peripheral neuropathy through immunohistochemistry.

Results: Results indicate that mitragynine dose-dependently increases paw withdrawal threshold in the Von Frey assay in both males and females. Naltrexone and yohimbine pretreatment blocks mitragynine's anti-allodynic effect, indicating involvement of the mu-opioid and alpha-2 adrenoceptor systems. Immunohistochemical analysis suggests mitragynine impacts cellular markers of oxaliplatin-induced peripheral neuropathy, with less Iba1 and GFAP-positive cells in periaqueductal gray and lumbar dorsal horn sections.

Conclusions: Mitragynine alleviates mechanical allodynia in a dose-dependent manner, with no observable sex difference in neuroprotective efficacy. This effect is blocked by mu-opioid and alpha-2 adrenoceptor antagonists naltrexone and yohimbine. Immunohistochemistry indicates mitragynine plays a role in modulating cellular markers of CIPN associated with nociception and descending pain modulation.

DISCRIMINATIVE STIMULUS EFFECTS OF FENTANYL ANALOGS

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Abstract Detail: Animal Study
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: Fentanyl analogs present a public health problem. Increasing use of these compounds has been observed as substitutes for illicit heroin use or for oxycontin prescriptions, with an associated increase in the number of overdose deaths. The morphine-like interoceptive effects of 13 fentanyl analogs were tested.

Methods: The discriminative stimulus effects of para-fluorobutyryl fentanyl, cis-3-methylbutyryl fentanyl, ocfentanil, para-methoxy fentanyl, para-chloroisobutyryl fentanyl, cyclopentyl fentanyl, ortho-fluorobutyryl fentanyl, valeryl fentanyl, isobutyryl fentanyl, 2,2,3,3-tetramethyl-cyclopropyl fentanyl, ortho-methyl acetylfentanyl, β'-phenyl fentanyl, and

para-methyl fentanyl were tested in male, Sprague-Dawley rats trained to discriminate morphine from saline.

Results: 2,2,3,3-Tetramethyl-cyclopropyl fentanyl failed to produce morphine-like discriminative stimulus effects. The remaining compounds fully substituted for the discriminative stimulus effects of morphine with potencies between those of fentanyl and morphine.

Conclusions: Most of the fentanyl analogs produced morphine-like interoceptive effects and have the potential to be used as substitutes for legal and illegal opioids. Because most of these substances share similar mechanism of action with fentanyl and morphine, and because 10 of the 13 were more potent than morphine, they have the potential for inadvertent overdose.

USING BIG DATA IN ETHICAL WAYS TO ADDRESS THE OPIOID EPIDEMIC: INSIGHTS FROM DATA SCIENTISTS, POLICYMAKERS, AND PATIENT ADVOCATES

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Policy
Abstract Category: Original Research

Aim: The opioid epidemic has enabled rapid and unsurpassed use of big data on people with opioid use disorder for public health purposes, generally without adequate input from impacted communities. This big data effort is saving lives. It may also undermine public trust in government and cause other unintended harms. We aimed to identify how to use big data on opioid use in ethical ways.

Methods: We conducted qualitative analysis of data provided by focus groups and interviews with 40 big data stakeholders (gatekeepers, scientists, patient advocates) in Massachusetts in 2018-2019.

Results: Concerns regarding big data on opioid use are rooted in potential privacy infringements due to linkage of previously distinct data systems, increased profiling and surveillance capabilities, limitless lifespan, and lack of explicit informed consent. Also problematic is the inability of affected groups to control how big data is used, and the potential of big data to increase stigmatization and discrimination of affected groups despite data anonymization. Recommendations for ethical big data use underscore the need to: (1) protect and respect patients and society (e.g., create community advisory boards; consider big data rights), (2) ensure justice (e.g., prioritize health equity; set off-limits topics/methods; recognize blind spots), and (3) foster patient and public trust in public institutions (e.g., institute ethical oversight, gatekeeping, other safeguards; recognize big data as a public good).

Conclusions: Using big data to address the opioid epidemic poses significant ethical concerns that, if unaddressed, may undermine its benefits. Findings can inform policies and practices for ensuring ethical big data governance.

Polysubstance

PROFILES OF POLYSUBSTANCE USE AND ASSOCIATED MULTIMORBIDITY AMONG CURRENT MARIJUANA USERS IN THE UNITED STATES: A POPULATION-BASED STUDY

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research
Aim: Marijuana users represent a heterogeneous subpopulation and have higher rates of substance use than the general population. The aim of this study is to empirically derive patterns of polysubstance use in a nationally representative sample of current cannabis users and to observe the psychiatric and medical factors that differentiate these patterns.
Methods: Data from NSDUH (2015–2017) was used in a latent class analysis of polysubstance use among current (past 30-day) marijuana users (n= 15,751). A multinomial logistic regression was used to examine the relationship between class membership and morbidity-related factors. Substance use indicators included marijuana use intensity (1-9, 10-19, $\geq$ 20/30 days), use of alcohol, cigarette, cocaine, crack, heroin, methamphetamine, prescription opioid misuse, stimulant misuse, and tranquilizer misuse (coded as: never used, use beyond past 30 days, use within past 30 days). All analyses accounted for survey weights and design.
Results: The prevalence of current marijuana use was 8.9%. Marijuana users were significantly more likely to use all substances compared to non-users. A 4-class model provided optimal fit: Alcohol + infrequent marijuana use (ETOH; 57%), Alcohol + medication misuse (ETOH+MEDS; 19%), Alcohol + past heroin, crack and cocaine (ETOH+PAST; 15%), and a class characterized by the highest rates of current use across all substances (POLY; 8%). Among other effects, past year medical marijuana use (AOR= .70, p<.05), depression (AOR= 1.08, p<.01), suicidal ideation (AOR= 1.58, p<.01) and factors related to socioeconomic disadvantage differentiated POLY from ETOH in the adjusted model.
Conclusions: More than 40% of marijuana users in the United States evidence patterns of past and/or current polysubstance use in addition to alcohol and tobacco. In assessing the effects of marijuana on population health, the complex interplay of marijuana, other substance use and multimorbidity should be considered. Such efforts may be important to informing marijuana regulatory science and public policy.

USE OF METHAMPHETAMINE AND ALCOHOL AMONG PEOPLE WITH OPIOID USE DISORDER AND HIV IN VIETNAM

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Injection drug use (IDU) is a key driver of HIV transmission in Vietnam. While heroin opioid use disorder (OUD) is the dominant drug of choice, concomitant use of methamphetamine and alcohol is increasing. We sought to understand patient perspectives of polysubstance use during OUD treatment.
Methods: We conducted face-to-face qualitative interviews with people living with HIV and OUD enrolled in the BRAVO study comparing clinic-based buprenorphine versus methadone referral in four HIV clinics in Vietnam. Participants were interviewed at baseline (n=44) and 12 months following enrollment (n=26). Interviews probed patient experiences with substance use and inquired about patients' methamphetamine and alcohol use. Interviews were professionally transcribed, coded in Vietnamese, and analyzed using a qualitative thematic analysis approach.
Results: Several themes emerged: 1) Participants who used methamphetamine or alcohol framed their use not as addiction but rather as either within their control or a normal part of life; 2) Most participants who use methamphetamine or alcohol report doing so in social settings with friends who also used drugs and with family, especially in circumstances such as weddings, death anniversaries, and Tet, when it can be socially unacceptable to refuse alcohol; 3) Participants viewed methamphetamine use as a way to decrease heroin use, though some felt it increased their desire to use heroin. Participants held similarly ambivalent attitudes with regards to the effect of alcohol on their heroin use. Themes remained constant over time.
Conclusions: Polysubstance use among patients with HIV and OUD in Vietnam is rooted in complex beliefs and social contexts that, contrary to perceptions, may not support well-being and recovery from OUD. Improved messaging about the harms of methamphetamine and alcohol are indicated as the population of people receiving OUD treatment increases in Vietnam and globally.

