Paper Session A1: Cannabis Use and Endocannabinoid System Alterations in Individuals with History of Trauma and PTSD

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Summary: There is a high rate of cannabis use in individuals with history of trauma and PTSD. In addition, animal and human studies consistently reported endocannabinoid system alterations associated with history of prolonged stress and trauma, but results are contradictory on the nature of these changes. We propose that childhood and adulthood trauma affect the endocannabinoid system in different ways, which has clinical implications for individuals with history of trauma and PTSD who use cannabis for recreational or medicinal purposes as well as implications in research studies of the potential therapeutic effects of cannabinoids in PTSD treatment.

Background: Many cannabis users report using cannabis to cope with stress and there is a high rate of cannabis use in individuals with history of trauma and PTSD. In fact, PTSD is the one of the main psychiatric indications of medical marijuana. Furthermore, increasing animal and human studies consistently report persistent endocannabinoid alterations in individuals with history of severe trauma and prolonged stress. However, there is no consensus on the direction of these changes. Given the increasing rate of legalization of cannabis for recreational and medicinal use, higher rates of cannabis use in individuals with history of trauma, and ongoing research studies on the potential therapeutic uses of cannabinoids in PTSD treatment, there is an urgent need to understand the nature of the endocannabinoid system alterations in individuals with history of trauma and PTSD. We review the current animal and human evidence in this paper and propose that developmental and accumulative effects of trauma would partly explain these differences. We also present the pilot data on the effects of childhood trauma on the cannabinoid receptor type 1 (CB1R) in PTSD.

Methods: We reviewed animal and human studies on the effects of prolonged stress and trauma on the endocannabinoid system. We also conducted a pilot study of cannabinoid receptor type 1 (CB1R) availability using PET imaging and OMAR ligand in individuals with PTSD compared to healthy individuals (sample size=18). Furthermore, we investigated the effects of childhood trauma on the CB1R availability in individuals with PTSD in different brain regions. PTSD was evaluated using PTSD CheckList (PCL) and childhood trauma was measured by Childhood Trauma Questionnaire (CTQ) or The Early Trauma Inventory Self Report-Short Form (ETISRSF).

Results: The current available animal and human studies suggest that childhood trauma results in decreased and adulthood trauma results in increased presentations of cannabinoid receptor type 1 (CB1R). The results of our pilot study demonstrated that CB1R availability is lower in individuals with PTSD and positive history of childhood trauma compared to those with PTSD without history of childhood trauma, in all brain regions. This is consistent with the proposed theory that childhood trauma induces decreased presentations of CB1R.

Conclusions: Our pilot study, consistent with available animal and human studies, found decreased availability of CB1R in individuals with history of childhood trauma and PTSD. To the best of our

knowledge, this is the first study reporting this, which has important clinical implications in recreational and medicinal cannabis users with PTSD and history of childhood trauma. In research studies investigating the potential therapeutic uses of cannabinoids in PTSD treatment or medical marijuana, it is important to consider age of first trauma. Decreased presentations of CB1R in PTSD with history of childhood trauma, vs. its increased presentations in PTSD with adulthood trauma suggest opposing effects of cannabinoids in these two groups, which needs further investigations.

Educational Objectives: At the conclusion of this activity, learners should be able to:

1. Determine the high rates of cannabis use in individuals with history of trauma and PTSD, both for recreational and medicinal reasons
2. Discuss the ongoing studies on the potential uses of cannabinoids in PTSD treatment.
3. Recognize that the effects of trauma on endocannabinoid system may explain the high rate of cannabis use in PTSD.
4. Recognize that childhood vs. adulthood trauma may affect the endocannabinoid system in different manners.

Funding Sources: NIH grant #I01 CX001538

Paper Session A2: Treating Depression Has a Net Positive Effect on Smoking Cessation Treatment Outcomes

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Summary: We present data from our program showing that treating depression produces a positive impact in the context of trying to quit smoking. These data have important implications on addiction psychiatrists' practice and psychiatrists provide smoking cessation treatment to their patients.