PREDICTORS OF EMPLOYMENT IN A TREATMENT SAMPLE OF INDIVIDUALS WITH SUBSTANCE USE DISORDERS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Job-seekers workshops (JSW) studies have previously been found to increase employment among participants in SUD treatment. A recent RCT through the NIDA CTN found no differences in employment outcomes between the JSW and control group (SC) and lower rates of employment overall. The present study examined job-seeking behaviors (JSB) across the JSW and SC to determine if the JSW intervention produced greater JSB despite the lack of positive employment findings and also examined if intervention dose was enough to produce positive employment outcome for those in JSW group who attended all 3 JSW sessions than those who attended fewer sessions.
Methods: Participants were N=628 individuals in SUD treatment who participated in the CTN RCT comparing JSW to SC. The JSW group completed a 3-session format (12 hr total) training

(e.g. completing a job application, conduct a job interview).Chi-square analyses were performed to examine characteristics between JSW and SC participants on JSB. Logistic regression was run to determine whether JSW session attendance predicted employment in JSW group

Results: Participants had an average age of 41.12(SD=10.71)year and 53% were female and predominantly white (40%) and African-American (38.9%).Chi-square tests found no significant JSW and SC group differences on each of JSB at 6-month follow-up (all p>.05). These activities included looking at ads in the newspaper (85.6% vs 86.9%) submitting a job application (78.9%vs. 84.2%) and talking with friends (73.8%vs.75.3%). Logistic regression analysis found as the number of sessions attended increases by JSW participants, the odds of becoming employed increases with 1.44 time, $\chi2$ (1, N=299)=18.07,OR=1.46,95%CI=[1.225, 1.756],p=.001

Conclusions: The present study found JSB activities reported were similar for both groups. JSW intervention dose was related to the likelihood of employment at a 6-month follow-up. Future research should look more closely at barriers to employment and how to better measure client motivation to get a job.

MOOD AND ANXIETY RELATED DISORDERS AMONG INDIVIDUALS WITH OPIOID USE DISORDER PARTICIPATING IN A MULTISITE RANDOMIZED TRIAL: COMPARISON OF SELF-REPORTED HISTORY VERSUS STANDARDIZED DIAGNOSTIC INTERVIEW

Megan E. Curtis[1], *Caroline Yoo*[2], *Larissa J. Mooney*[3], *Petra Jacobs*[4], *Abigail Matthews*[5], *David Liu*[4], *Andrew Saxon*[6], *Yih-Ing Hser*[7]

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: Many individuals with opioid use disorder (OUD) have co-morbid mental health problems. Assessments of mental health disorder nevertheless often rely on self-reported history of having been treated for or diagnosed with a mental health disorder, in lieu of using a standardized diagnostic assessment. The aim of this secondary data analysis from the NIDA CTN-0050 clinical trial compares participants' self-reported history of anxiety, depression, and bipolar disorder with diagnoses obtained on a structured diagnostic interview, the Mini-International Neuropsychiatric Interview (MINI).

Methods: A total of 723 OUD participants completed baseline self-reported measures and the MINI at the follow-up visit (>2 years from baseline). The self-report surveys asked for mental health treatment and history, and the MINI assessed for current diagnoses of anxiety disorders and current and lifetime diagnoses of bipolar disorder and major depressive disorder (MDD). We evaluated specificity and sensitivity of agreement between the two measures.

Results: Using MINI as the gold standard, 46.1% of the sample was diagnosed with current anxiety disorder, 27.1% bipolar, and 22.7% MDD. Compared to the MINI, self-report sensitivity for anxiety was 38.7%, specificity was 77.4%, positive predictive value (PPV) was

59.4%, and negative predictive value (NPV) was 59.7%. For bipolar disorder, self-report sensitivity was 29.6%, specificity 92.0%, PPV 58.0%, and NPV was 77.8%. Self-report sensitivity for MDD was 34.8%, specificity 76.7%, PPV 30.5%, and NPV was 80.0%. Kappa for these diagnoses ranged .17 to .26.

Conclusions: This work confirms prior findings demonstrating high rates of co-occurring psychiatric disorders among patients presenting for OUD treatment. Agreement with self-reported mental health history and the MINI was less than fair for all mood and anxiety disorders among these OUD participants. Further research needs to elucidate reasons for discrepancies in both directions (e.g., underreporting and overreporting) in order to guide the utilities and interpretations of these assessments.

ASSOCIATION BETWEEN BENZODIAZEPINE PRESCRIPTION, OPIOID USE DISORDER, AND MORTALITY AMONG PATIENTS IN A LARGE HEALTHCARE SYSTEM

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Abstract Detail: Human
Drug Category: Sedative-Hypnotics
Topic: Substance Use Disorder
Abstract Category: Original Research

Aim: Co-prescription of opioids and benzodiazepines (BDZ) is associated with adverse outcomes including greater healthcare utilization and overdose risk. The aim of this study is to examine mortality among patients with opioid use disorder (OUD) who are also prescribed BDZ.

Methods: Using data from the California state Prescription Drug Monitoring Program (PDMP) linked with a large healthcare system electronic health record (EHR) database and mortality records from the Centers for Disease Control (CDC) National Death Index, this study examined 4,369 patients (1781 with OUD, 2588 controls) with at least one opioid prescription from 2010-2014. Pairwise comparisons and multiple logistic regression analyses were conducted to examine relationships between BDZ prescription, OUD, and their interaction with respect to mortality.

Results: 21% of the sample (n=920) were prescribed BDZ during the last month of follow-up. Higher average BDZ dose was prescribed among decedents in the sample compared to those who were still alive at follow-up: 3.1mg (SD=9.6) vs. 1.1mg (SD=5.3) diazepam-equivalents/day (p<0.001). More individuals with OUD were prescribed BDZ in the final month of follow-up than those without OUD [n=499 (28%) vs. n=421 (16%), p<0.001], and at higher average BDZ doses [21.3mg (SD=111.5) vs. 5.1mg (SD=33.8), p<0.001]. Individuals with or without OUD who received BDZ in the final month of follow-up had the highest mortality, and among those without BDZ prescriptions, individuals with OUD had higher mortality than those without; the interaction of OUD diagnosis and BDZ prescription was significant (p<0.001).

Conclusions: This work extends prior findings demonstrating high opioid-BDZ co-prescription in a general healthcare setting and of BDZ prescription in individuals with OUD. Study findings highlight significant mortality associated with BDZ prescription and BDZ dose, even among individuals without OUD. Further research is needed to elucidate factors associated with mortality among individuals prescribed BDZ.

FIRST EXPERIENCE OF USING WINGS (WOMEN INITIATING NEW GOALS OF SAFETY) INTERVENTION TO PREVENT GENDER BASED VIOLENCE AGAINST FEMALE SEX WORKERS AND WOMEN WHO USE DRUGS IN UKRAINE

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Prevention
Abstract Category: Original Research

Aim: Female sex workers (FSWs) are the highest risk group for gender-based violence (GBV) [1; 2]. According to research in Ukraine, 76% of FSW who use drugs experienced violence. FSW who were subjected to sexual abuse also faced verbal abuse (69.5%), threats (50.1%) and forced labor (49.5%); a third were beaten (38.3%); a quarter (24.3%) were raped [3]. GBV disproportionately affects FSW and women who use drugs (WUD). WINGS is an intervention and a therapeutic tool to identify GBV among WUD, which enables them to develop security planning strategies, to strengthen social support network, to identify and access various services to reduce the risk of GBV.

Methods: WINGS was conducted with two groups who hadn't had the experience of the WINGS sessions – WUD and FSWs. During the session, the women received a questionnaire, which is one of the tools of the session. The questionnaire collected information about the goals that the participant had set up and her needs for redirection for assistance and services. These data were used to compare with the data of a previous poll. Participants were asked whether the selected goals and needs were fulfilled. The choices included 15 goals and 12 needs, but women chose those that were most applicable for them. Follow-up interviews were conducted 1 month after the intervention.

Results: 100% of the participants reported having benefited from WINGS. Participants' feedback was received on how taking part in the intervention affected future violence. The majority of participants reported that the most important service for solving their urgent needs was received.

Conclusions: The project developed a gender-sensitive organizational capacity by adapting the WINGS methodology to improve access to HIV services and counter GBV among WUD and FSWs in Kyiv, Ukraine.

RISK FACTORS FOR CO-USE OF MARIJUANA AND PRESCRIPTION PAIN MEDICATIONS AMONG COMMUNITY MEMBERS IN NORTH CENTRAL FLORIDA

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research

Aim: Reports indicate an increasing use of marijuana being used with prescription pain medications to manage pain. Further, findings indicate elevated psychiatric comorbidity such

as anxiety and depression. Research is needed to identify risk factors for past 30-day (P30D) co-use of prescription pain medication and marijuana.

Methods: Our community engagement model at the University of Florida, HealthStreet, utilizes Community Health Workers to evaluate health and demographic information of individuals across North Central Florida. P30D use of prescription pain medications and marijuana was assessed by asking "Have you used [substance] in the last 30 days?" Participants were classified as either P30D prescription pain medication users only, or co-users (prescription pain medications with marijuana). We assessed the association between each variable and our outcome of interest (prescription pain medication users only VS co-users). We controlled for sex, age, education (<=12 years, >12 years), race (black, white, other), marital status, employment, social support, and psychiatric comorbidity (none, anxiety or depression, anxiety and depression) in our logistic regression model.