Background: Around 500,000 people die annually in this country alone from smoking related illnesses. Smoking prevalence is 3 times higher among those with mental illness and 4 to 5 times high among those with substance use disorders. Psychiatrists, including those specialized in addiction, have not paid attention to the scourge of tobacco use disorder, and frequently believe that treating smoking cessation exacerbates depression. Our data show that both disorders are treatable and treating them sequentially or simultaneously produces positive results in both.

Methods: We conducted a case-control study with data collected routinely in the tobacco treatment program at a large cancer hospital. Some of the patients with depressive symptoms agreed to and were evaluated by the program psychiatrist after their tobacco cessation treatment consultation and were followed by the same psychiatrist during their treatment for tobacco cessation. Self-reports of patients' abstinence were obtained independently by program staff calls at 3, 6, and 9 months.

Results: A cohort of 6361 patients were treated in the program from 2006 to 2016. Of those, 557 saw the program psychiatrist for different disorders, 245 of whom had a diagnosis of a major depressive disorder. We divided patients into 3 groups according to Center for Epidemiologic Studies-Depression (CES-D) score. The first group had CES-D score of less than 24 (N=5255).The second group had CESD score equal to or greater than 24 but did not receive treatment for depression. They were either not interested in or did not present to their appointment to meet with the program psychiatrist (N=861). The third group had CESD equal to or greater than 24 and received treatment for depression the program psychiatrist (N=245). Preliminary analyses showed that depressed patients had lower abstinence rates in general compared to non-depressed patients at EOT, 6 months, and 9 months. However, depressed patients who were treated for depression had higher abstinence rates than did those who were not treated for depression at 9 months (p-value = 0.035)

Conclusions: Smokers diagnosed with major depressive disorder are less likely to succeed in their attempt to abstain from smoking. The treatment of depressive symptoms play an important role in mitigating the effects of depression and in improving tobacco treatment outcomes.

Educational Objectives: At the conclusion of this activity, learners should be able to:

1. Describe the high co-occurrence of depression and smoking.
2. Recognize the negative impact of depression on ability to quit smoking.

3. Determine that treating depression can improve the chances to quit smoking.
4.

Funding Sources: State of Texas Tobacco Settlement funds awarded to the University of Texas MD Anderson Cancer Center and by MD Anderson's Cancer Center Support Grant CA016672.

Paper Session A3: Addiction Treatment in Transplant Patients

Walter Luchsinger, MD, *Yale University*; *Paula* **Zimbrean, MD, FAPA, FACLP**, *Yale New Haven Hospital; Associate*

Summary: To the best of our knowledge, this is the first systematic review on the treatment of addiction in transplant patients.

Background: The number of patients with substance use disorder in need for organ transplantation is expected to increase. More than 6,500 people died in 2017 while on organ transplant waitlist and for people with alcohol, opioid or other illicit drug abuse the ability to get an organ is even more difficult. The main problem with substance abuse appears to be especially important in transplant due to risk of noncompliance after surgery and therefore graft loss. Nevertheless, organ transplantation has been increasingly used as a treatment for end stage organ failure secondary to substance abuse and favorable outcomes are possible. The main goal of this systematic review was to assess the current literature on addiction treatments in transplant patients.

Methods: A systemic review was conducted using 4 databases, PubMed, MEDLINE, EMBASE and PsycINFO for publications dated 1/1/1988 to 12/31/2017. We used the following key words: "transplant" in combination with the following: "substance abuse treatment," "substance dependence treatment" "addiction treatment," "methadone," "buprenorphine," "naltrexone," "disulfiram," "acamprosate," "baclofen," "nicotine," "gabapentin," "topiramate," “Varecicline," “nicotine replacement,” "zonisamide," "Odansetron," "nalmefene," "12 steps," "self-help," "contingency management," "cue exposure treatment," "relapse prevention treatment", "SBIRT (Screening, brief intervention and referral fro treatment". Also "transplant" in combination with "treatment" and each of the following: "alcohol," "cocaine, " "opioids," "nicotine", "hallucinogens", "sedative", "steroid", "cannabis" "cannabinoids". The project was registered with PROSPERO (registration number CRD42015020379) on the PROSPERO register.