Results: Since January 2017, among 3136 community members, 211 individuals (55% female, 31% black, mean age= 51 years) reported using prescription pain medications in the P30D; 34% were co-users and 66% only used prescription pain medications. Notably, only being younger was associated with co-use (vs prescription pain medication use only). Other demographic factors, social support, and number of psychiatric conditions were not associated with co-use.

Conclusions: These findings emphasize the importance of research on younger individuals as a population especially susceptible to harm from co-use of prescription pain medications and marijuana. Since our findings do not align with the current literature, additional research is needed on the relationship between psychiatric conditions and co-use of these substances.

NALOXONE IS LESS EFFECTIVE AT REVERSING THE CARDIOVASCULAR EFFECTS OF FENTANYL-METHAMPHETAMINE MIXTURES THAN FENTANYL ALONE

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Abstract Detail: Animal Study
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Drug Interactions
Abstract Category: Original Research

Aim: Over the past 10 years, opioid-related deaths have increased exponentially, however, overdose deaths attributed to stimulants (e.g., cocaine, methamphetamine) have also increased sharply in recent years. Moreover, there is a growing realization that a large number of these deaths involved both opioids and stimulants. Despite these alarming trends, little is known about the toxidrome of mixtures of opioids and stimulants. The current studies aimed to characterize the cardiovascular effects of opioids, stimulants, and opioid + stimulant mixtures, and to determine the effectiveness of naloxone to reverse these effects.

Methods: Male Sprague Dawley rats were implanted with a pressure sensing radiotelemetric probe, and a femoral catheter to allow for drug delivery. Dose-response curves for the effects of fentanyl (0.001-0.56 mg/kg), and methamphetamine (0.1-3.2 mg/kg) on heart rate and blood pressure were generated prior to evaluating the effects of a mixture of fentanyl (0.56 mg/kg) and methamphetamine (1 mg/kg). Finally, naloxone (1 mg/kg) was administered as a 5-min post-treatment in order to determine its effectiveness to reverse the cardiovascular effects of fentanyl, methamphetamine, and mixtures of fentanyl + methamphetamine.

Results: Fentanyl produced a dose-related bradycardia and hypotension, whereas methamphetamine produced a dose-related tachycardia and hypertension. When co-administered fentanyl and methamphetamine produced a robust bradycardia and hypotension. Naloxone rapidly reversed the cardiovascular effects of fentanyl, but was less effective and/or potent at reversing the cardiovascular effects of a mixture of fentanyl + methamphetamine.

Conclusions: Together, these studies suggest that concurrent use of opioids (fentanyl) and stimulants (methamphetamine) can result in an enhanced cardiovascular response. In addition, although naloxone produced a rapid and full reversal of fentanyl's cardiovascular effects, the fact that it was unable to reverse the effects of a mixture of fentanyl + methamphetamine suggests that alternate strategies are needed to address the growing number of overdoses related to co-use of opioids and methamphetamine.

DISORDERED EATING BEHAVIOR IS PREDICTIVE OF VAPING AMONG WOMEN, BUT NOT MEN, WHEN CONTROLLING FOR THE USE OF OTHER SUBSTANCES

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Abstract Detail: Human
Drug Category: Other, E-cigarettes/Vaping
Topic: Epidemiology
Abstract Category: Original Research
Aim: Despite use of e-cigarettes to control weight, as well as the rising popularity of e-cigarette use among college students, the relationship between disordered eating behaviors and the use of e-cigarettes among college students is not well-defined. This study aims to examine the prevalence and types of disordered eating behaviors associated with the use of e-cigarettes among college students.

Methods: This secondary analysis of cross-sectional data utilizes a nationally representative sample of 31,750 students from 79 institutions who participated in the 2018-2019 Healthy Minds Study and provided complete data related to disordered eating behavior and past 30-day use of an electronic cigarette or vape pen. Adjusted logistic regression analyses were used to explore the relationship between disordered eating behavior and e-cigarette use.

Results: Of 31,750 HMS participants, 17.1% (n=5,441) reported using an e-cigarettes in the past 30 days. After adjusting for demographic, psychiatric, and behavioral characteristics, students reporting two or more disordered eating behaviors were 13% more likely to endorse NMUPS than those endorsing fewer than two disordered eating behaviors (AOR: 1.13, 95% CI:[1.04,1.23]). After stratifying by gender, females reporting two or more disordered eating behaviors were 20% more likely to endorse NMUPS than those endorsing fewer than two disordered eating behaviors (AOR: 1.20, 95% CI:[1.10,1.32]) and an increased number of disordered eating behaviors was associated with higher odds of e-cigarette use. However, for nearly all disordered eating behaviors, the odds of disordered eating did not differ between males using e-cigarettes and those who did not.

Conclusions: Vaping may be part of the risky disordered eating behavior engaged in by students experiencing eating disorder psychopathology. Further exploration of specific behavioral connections with vaping is necessary and is likely to be influenced by marketing materials for e-cigarettes.

ELICITING INFORMATION ON PATTERNS OF POLY SUBSTANCE USE TO GUIDE DEVELOPMENT OF RODENT MODELS: PHASE 1 OF A R21/R33 TRIAL

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Behavior
Abstract Category: Original Research
Aim: To explore best methods for eliciting past 30-day patterns, sequence, quantity, frequency and duration of poly substance use.
Methods: We conducted 13 focus group discussions (FGDs) with adults 18 to 65 years of age who reported concurrent use of cocaine with alcohol and/or marijuana in the past 30 days. All participants were recruited from the community through community outreach, fliers and word-of-mouth. A written informed consent was obtained from all participants; all FGDs were audio recorded, transcribed and analyzed using the qualitative data analysis software Atlas Ti™.
Results: We had a total of 34 cocaine users, (age ranging from 19-63, 68% male, and 59% minority) participate in the FGDs. Majority of the participants reported concurrent use of cocaine, alcohol and marijuana regularly. Marijuana is the most commonly reported drug along with cocaine. Binge poly substance use was reported by all. Quantity and type of substance used depend on the cash available. Participants reported that they would be able to accurately recall and report their days and frequency of cocaine, marijuana and alcohol use when a past 30-day calendar was shown. They also confirmed that they were able to pick a typical day from the past 30-days to report detailed poly substance use patterns including timing, sequence, quantity, duration and route of use for different poly substance use combinations and specific times of the day. We also shared questions with the participants to see if they understood what we are asking. A sample of the instrument will be shown during the presentation.
Conclusions: Using the survey instrument we developed through the FGDs, we will be able to collect detailed information on poly substance use patterns and differentiating concurrent, simultaneous, and sequential poly substance use. The test re-test reliability of the instrument will be tested through the ongoing phase 2 study.

CHARACTERISTICS OF CIGARETTE USE AMONG ADULTS ENROLLED IN TREATMENT FOR CANNABIS USE DISORDER

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Treatment
Abstract Category: Original Research
Aim: Individuals seeking treatment for cannabis use disorders (CUD) frequently report concurrent cigarette smoking, and smoking is associated with poorer outcomes during treatment for CUD, yet mechanisms underlying how cigarette use may impact CUD outcomes remain unclear. The aim of this secondary analysis was to evaluate whether baseline cigarette

smoking characteristics were predictive of cannabis withdrawal-related symptoms and treatment response for adults enrolled in treatment for CUD.

Methods: 127 adults were enrolled in a 12-week clinical trial of CUD treatment and randomized to receive extended-release zolpidem or placebo. All received computerized therapy and abstinence-based contingency management verified by twice-weekly urine screens. Timeline follow-back assessments characterized cannabis and tobacco use at intake and weekly during treatment. The Marijuana Withdrawal Checklist (MWC), ambulatory polysomnography (PSG), and self-reported sleep assessments measured cannabis withdrawal-related symptoms, including sleep disturbance. The Marijuana Problems Scale (MPS) assessed cannabis-related problems at intake and end-of-treatment (EoT). Regression and repeated-measures ANOVA tested whether cigarette smoking differentiated participant baseline characteristics, cannabis withdrawal, and treatment response.

Results: 56% (71/127) of the sample were cigarette smokers, and reported using 5.6 + 5.2 cigarettes per day. At baseline, cigarette smokers reported an earlier age of cannabis initiation (14.3 vs. 15.8, p<.05) and greater self-reported withdrawal-related sleep disturbances (p<.05). However, cigarette smokers did not differ from non-smokers on cannabis use quantity/frequency, other substance use, or cannabis-related problems. Cigarette use did not differentiate treatment retention or cannabis abstinence. However, cigarette smokers showed qualitatively greater improvements in self-reported sleep disturbance at EoT relative to baseline.

Conclusions: Cigarette smoking characteristics at baseline were associated with baseline differences in severity of withdrawal-related sleep disturbance and cannabis age of onset, but smoking did not impact cannabis abstinence during treatment. Accounting for cigarette use during treatment may improve outcomes for interventions targeting CUD-related sleep disturbances.

POLYSUBSTANCE USE IN RURAL WEST VIRGINIA: ASSOCIATIONS BETWEEN LATENT CLASSES OF DRUG USE, OVERDOSE, AND TAKE-HOME NALOXONE

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research
Aim: Rural communities in the United States have been disproportionately affected by the opioid crisis. Little research has explored the relationship between polysubstance use and overdose experiences among people who inject drugs (PWID) in rural communities. We sought to identify classes of polysubstance drug use among rural PWID and evaluate the associations between polysubstance drug use classes, recent overdose experiences, and receipt of take-home naloxone (THN).
Methods: We surveyed 420 PWID (June-July 2018) who had injected drugs in the previous 6 months in Cabell County, West Virginia. Participants were recruited from the local syringe services program and through street-based recruitment. We conducted a latent class analysis using 9 measures of injection and non-injection drug use and tested for associations with having experienced an overdose in the past 6 months and having received THN in the past 6 months.

Results: We identified four substance use classes in our sample: polydrug/polyroute use (35.0% of the sample), polyroute stimulant/injection opioid use (33.3%), polyroute stimulant use (20.3%), and injection opioid use (11.3%). Overall, 42.6% of the sample had experienced an overdose in the past 6 months. The classes differed in terms of overdose (χ=91.53, p<0.001), with the polydrug/polyroute use class having the highest probability of overdose and the polyroute stimulants class having the lowest. Only 46.5% of participants had received THN, and probabilities differed between classes (χ=21.93, p<0.001). The polyroute stimulants/injection opioid use and polydrug/polyroute use classes had the highest levels of THN receipt while the polyroute stimulants use class had the least.

Conclusions: Among rural PWID in West Virginia, polysubstance use was prevalent and associated with overdose and THN acquisition. These analyses demonstrate the importance of scaling up naloxone distribution in rural settings. Overdose prevention initiatives are reaching persons at high risk of overdose, but expansion of services is needed.

GENDER DISCRIMINATION AND MULTIPLE DRUG USE AMONG AFRICAN AMERICAN AND EUROPEAN AMERICAN FEMALES

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research
Aim: AIMS
Gender discrimination among females has been linked to illicit drug use. Its relationship with multiple drug use, along with mothers' experiences of gender discrimination have not been explored. We examined associations of both mothers and daughters experiences with gender discrimination with daughters multiple drug use in a sample of African American (AA) and European American (EA) females.

Methods: METHODS.
Data (n=735) are extracted for female participants from the Missouri Family study (MOFAM) (n=1,461), a longitudinal high-risk family study of AA and EA adolescents and young adults. Multinomial logistic regression analyses were conducted to test the association between gender discrimination (daughters and mothers) and using two or more illicit drugs (lifetime) verses using one drug. Psychosocial and psychiatric risk factors including childhood sexual abuse, major depressive disorder, conduct disorder, prior alcohol use along with controls (age, family risk, income, education) were included in the analyses.

Results: RESULTS
Overall, 35.1% of females reported lifetime gender discrimination, 17.1% used 2 or more drugs, and 11.3% used 3 or more drugs, and 7.8% use 4 or more drugs. Among those who reported multiple drug use, 24.4% reported gender discrimination versus 13.2% who did not (χ2=14.81; p<.001). Gender discrimination among daughters was associated with a higher odds of reporting 2 or more drugs (RRR: 2.33 [95% CI: 1.40 -3.86; p=.00]) versus (χ2=11.13; p=.01) one drug (RRR: 1.60 [95% CI: 1.02 -2.51; p..04]). Mothers report of discrimination also was associated with higher odds of daughters reporting of 2 or more drugs (RRR: 2.44 [95% CI: 1.21 -4.89; p=.02) versus (χ2=6.40; p=.04) one drug (RRR: 1.31 [95% CI: 0.68-2.53; p=.42]).

Conclusions: Further work on socialization of gender discrimination experiences should be considered between mothers and daughters. Addiction treatment providers and clinicians should consider querying females on experiences such as gender discrimination, as multiple drug use has severe adverse consequences.

PSYCHOSOCIAL PROBLEMS IN US ADULTS WITH ALCOHOL USE AND CANNABIS USE, 2012-2013

Sarah Gutkind*[1], Dvora Shmulewitz[2], David Fink[1], Malka Stohl[3], Deborah Hasin[2]

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Epidemiology
Abstract Category: Original Research

Aim: Given the changing US cannabis landscape, whether drinking or non-medical cannabis use is more harmful is debated, with little empirical evidence. We compared the risk for interpersonal, financial, legal, and health-related problems between binge alcohol drinkers (BU-only), non-medical cannabis users (CU-only) and BU+CU; and between those with DSM-5 alcohol use disorder (AUD-only), cannabis use disorder (CUD-only) and AUD+CUD.

Methods: US adults age ≥ 18 (N=36,309) participated in the 2012-2013 National Epidemiologic Survey on Alcohol and Related Conditions-III. BU, CU, AUD, CUD, and problems (interpersonal, financial, legal, health-related) were assessed with the Alcohol Use Disorder and Associated Disabilities Interview Schedule. Odds ratios and 95% confidence intervals (CI) were derived from logistic regression models of the problems as a function of BU, CU, AUD and CUD, controlling for demographic covariates.

Results: Those with BU-only or CU-only did not differ in the likelihood of financial, legal, or health-related problems. Those with CU-only were more likely to have problems with a neighbor/relative/friend (aOR=1.53, CI=1.17-2.00) while those with BU-only were more likely to be divorced (aOR=0.64, CI=0.49-0.83). Those with BU+CU were significantly more likely to have financial and legal problems then non-users, BU-only and CU-only groups. Few differences were found between AUD-only and CUD-only groups. Those with AUD+CUD were significantly more likely to have all four types of problems than those with AUD-only, but were more likely to have problems only with boss/co-workers than those with CUD-only (aOR=1.96, CI=1.28-2.98).

Conclusions: Problems were associated with binge drinking and cannabis use, and AUD and CUD, without evidence that one was "worse." While cross-sectional associations cannot demonstrate causality, this study provided no indication that cannabis use is benign relative to alcohol. However, participants with co-morbid binge drinking and cannabis use had greater risk of many problems than users of one substance or the other.

COCAINE USE AND URINARY COTININE DURING INTERIM BUPRENORPHINE TREATMENT

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[1]*University of Vermont*

Abstract Detail: Human

Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Drug Interactions
Abstract Category: Original Research
Aim: Prior studies with primary stimulant users have demonstrated that cocaine use is associated with increases in cigarette smoking, perhaps due to a pharmacological interaction whereby stimulants increase nicotine's reinforcing effects. However less is known about whether this association also occurs among individuals maintained on opioid agonist medication for treatment of opioid use disorder (OUD).
Methods: Among opioid-dependent adults randomized to receive interim buprenorphine treatment in the context of two ongoing 6-month randomized controlled trials, we identified current smokers who provided >1 cocaine-positive urine specimens. Semi-quantitative urinary levels of the nicotine metabolite, cotinine, were examined for specimens that tested positive vs. negative for cocaine. Reported here are preliminary results from this ongoing trial. Final analyses using a linear mixed modelling approach will be presented at the June 2020 meeting.
Results: Participants (n=12) were 33.8±10.1 years old, 67% male and reported smoking 15.8±8.2 cigarettes per day. At study intake, participants reported having used cocaine regularly for 9.8±8.9 years and on 3.8±4.9 of the 30 days prior to intake. During the 6-month study, participants provided an average of 17.4±8.9 urine specimens, with 45% and 55% testing positive vs. negative for cocaine, respectively. Preliminary analyses indicate higher mean urinary cotinine levels in cocaine-positive (M=1408.7±595.8 ng/ml) vs. cocaine-negative (M=1125.2±653.6 ng/ml) urine specimens.
Conclusions: Preliminary data suggest that cocaine use may be associated with increases in cigarette smoking among adults receiving buprenorphine maintenance treatment for OUD. Analyses from the final study sample, as well as a comparison sample of smokers without a history of stimulant use, will be available in full for the June 2020 meeting.