Results: Out of 3,108 articles identified for full review, 15 were included for the final analysis and summarized in a table to describe the impact of substance abuse treatment in transplant patients. All of the articles included were for liver transplant, 9 for alcohol use disorder, 6 for opioid use disorder and 3 out of the 15 were case series. Promising treatment options were found from the literature review for alcohol use disorder in transplant patients including posttransplant multidisciplinary support to alcohol misuse (MSAM), text messaging and having an alcohol addiction unit (AAU) within the transplant center. In addition, Methadone showed to be effective and safe in transplant.

Conclusions: There are promising options, especially for alcohol use disorder, but more studies are needed to confirm the effectiveness of these treatment options since most could be difficult to implement. Methadone appears to be as effective in transplant patient as in the general population and therefore patients on methadone maintenance treatment should be considered for transplantation listing. Buprenorphine was found to be effective in a case series, but more evidence is needed. A more recent finding is that addiction treatment posttransplant was reported to be as important or more important than pretransplant.

Educational Objectives: At the conclusion of this activity, learners should be able to:

1. List different treatment options for alcohol use disorder in transplant patients.
2. Recognize the importance of treating substance use disorder pre and post-transplant.
3. Utilize methadone as an effective treatment of opioid use disorder in transplant patients

Funding Sources: None

Paper Session A4: Substance Use Coercion: A Critical Issue for Addiction Psychiatrists

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Summary: This paper presents findings from a survey conducted with callers to the National Domestic Violence Hotline asking about their experiences with substance use coercion - abuse specifically targeted towards a partner's use of substances. Results showed that experiencing these two types of coercion were common among hotline callers: 89% had experienced at least one of the three types of mental health coercion asked about, and 43% had experienced at least one of the three types of substance use coercion. Most of the survivors who reported any type, reported more than one. In addition, most survivors who reported their abusive partners had actively contributed to their use of substances also said their partners threatened to use their difficulties or substance use against them with important authorities, such as legal or child custody professionals, to prevent them from obtaining custody or other things that they wanted or needed. Detailed analysis of results also shows that the more types of coercion survivors experienced, the more likely they were to seek help. The paper will discuss the prevalence and impact of substance use coercion and the implications for addiction psychiatrists and will provide guidance for integrating questions and brief interventions into clinical practice and substance use policy.

Background: Research has consistently documented that abuse by an intimate partner increases a person's risk for developing a range of mental health conditions including depression, PTSD, suicidality, chronic pain and substance use. Some are the direct result of interpersonal violence; others are related to the traumatic effects of ongoing abuse. Research has also documented high rates of DV among people seen in substance use disorder treatment settings, underscoring the need for more integrated approaches. Less well recognized are the ways that people who abuse their partners engage in coercive tactics targeted toward a partner's substance use as part of a broader pattern of control - tactics referred to as substance use coercion. While DV survivors may use substances to cope with emotional trauma or chronic pain, they may also be coerced into using by an abusive partner who controls their supply and then uses that to further their control. A survey conducted by the National Domestic Violence Hotline found disturbingly high rates of abuse specifically targeting women's use of substances. Although survivors have reported these tactics for decades, these surveys provided the first large scale, quantitative data on the issue, including that abusive partners intentionally undermine their partners' sanity or sobriety; control their medication; interfere with their treatment, sabotage their recovery; and discredit them with friends, family, helping professionals, and in the courts. Data from the survey will be discussed along with guidance on responding to substance use coercion in clinical practice as well as broader policy implications.