EFFECT OF PRIOR ALCOHOL EXPOSURE ON COCAINE SELF-ADMINISTRATION IN RHESUS MONKEYS

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Abstract Detail: Animal Study
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Behavior
Abstract Category: Original Research
Aim: Most cocaine users also abuse alcohol, but little is known about the mechanisms that promote co-abuse. These studies in rhesus monkeys compared the acquisition of cocaine self-administration in monkeys with or without a history of chronic, binge-like alcohol drinking. Involvement of dopamine D2 and D3 receptors was assessed using [11C]raclopride PET imaging and a quinpirole-induced yawning assay.
Methods: Six monkeys drank a sweetened, 4% ethanol (EtOH) solution five days per week while the remaining six drank an equivalent of sweetened water and self-administered food pellets under a fixed-ratio schedule. EtOH access was provided 2-3 hours after the behavioral session. After six months of EtOH drinking, saline or single doses of cocaine (0.001-0.3 mg/kg/injection, i.v) were substituted for food pellets in ascending order. Once a dose was reached that functioned as a reinforcer (number of injections significantly greater than during saline availability), a full dose-effect curve was constructed.

Results: No significant differences were found in the dose at which monkeys acquired cocaine self-administration, the ED50 of the initial cocaine dose-effect curve, or the overall cocaine intake. Additionally, no significant between-group differences were found in the percent change of D2 receptor availability assessed by [11C]raclopride scans. Initial ED50 of quinpirole induced yawning response curves were negatively correlated with the dose of cocaine self-administration acquisition (r=-0.54).

Conclusions: These results suggest that alcohol exposure—even at binge-like levels of consumption—does not affect initial sensitivity to cocaine or the initial effects of cocaine on D2 receptors. A modest negative correlation between D3 receptor availability and the dose at which monkeys acquired the cocaine self-administration behavior reinforces past reports of the role of D3 receptor availability in cocaine reinforcement. Future studies will continue the assessment of cocaine-EtOH interactions as monkeys self-administer one or both drugs over one year.

ASSOCIATION OF THE FUNCTIONAL REPEAT POLYMORPHISM IN THE PROMOTER OF THE SEROTONIN TRANSPORTER GENE WITH COCAINE EXPOSURE AND ESCALATION OF COCAINE USE IN A EUROPEAN COHORT

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Abstract Detail: Human
Drug Category: Stimulants
Topic: Genetics
Abstract Category: Original Research
Aim: The serotonin transporter (SERT) gene SLC6A4 has a functional tandem repeat polymorphism in its promoter (rs4795541), thought to affect transcription. The Aim of this study is to examine if this polymorphism is associated with dimensional aspects of drug exposure in a cohort of European ancestry.

Methods: The protocol was approved by the Institutional Review Board; adult male and female participants from the Netherlands signed informed consent. Three groups were examined: A. Participants with opioid dependence diagnosis (OD; DSM-IV criteria) (n=174) in methadone maintenance; B. Participants who had abused opioids, but never met OD diagnosis criteria (NOD; n=150); C. Healthy controls (HC; n=111). Exposure to heroin, cocaine and alcohol were also measured dimensionally by KMSK scales. Time of escalation was defined as the interval between age of first use and onset of heaviest use of a drug. The SLC6A4 polymorphism was genotyped as: "long-long" [LL], "short-long" [SL], and "short-short" [SS], based on the number of repeats, and analyzed with the "S" allele in dominant mode. The "S" is allele is thought to result in decreased transcription.

Results: SLC6A4 genotype ([LL] versus [SL+SS]) was not associated with categorical opioid dependence diagnoses. Analyses with KMSK scales revealed that OD and NOD groups had considerable exposure to cocaine and alcohol. Cocaine exposure scores were lower in participants with the [LL] versus [SL+SS] genotype overall (p<0.05). Heroin and alcohol scores did not differ by genotype. The [LL] genotype was associated with lower odds of a cocaine KMSK score ≥"cutpoint" for a cocaine dependence diagnosis, versus [SL+SS] (p<0.03; Fisher's test). The time of cocaine escalation was also slower in the [LL] versus [SL+SS] genotype (p<0.05; Log-rank test).

Conclusions: The functional promoter variant "SS", in the gene encoding SERT, resulting in decreased transcription, was associated with greater cocaine exposure, and with more rapid escalation of cocaine use.

RANDOMIZED CONTROLLED TRIAL OF GROUP MOTIVATIONAL INTERVIEWING FOR HOMELESS VETERANS WITH SUBSTANCE USE DISORDERS

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Treatment
Abstract Category: Original Research
Aim: Homeless Veterans with substance use disorders (SUDs) represent one of the largest, most chronically ill groups of psychiatric patients treated within the VA. We evaluated the effectiveness of Group Motivational Interviewing (GMI), an understudied adaptation of motivational interviewing, among this population.
Methods: 184 homeless male and female Veterans meeting criteria for current SUDs were randomly assigned to 4 sessions of GMI or to a control condition, Life Skills Education Group (LSEG), and evaluated out to 6 months. 65% of the sample had co-occurring psychiatric disorders. Primary outcomes evaluated SUD and general MH treatment engagement, substance use behavior, and community participation using the TLFB. Differences in mean outcomes between GMI and LSEG were examined using negative binomial models (for treatment engagement and community participation) and Marginalized two-part models (for substance use behavior).
Results: GMI was statistically superior compared to LSEG for enhancing SUD treatment attendance, general MH session attendance (in the VA outpatient setting), and 12-step session attendance in the community [all p values < .001] at 6-mos. f/u. All participants in GMI and LSEG reduced illicit drug use days from baseline, although significant differences favored GMI at 3 mos. f/u (p <.05) while the primary end point at 6-mos. f/u favored LSEG for drug use (p <.01). LSEG was superior to GMI for enhancing community participation at 1-mos. f/u (p <.05), but conditions were NS at any other f/u. Participants in both GMI and LSEG reduced alcohol consumption (in standard drinks per day) and hazardous binge drinking days from baseline at all f/u's, but were NS different on alcohol consumption.
Conclusions: GMI can be use in a group format for enhancing treatment engagement and lowering substance use among homeless Veterans with SUDs and may be offered to larger numbers of patients with SUDs who would otherwise not receive this intervention.

DUAL SUBSTANCE USE BY PEERS AND EFFECTS ON SOLDIERS' SUBSTANCE MISUSE

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)

Topic: Epidemiology

Abstract Category: Original Research

Aim: Previous research has demonstrated the effect of peers' heavy drinking on soldiers' alcohol use problems. However, given the reality of polysubstance use, research is warranted to examine the effects of peers' dual substance use. This study describes the overlap of peers' substance use and its effect on soldiers' illicit drug use and alcohol use problems.

Methods: Data are from Operation: SAFETY, a study of the health of Army Reserve and National Guard soldiers (n=413 current soldiers). Soldier outcomes were any past-three-month illicit drug use and current alcohol use problems. Peer dual substance use was indicated by both past-year use of illicit drugs and heavy drinking. Regression analyses examined the effects of peers' single substance use (heavy-drinking only or illicit drugs only) and dual use on soldier alcohol and drug use.

Results: Approximately 9% of soldiers had peers with dual substance use, 17% of soldiers had peers who used illicit drugs only, and 24% had peers with heavy-drinking only. Soldiers' illicit drug use was associated with peers who used illicit drugs only (p <.05). Peers with heavy-drinking only and peers who used both substances were associated with soldiers' alcohol use problems (ps <.01).

Conclusions: Approximately 1 in 10 soldiers had a social network that included peer polysubstance use, a rate that is quite high given the illicit nature of one of the two substances in question. Soldiers with illicit drug and polysubstance use in their networks appear to be at higher risk for their own substance misuse, and interventions should focus on highlighting the risks of interpersonal influence on soldiers' substance use. Future research should examine the overlap of peers' substance use and military affiliation, to assess whether substance use might be a coping mechanism among soldiers, and whether multiple substances are used simultaneously or at separate times.

CANNABIDIOL INHIBITION OF DELTA-9-TETRAHYDROCANNABINOL-INDUCED ANTINOCICEPTION IN MALE VS. FEMALE RATS WITH CHRONIC INFLAMMATORY PAIN

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Abstract Detail: Animal Study

Drug Category: Marijuana/Cannabinoids

Topic: Drug Interactions

Abstract Category: Original Research

Aim: Antinociceptive synergy between cannabidiol (CBD) and delta-9-tetrahydrocannbinol (THC) has been demonstrated in male mice with neuropathic pain. Given that THC has been shown to be more potent in female rats compared to males, the purpose of this study was to compare CBD-THC interactions in male and female rats, and to determine whether synergy occurs in a model of persistent inflammatory pain.

Methods: Sprague Dawley rats, 60-90 days old were used (n=4-9/sex/dose). Inflammation was induced by intraplantar injection of complete Freund's adjuvant (CFA). Based on the ED50 value derived from a dose-effect curve for THC alone and lack of effect when CBD was given alone in a previous study, the following CBD:THC dose ratios were tested: 1:3, 1:1, and 3:1. THC alone (0, 0.1, 2.0 mg/kg, in combination with vehicle) was also tested. CBD:THC combinations were given i.p. twice daily at approximately 0800 and 1700, for 4 days, starting

one h post-CFA. Mechanical allodynia, heat hyperalgesia, biased weight-bearing, and locomotor activity were assessed 30-240 min after the 0800 injection on the 4th day.

Results: THC alone reduced allodynia and paw thickness in both sexes, but did not alter weight-bearing on the inflamed paw or locomotor activity. THC also reduced sensitivity to noxious heat in females but not males. CBD blocked THC-induced reductions in heat sensitivity in females as well as THC-induced reductions in paw thickness in both sexes, but did not alter THC-induced anti-allodynia in either sex.

Conclusions: CBD may inhibit THC's antinociceptive effects on chronic inflammatory pain, suggesting that, within the limited dose range tested, combining CBD and THC may not be beneficial for the treatment of inflammatory pain.

Stress

WHEELS OF STRAIN? LIFESTYLE HABITS, STRESS PERCEPTION AND QUALITY OF LIFE AMONG LONG DISTANCE BUS DRIVERS IN NIGERIA

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Epidemiology
Abstract Category: Original Research

Aim: The transport sector is a male-dominated, sedentary, accident-prone occupation with limited opportunities for healthy meals and exercise breaks. We explored relationship between stress perception and Self-reported lifestyles with HRQoL among long distance Bus Drivers in Lagos State.

Methods: 200 randomly enlisted commercial drivers from bus terminals in Lagos State were interviewed face-to-face using a validated structured questionnaire. Combined scores from the 10-item Perceived Stress Scale (PSS) and Lifestyle indicators (tobacco smoking, cannabis use, alcohol consumption, low fruit and vegetable consumption, sleep pattern and prolonged sitting) on HRQOL (SF-12) was assessed by Multivariate regression analysis controlling for covariates including age, marital status, education status, income level and chronic illness.

Results: Prevalence of perceived stress was 62%; 36% were moderate or heavy drinkers (2-4 drinks daily) while 30% were heavy smokers (>11 cigarettes per day); 49% used cannabis of which 20% of them had daily use. The mean scores for physical component and mental component for SF-12 were 45.2 ±7.5 and 49.8 ±8.2. Perceived stress was significantly higher among those with harmful lifestyles: poor diet (OR: 1.42), alcohol consumption (OR: 1.86), heavy smoking (OR: 1.66), daily cannabis use (OR: 1.49) and sedentary lifestyle (OR: 1.45). Perceived stress and Harmful lifestyles were statistically significant predictor for poor quality of life after controlling for socio-demographic and clinical variables (p <0.001).

Conclusions: Since 75% of Nigerians depend on the public buses driven by these hassled drivers, it is imperative that organized strategies are instituted to encourage lifestyle modification and ameliorate the effect of stress on the HRQoL of Bus drivers in Nigeria.

IMPACT OF PRIOR FEAR CONDITIONING ON MORPHINE CONDITIONED PLACE PREFERENCE IN MICE: IMPLICATIONS FOR PTSD-OUD COMORBIDITY

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Abstract Detail: Animal Study
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: Around 40% of the population with an opioid use disorder (OUD) has a co-occurring psychiatric disorder, and among these, posttraumatic stress disorder (PTSD) is the most prevalent. It is well-known that the presence of PTSD and OUD together exacerbate symptoms of each condition, but it remains unclear how underlying neural circuitry associated with trauma and drug cues might overlap. In this project, we utilize two well-known animal models, fear conditioning (FC), and conditioned place preference (CPP), to study the impact of prior aversive learning on associative learning to morphine. We aim to identify behavioral and neurobiological differences between mice conditioned to fear and morphine compared to mice conditioned to morphine without fear.

Methods: C57BL/6J male mice (n=16) underwent auditory cued foot shock (FC) or were exposed to the same conditions without exposure to foot shock ("sham" FC; n=8/group). The next day, all mice began 8 days of morphine CPP acquisition (10 mg/kg, s.c.). Mice then underwent morphine CPP extinction training and were re-tested every 5th day. Change in Difference Scores, defined as time spent in the morphine-paired side of the CPP box minus time on saline-paired side, was determined via paired t-test, and compared between the FC/morphine group and the sham-FC/morphine group to identify behavioral differences.

Results: Both groups acquired CPP, but after 4 days of morphine extinction training, mice with prior FC had significantly extinguished preference for the morphine-paired context (p=0.002). CPP in the sham-FC/morphine mice was not significantly diminished after 4 days (p=0.70), but was significantly decreased after 8 days of extinction (p=0.03).

Conclusions: These data suggest that prior aversive learning in mice may cause dysregulation of learning retention. Our ongoing experiments are investigating the underlying neural mechanisms of this behavioral effect, and may inform our understanding of the neurobiological mechanisms underlying PTSD-OUD comorbidity and improve treatment research on these disorders.

EFFECTS OF BUPRENORPHINE/NALOXONE MAINTENANCE DOSE ON STRESS-REACTIVITY IN OPIOID USE DISORDER

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[1]*Wayne State University*

Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Behavior
Abstract Category: Original Research

Aim: Stressors can increase drug use yet it is unclear whether pharmacotherapies for opioid use disorder (OUD) have stress-protective properties. This study is designed to determine whether buprenorphine/naloxone (B/N) maintenance attenuates pharmacological stress-reactivity, relative to morphine-stabilization baseline.

Methods: This ongoing experimental study uses a double-blind, placebo-controlled, within-subject randomized crossover design (4 medication phases X stressor vs. placebo within-phase). In phase 1, volunteers with OUD are briefly stabilized on extended-release morphine TID (dose titrated to each participant's pre-study opioid use). During 3 subsequent randomized phases (week-1 outpatient, week-2 inpatient), participants are maintained on low, moderate and high daily doses of B/N (1.4/0.36, 4.2/1.08, and 12.8/3.2 mg Zubsolv™, bioequivalent to 2/0.5, 6/1.5, and 18/4.5 mg Suboxone™). During inpatient periods of each phase, stressor (oral yohimbine 60mg + hydrocortisone 40mg) or placebo are administered (1-hr post-B/N) in randomized order on consecutive days. Outcomes are subjective (opioid symptoms, craving, mood state), physiological (vital signs, pupil diameter, saliva and blood biomarkers), and behavioral effects (preferred-opioid and cigarette hypothetical purchase tasks) of the stressor vs. placebo, during morphine and B/N doses.

Results: Hypothesized, moderately-large effects (partial eta-squared values > .15) are reported for the first 8 participants (of 15 planned; to be completed before conference); all participants so far (5M,3F) are primary heroin users. Pharmacological stress- vs. placebo-reactivity is evident from increased systolic/diastolic BP (.86/.70) and pupil diameter (.49) and decreased opioid agonist symptoms (.32). Independent of stress/placebo condition, B/N dose (vs. morphine) is decreasing pupil diameter (.30), opioid withdrawal symptoms (.47), POMS Anxiety (.28), VAS craving for opioids (.60), and opioid demand intensity (.17) and elasticity (.22). Relative to morphine, moderate-dose B/N is attenuating stress-related opioid demand intensity (Phase X Condition, .26).

Conclusions: Independent of stress condition, B/N yields expected dose-related outcomes. Although underpowered at this early analytic stage, B/N presently has modest effects on stress-reactivity.

SI LA RUMBA ESTá BUENA: EXPLORATORY ANALYSES OF ACCULTURATION, SELF-COMPASSION AND SUBSTANCE USE IN SURVIVORS OF INTIMATE PARTNER VIOLENCE IN THE SOUTH BRONX

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Abstract Detail: Human
Drug Category: Polydrug (i.e. Use of more than one drug combination)
Topic: Ethnic Differences
Abstract Category: Original Research
Aim: Intimate partner violence (IPV) is associated with increased onset of psychiatric disorders, including substance use disorder (SUD). A previous chart review (N=203) of IPV survivors receiving psychiatric services at an IPV advocacy center found lower than expected rates of SUD—10.24% (Weiss et al, 2017)—compared to reported SUD prevalence in US IPV survivors of 18-72% (Rivera et al, 2015). Further research is needed to explain this finding, which may be due to characteristics of the sample: 69% were born outside of the mainland US and are acculturating. Acculturation to the US has been shown to reduce wellbeing (i.e. Alarcón et al, 2016), including increasing risk for SUD, attributed to the lower collectivistic social support in the US (Caetano et al, 2000). This study assesses whether higher levels of internalized social support, operationalized as the belonging subscale of the self-compassion scale (SCS), have buffered these traumatized individuals against SUD.