Methods: The substance use coercion survey was conducted with callers to the National Domestic Violence Hotline. It asked briefly about callers' experiences with different forms of substance use coercion used by their abusive partners. Respondents were adult women who had experienced domestic violence (DV), were not in immediate crisis, had completed the service portion of their hotline call, agreed to participate after hotline staff explained the survey's topics, and were assured that survey

participation was voluntary and anonymous. The survey was conducted by hotline staff over a period of six weeks and involved over 3,000 participants. Analyses consisted of frequencies, cross-tabs and simple correlations to provide an understanding of survivors' experiences.

Results: 26.0% reported using alcohol or other drugs as a way to reduce the pain of their partner or ex-partner's abuse. 27.0% said that a partner or ex-partner had pressured or forced them to use alcohol or other drugs, or made them more than they wanted. 15.2% reported that, in the last few years, they tried to get help for their use of alcohol or other drugs; of those, 60.1% said that a partner or ex-partner had tried to prevent or discourage them from getting that help. 37.5% said that a partner or ex-partner had threatened to report their alcohol or other drug use to someone in authority to keep them from getting something they wanted or needed (e.g. custody of children, a job, benefits, or a protective order). 24.4% reported being afraid to call the police for help because their partner said they wouldn't believe them because they were using, or that they would be arrested for being under the influence of alcohol or other drugs.

Conclusions: These issues highlight the importance of ensuring that addiction psychiatrists are trained to recognize and respond to the ways that trauma and DV can impact survivors' use of substances, their access to services, and their relapse and recovery, and to implement policies and practices that support attention to these issues. Providers can talk with people about substance use coercion as part of their routine behavioral health histories and/or during assessment for DV. Including questions about the connection between a person's relationship with their partner and their mental health and use of substances creates an opportunity for someone experiencing DV to think about how these issues might be connected for them and to develop strategies to navigate more safely. It also allows clinicians and recovery support providers to offer more appropriately tailored counseling, treatment, and/or referral. From a policy perspective, it is also critical that federal, state, and local agencies responding to the opioid epidemic incorporate strategies that specifically address the interplay between DV, coercion, trauma, and substance use. Incorporating information about both DV and about substance use coercion into training programs for substance use disorder treatment and peer recovery support providers, introducing evidence supporting the effectiveness of harm reduction programs but with attention to DV, and developing trauma-informed, culture and gender-responsive policies and practice standards are key priorities. Strengthening collaboration between substance use treatment providers and DV programs at the state and local level can also play a critical role in moving toward more effective intervention and prevention.

Citations:

[1] Warshaw C., Lyon E., Bland P., Phillips, H. & Hooper M. (2014). Mental Health and Substance Use Coercion Survey: Report on Findings from the National Center on Domestic Violence, Trauma & Mental Health and the National Domestic Violence Hotline. Chicago, IL: National Center on Domestic Violence, Trauma & Mental Health. 2104.

[2]Warshaw C., Tinnon E., Coercion Related to Mental Health and Substance Use in the Context of Intimate Partner Violence: A Toolkit for Screening, Assessment, and Brief Counseling in Primary Care and Behavioral Health Settings. National Center on Domestic Violence, Trauma & Mental Health. Chicago, IL. 2018.

Educational Objectives: At the conclusion of this activity, learners should be able to:

1. Describe the concept of substance use coercion.

2. Describe the prevalence of these tactics among hotline callers and the implications for clinical practice.
3. Apply screening, assessment and counseling for substance use coercion into substance use disorder treatment and recovery support services

Funding Source: Grant # 90EV0437-01-00 from the Administration on Children, Youth and Families, Family and Youth Services Bureau, U.S. Department of Health and Human U.S. Department of Health and Human Services. Services

Paper Session B1: The Effect of Buprenorphine Maintenance Therapy on Substance Use in Patients with Opioid Use Disorder: Systematic Review and Meta-Analysis

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Summary: North America continues to experience a crisis of opioid use disorder (OUD) leading to increasing numbers of patients enrolled in treatment with medication assisted therapy (MAT). In some jurisdictions, buprenorphine is now recommended as first-line treatment. The objective of this study was to determine the effects of maintenance treatment with buprenorphine compared to methadone or placebo on opioid and non-opioid substance use in individuals with OUD.