Methods: A pilot sample (n=30) of IPV survivors receiving advocacy services completed the Short Acculturation Form for Hispanics (SASH), the SCS and the criteria for SUD on the MINI.

Results: Data collection is ongoing, but preliminary results contradict our hypothesis that the SCS's belonging subscale mediates the relationship between acculturation and substance abuse. However, a moderation analysis using Jamovi showed that belonging moderated this relationship. The outcome variable for this analysis was substance use disorder. The predictor variable was acculturation. The interaction between substance use disorder and acculturation was found to be significant [ß= -0.28, 95% C.I. (-0.50, -0.05) p <.02]. The conditional effect of acculturation on SUD showed corresponding results. At low moderation, the unstandardized simple slope for participants 1 SD below the mean level of belonging was -0.53, 95% CI (-0.81, -0.25) p<.001], at middle moderation, the unstandardized simple slope for participants with a mean level of belonging was -0.28, 95% CI (-0.50, -0.05), p=.02], and at high moderation, the unstandardized simple slope for participants with 1 SD above the mean of belonging was -0.02, 95% CI (-0.30, 0.25). These results identify belonging as a negative moderator of the association between acculturation and SUD.

Conclusions: This finding supports our hypothesis that less acculturation would allow an internalized sense of belonging, a protective effect of collectivism, to reduce distress and thus maladaptive coping such as substance abuse.

THE OPIOID RISK TOOK PREDICTS POST-TRAUMATIC STRESS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Treatment
Abstract Category: Original Research

Aim: Although prescription opioids are an effective pain treatment strategy, long-term use can lead to opioid misuse and addiction. Determining which patients are at risk for opioid misuse during hospitalization can be used to develop prevention interventions post-discharge. Using the Opioid Risk Tool (ORT) as a hospital screening measure, the aim of this study was to predict post-discharge pain severity, stress, and need for additional pain management.

Methods: One hundred and four injured patients at a level I trauma center in Houston, Texas completed a revised version of the ORT in the hospital, and a web-based survey at two weeks post-discharge. The survey assessed pain level, prescription medication use, injury-related stress, and need for additional pain treatment services. Regressions and t-tests were used, where appropriate, to determine the predictive value of the ORT.

Results: The ORT identified 15.5% of patients at high-risk for opioid-related aberrant behavior. Post-discharge survey results indicated high percentages of patients reporting moderate to severe pain (79.6%), pain interference (77.9%), taking pain pills (59.6%), experiencing stress (76.9%), and needing pain treatment (52.4%). The ORT predicted injury-related stress, [$t(101) = -2.467$, $p = 0.015$] but did not predict opioid use.

Conclusions: Risk of opioid misuse assessed in hospitalized trauma patients had a direct relationship with level of injury-related stress reported during the acute post hospitalization period. This finding highlights the importance of including assessment of stress in follow-up

appointments, as those at high-risk might be more likely to misuse opioids in the future to relieve this stress.

IMPULSIVITY IN INDIVIDUALS WITH A HISTORY OF OPIOID USE WITH AND WITHOUT POST-TRAUMATIC STRESS DISORDER VERSUS HEALTHY CONTROLS

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Abstract Detail: Human
Drug Category: Opiates/Opioids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: A substantial body of literature suggests that impulsivity is a core feature of opioid-use disorders and is critical to understanding substance use initiation, maintenance, and relapse. In addition, impulsivity is a key feature of multiple other psychiatric disorders, including posttraumatic stress disorder (PTSD). Research suggests that the relationship between disorders and impulsivity is additive, such that individuals with multiple disorders exhibit greater impulsivity than individuals with a single disorder. However, few studies have examined impulsivity in individuals with opioid use and PTSD.
Methods: We compared 59 individuals with a history of opioid use (OU) who met criteria for PSTD, 30 OUs without PTSD, and 30 control participants on the Short Urgency, Premeditation, Perseverance, Sensation Seeking, Positive Urgency Impulsive Behavior Scale (SUPPS-P) and the Monetary Choice Questionnaire (MCQ) to examine the relationship between impulsivity, opioid use, and PTSD.
Results: The three groups differed significantly on the SUPPS-P negative and positive urgency ($F_{(2, 119)} = 49.72$, $p<.001$; $F_{(2, 119)} = 29.49$, $p<.001$) and lack of premeditation ($F_{(2, 119)} = 18.68$, $p<.001$) subscales, with OUs with PTSD exhibiting greater scores on each subscale than both OUs without PTSD and healthy controls. Similarly, the three groups differed significantly on the MCQ ($F_{(2, 117)} = 13.93$, $p<.001$). Although OUs with PTSD exhibited greater discounting than controls, no significant differences were observed between the two OU groups.
Conclusions: This study demonstrates that OUs with PTSD may respond more impulsively than OUs without PTSD and controls in response to intense emotions. Furthermore, OUs with PTSD discount delayed rewards at a greater rate compared to control participants. These findings highlight the need for PTSD treatment in OUs. Future studies should examine whether PTSD treatment is associated with reductions in impulsivity, discounting, and opioid use relapse.

LEVER-PRESS DURATION AS A MODEL OF FRUSTRATION IN INTRAVENOUS SELF-ADMINISTRATION

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Abstract Detail: Animal Study
Drug Category: Other, Stimulants & Opiates
Topic: Behavior

Abstract Category: Original Research

Aim: Previous research has shown that the omission of reinforcement after exposure to consistent reinforcement creates a state of frustration. The frustrated expectation of a reinforcement produces perseverative operant responding leading to extinction. Traditionally, number of lever presses has been used as a measure of frustration; however, we propose bar-press duration as an additional measure with properties distinct from number of presses.

Methods: To address this, rats were trained to self-administer fentanyl (0.0032 mg/kg/inf) or cocaine (0.5 mg/kg/inf). We then measured number of presses and durations during acquisition, maintenance, extinction, reacquisition, and progressive ratio. We found that rats emitted long bar presses at any time blood levels were below desired levels: loading phase of the session, increases in the fixed ratio requirement, extinction, and immediately prior to terminating responding in progressive ratio.

Results: Unlike number of bar presses, duration of presses is not sensitive to dose, meaning that this measure can be used during maintenance responding. Interestingly, by our conceptualization, rats escalating intake emit long bar presses, suggesting frustration even during elevated drug intake. These results are consistent with our hypothesis that rats demonstrating low frustration tolerance are more susceptible to escalation of drug taking. Additionally, preliminary data suggest durations are not sensitive to hunger motivation.

Conclusions: In conclusion, bar press durations provide information regarding frustration distinct from number of bar presses.

ASSOCIATIONS BETWEEN TRAUMATIC EXPERIENCES AND SUBSTANCE USE DISORDERS: FINDINGS FROM THE WORLD HEALTH ORGANIZATION'S WORLD MENTAL HEALTH SURVEYS

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Abstract Detail: Human
Drug Category: Other, General
Topic: Epidemiology
Abstract Category: Original Research

Aim: Exposure to traumatic events (TEs) is known to be associated with substance use disorders (SUDs). However, most studies focus on a single trauma type, without considering exposure to and accumulation of other TEs. In addition, data are often limited to high-income countries. This study uses cross-national data to examine the associations of diverse TEs with subsequent first onset of a SUD.

Methods: Data come from the World Health Organisation's World Mental Health Survey Initiative. A total of 67,225 respondents across 23 countries were assessed for exposure to six categories of TEs as well as lifetime SUDs. Discrete-time survival analyses were used to examine temporal associations of TE categories with subsequent first onset of SUD controlling for socio-demographics and comorbid mental disorders.

Results: Majority (70.9% [SE, 0.3%]) of respondents reported having experienced at least one TE, with the most commonly reported TE category being network TEs (38.6% [SE, 0.3%]) and the least common exposure to organised violence (9.5% [SE, 0.2%]). Most TE categories were associated with increased odds of a subsequent first onset of a SUD. Exposure to interpersonal

violence or sexual-relationship violence was associated with an increased odds of subsequent SUD onset in all life stages, with the association remaining long after first exposure. The associations between exposure to other life-threatening TEs, network TEs, or participation in organised violence with SUD onset were strongest in the 6-17 person-year interval, with the effect of the latter two TE categories decreasing and eventually disappearing with time since first exposure. No evidence for an association between exposure to organised violence and first onset of a SUD was observed.

Conclusions: This study highlights the potential for specific TE exposures as risk factors for SUDs and suggest that targeted treatment may address both the consequences of TE and SUDs.

RESPONSES TO SOCIAL EVALUATIVE STRESS IN REGULAR CANNABIS SMOKERS

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Abstract Detail: Human
Drug Category: Marijuana/Cannabinoids
Topic: Substance Use Disorder
Abstract Category: Original Research
Aim: Aspects of physiological and psychological stress responding differs in stimulant, opioid, and alcohol users relative to controls, and dysregulated responses to stress may contribute to the maintenance of problematic substance use. Little is known about stress responses in adult cannabis smokers. Here, we assessed social stress responding in regular cannabis smokers relative to matched controls.

Methods: Nineteen healthy, non-treatment seeking adult cannabis smokers (≥4x weekly cannabis use; smoking cannabis as usual) and twenty controls completed the Trier Social Stress Task (TSST), a standardized laboratory social stress assay during the early afternoon. Subjective mood, heart rate, and salivary cortisol were assessed at baseline and repeatedly after the TSST. Data were compared with mixed between/within-group ANOVAs.

Results: Cannabis smokers (28.8±5.3 years old, 1 female; cannabis use 6.4±1.1 days/week) and controls (29.3±4.8, 2 females) were matched on trauma exposure, sex, race, and age. As expected, the TSST increased indicators of stress across the sample, increasing negative affective states, salivary cortisol, and heart rate ($p<0.05$). Cannabis smokers exhibited blunted subjective stress responses relative to controls, who rated themselves as significantly more nervous, anxious, and depressed after the TSST than did cannabis smokers ($p<0.05$). There were no differences in physiological (cortisol and cardiovascular) markers of stress as a function of cannabis smoking.

Conclusions: These data suggest that cannabis smokers have blunted mood responses to acute social stress, with normative physiological stress responding. Observed differences could be due to residual effects of cannabis, reluctance to endorse negative mood states, or to issues experiencing or identifying stress-related affective states. Further research is warranted to characterize the mechanisms of these differences and assess implications for daily function and treatment outcomes.

THE IMPACT OF SUBSTANCE USE ON STRESS RESPONSE FUNCTIONING AND SYSTEMIC INFLAMMATION IN A SAMPLE OF WOMEN AT RISK FOR HIV

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Abstract Detail: Human
Drug Category: Other, Alcohol, Illegal Drugs, Marijuana
Topic: HIV/Immune
Abstract Category: Original Research

Aim: Substance use impacts stress response functioning and promotes systemic inflammation due to potential dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis. However, little is known about the relationship between alcohol and drug use and cortisol, a biomarker of HPA axis dysregulation, and C-reactive protein (CRP) an indicator of systemic inflammation. The present analyses aim to understand the dynamics of this relationship among adolescent and adult women.

Methods: The THRIVE Study is a prospective case-control study of women aged 14-45 experiencing recent sexual trauma (cases) or consensual vaginal intercourse (controls). At a baseline visit, survey data is collected, including substance use (NIDA ASSIST, AUDIT-C), followed by collection of biological samples. Descriptive statistics among control participants (n=42) were used to understand the relationships between alcohol use (non-hazardous/hazardous) and drug use (low/moderate/high risk), cortisol awakening response (CAR) calculated as mean difference in cortisol upon awakening and 30 minutes post-waking, across three consecutive days, and CRP (mg/dL).

Results: Most participants endorsed hazardous drinking behaviors (57.1%) and moderate-risk (38.1%) or high-risk (14.3%) drug use. Average CRP among participants was 2.1 mg/dL (standard deviation ±2.5), and average cortisol was 0.27 µL/dL (standard deviation ±0.5). Those who endorsed hazardous drinking behaviors had higher average CRP (2.3 vs. 1.8 mg/dL) and lower average CAR (0.2 vs. 0.4 µL/dL), although non-significant (p= 0.593, p=0.342) Those who endorsed high risk drug use had non-significantly higher CRP than those who endorsed low or moderate risk drug use (3.2 vs. 1.9 mg/dL; p=0.500), and lower CAR (0.2 vs. 0.3 µL/dL, p=0.646).

Conclusions: Our findings suggest that substance use alters stress response activity and inflammation although the small sample size limited power to detect significant associations. Increased understanding of this relationship will allow for clinical reactivity to adolescent and adult women with substance use disorders, with particular consideration for complications stemming from chronic inflammation and immunocompromisation.

QUANTITATIVE META-ANALYSIS OF HEART RATE VARIABILITY FINDS REDUCED PARASYMPATHETIC CARDIAC TONE IN WOMEN DURING LABORATORY-BASED SOCIAL STRESS

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Abstract Detail: Human
Drug Category: Other, Substance Use Disorder-General

Topic: Sex Differences

Abstract Category: Original Research

Aim: Heart rate variability (HRV) is the inter-beat interval variation between consecutive heartbeats and an autonomic reflection of emotional regulation abilities to flexibly respond to challenges, such as psychosocial stress. Whereas there is an association between HRV and substance use disorder, we identified a gap in our basic understanding of sex-specific autonomic cardiac control during stress.

Methods: Thus, we performed a literature search using the following string: (("Heart Rate Variability" OR "HRV") AND ("Trier Social Stress Test" OR "TSST") AND ("Public Speech" OR "Social Evaluative" OR "Psychosocial Stress") AND (DOCUMENT TYPE: (Article)). We assessed HRV prior to, during and after administration of a public speech task in healthy participants (n=929) according to sex.

Results: Our meta-analysis found that during stress women had lower HRV than men, with an overall Hedges' g of 0.29 (p<0.0001) and 0.29 (p=0.0003) for fixed and random effects models, respectively. We did not find significant heterogeneity or evidence of publication bias. Analyses of additional timepoints showed no baseline difference and marginally lower HRV in women during anticipation and recovery.

Conclusions: Findings of the present meta-analysis confirm sex differences in stress-induced hyperarousal and form a justification for future research evaluating HRV as a marker of stress in women with SUD.

TRANSDIAGNOSTIC CORRELATES OF CO-OCCURRING PROBABLE PTSD AND SUBSTANCE USE DISORDER AMONG LOW-INCOME, ACUTE-CARE PSYCHIATRIC INPATIENTS

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Abstract Detail: Human

Drug Category: Polydrug (i.e. Use of more than one drug combination)

Topic: Substance Use Disorder

Abstract Category: Original Research

Aim: Psychiatric inpatients report high rates of potentially traumatic life events and posttraumatic stress disorder (PTSD). Psychiatric inpatients are also at greater risk of substance use and substance use disorder (SUD). Transdiagnostic factors (i.e., mechanisms that predict and/or maintain symptoms across various psychological disorders) with clinical relevance to both PTSD and SUD have the potential to improve evidence-based interventions. The current study sought to examine specific transdiagnostic factors among a sample of psychiatric inpatients with probable PTSD and SUD.

Methods: Participants were comprised of 69 adult acute-care psychiatric inpatients (37% male; Mage=34.15, SD=11.39) with either co-occurring probable PTSD and SUD (PTSD/SUD; n=22), probable PTSD-only (n=24), or SUD-only (n=23). All participants completed a self-report questionnaire battery and urine drug screening (UDS) at admission. Participants with SUD diagnoses also screened positive for at least one substance via UDS. Levels of anxiety sensitivity (AS; fear of anxiety-related sensations), distress tolerance (DT; perceived ability to withstand negative emotions), emotional dysregulation (ED; difficulties in modulating emotions), and mindfulness (present-centered awareness and acceptance) were examined across diagnostic subgroups. One-way analyses of covariance were conducted to evaluate statistically significant differences between subgroups. Covariates included the number of

traumatic event types endorsed and suicidal ideation/behavior as a precipitant to hospitalization.

Results: Consistent with hypotheses, participants with probable PTSD/SUD reported higher levels of AS and ED and lower levels of mindfulness compared to other subgroups. Levels of AS and ED were significantly greater and mindfulness significantly lower among the probable PTSD/SUD and probable PTSD-only subgroups. Levels of DT were significantly lower among the probable PTSD-only compared to other subgroups.

Conclusions: Findings suggest the potential clinical utility of targeting these transdiagnostic factors, via specialized interventions stand-alone or adjunctive treatments in the acute-care psychiatric inpatient setting, to help inform care and improve treatment outcomes.