Background: In jurisdictions where MAT primarily takes on a harm-reduction role such that retention in treatment is not contingent on abstinence from opioid or other drug use, concerns about the risks of polysubstance use during treatment are heightened. Although OST, pharmacologically, is not directly intended to reduce substance use apart from opioids, clinical questions arise as to whether patients receiving OST experience concurrent reduction in their non-opioid substance use. Whether various opioid agonists differ in this outcome is also a question of clinical importance.

Methods: We searched Medline, EMBASE, CENTRAL, PsycINFO, Web of Science Conference Proceedings Index, Biosis, trial registers, and reference lists of relevant articles (all from date of inception up to February 2019). All randomized controlled trials comparing buprenorphine maintenance to methadone maintenance or placebo were eligible for inclusion. Two reviewers independently screened studies for eligibility and pairs of reviewers extracted data and assessed risk of bias. Data were summarized using narrative synthesis or meta-analysis using random effects models as appropriate. (PROSPERO ID: 128986). Two reviewers independently used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) criteria to assess the certainty of evidence related to each of the key outcomes

Results: Altogether, 68 papers from 38 studies involving 6,304 patients were included in our review. Many studies excluded participants with comorbid substance use disorders (n = 25). Many studies could not be included in meta-analyses due to the nature of their reporting of urine screen results. There is moderate quality evidence when pooling 6 studies (1,147 participants) that reveals no important difference between buprenorphine and methadone treatment in cocaine use, as measured by urine screens (SMD = 0.06, 95% CI -0.16 to 0.28). Narrative synthesis of urine results for benzodiazepines, amphetamines, and cannabis also suggests little to no difference in the effect of these treatments.

Conclusions: Our findings indicate that there is no important difference between buprenorphine and methadone with respect to their effects on non-opioid substance use based on very low to moderate quality evidence. This review identifies several gaps in the literature: 1) the need for more trials that

include patients with polysubstance use, 2) improved reporting of urine drug screen results to permit meta-analysis, and 3) increased reporting on non-opioid substance use outcomes.

Educational Objectives: At the conclusion of this activity, learners should be able to:

1. Discuss the pooled effects of buprenorphine, methadone, and placebo on opioid and non-opioid substance use, respectively.
2. Determine the limitations present in the current MAT literature with regards to exclusion criteria and outcome reporting.
3. Identify the need for future studies that address some of these limitations.

Funding Sources: None

Paper Session B2: Patient-important Outcomes in Opioid Substitution Therapy: How do patients' goals align with abstinence from illicit opioid use?

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Summary: In the wake of the opioid crisis across North America, many individuals are receiving medication-assisted treatment (MAT) for opioid use disorder (OUD). The objective of this study is to understand patient-identified important treatment outcomes and to assess the extent to which these are associated with patients' abstinence from illicit opioid use.

Background: Identifying core treatment outcomes for MAT is an ongoing area of investigation, and there currently exists variability in the outcomes considered important for evaluating the effectiveness of treatment. Patients are frequently excluded from the process of identifying important treatment outcomes. How patients' goals in treatment align with their outcomes, as measured by current provider-valued outcomes is unknown. This prospective cohort study examines patient-identified important outcomes using a mixed methods model.

Methods: We prospectively collected data from 2,028 individuals enrolled in outpatient MAT for OUD in Ontario, Canada. Patients are followed for 12 months to assess illicit opioid use as measured by urine drug screens. At study entry, all participants were asked the open-ended question: "What are your goals in treatment?". We used NVivo software for qualitative analysis to identify common themes from patient responses. Using unadjusted analyses, we described patient-important outcomes in relation to demographic and clinical characteristics. We used linear regression to examine the association between patient-reported important outcomes and percentage of opioid-positive drug screens and multinomial logistic regression to examine associations with the level of opioid-positive urine drug screens (abstinent, <50% of urine screens positive for opioids, and >50% of urine screens positive for opioids). The models were adjusted for important covariates including age, sex, medication dose, and length of time in treatment.

Results: The mean age of participants was 39 years (SD=10.7), and 56% were male. Most were receiving treatment with methadone (79%) with a mean dose of 70 mg daily (SD=41.4) and were in treatment for a median duration of 30 months (IQR=62 months). The most commonly reported patient-important outcome was to "stop treatment", reported by 57% of participants, followed by "to stay clean" (37%), to achieve "pain management" (12%), "to live a stable or normal life" (14%), "to avoid withdrawal/control cravings" (12%), and "to maintain or stabilize medication dose" (6%). During up to 6 months of follow up, the mean percentage of opioid-positive drug screens was 14.7% (SD = 21.1) and 28% of participants were abstinent from opioid use (zero positive screens), while 63% had up to 50% of urine screens positive for opioids, and 9% had more than 50% positive screens. Lower percentage of opioid-positive drug screens was associated with higher medication dose (B=-0.04, 95% CI -0.07, -0.01, p=0.002), treatment with buprenorphine (B=-9.67, 95% CI -12.3, -7.0, p<0.001), and longer duration in treatment (B=-0.54, 95% CI -0.73, -0.34, p<0.001)). Higher percentage of opioid-positive drug screens was associated with the goal to "stay clean" (B=4.2, 95% CI 2.25, 6.07, p<0.001) and "avoid withdrawal/control cravings" (B=3.3, 95% CI 0.58, 6.11, p=0.018). Similarly, the goal of "staying clean" was associated with increased risk of having >50% opioid-positive drug screens (RRR=1.7, p=0.002) when compared to abstinence. The goal of "living a stable or normal life" showed a trend towards association

with increased risk of having >50% opioid-positive drug screens (RRR=1.5, *p*=0.069) compared to abstinence.

Conclusions: Patient-important outcomes may differ from outcomes currently valued by MAT clinical trials and MAT providers/programs. We identify several other patient-important outcomes that are important to consider and measure when working with patients to achieve treatment goals.

Educational Objectives: At the conclusion of this activity, learners should be able to:

1. Recognize outcomes of MAT that are identified as important by patients.
2. Consider patient demographics in relation to valued outcomes (patient-centered care approach).
3. Reflect on the association between a patient's self-identified important outcomes, and their outcomes in treatment as measured by provider-chosen outcomes.

Funding Sources: None

Paper Session B3: Transcranial Magnetic Stimulation for Opioid Use Disorder: Systematic Review and Protocol for a Pilot Study

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Summary: Noninvasive brain stimulation (NIBS) may represent a novel adjunctive nonpharmacologic treatment to reduce craving for opioid use disorder. We first conducted a systematic review to understand the state of the current research in this field. Next, we designed an open-label pilot study to assess the feasibility and safety of transcranial magnetic stimulation (TMS) for opioid use disorder (OUD). Participants will be those receiving buprenorphine treatment for OUD. Each will receive 10 sessions of active repetitive TMS (rTMS). Primary and secondary outcomes are feasibility and safety, and reduction in cue-induced craving, respectively. This line of research will lay the groundwork for larger, randomized, sham-controlled trials.

Background: OUD affects millions of individuals each year. Despite effective medication treatments, relapse remains common likely due to the emergence of cravings in response to cues in the environment. Neuromodulatory techniques have been proposed as adjunctive treatment strategies. rTMS is one form of NIBS, currently approved for treatment of major depression and obsessive-compulsive disorder, which shows promise for modulation of neural reward circuitry. While rTMS has demonstrated preliminary effectiveness to reduce craving for alcohol, cocaine, and tobacco, little is known about its use for OUD, so we first conducted a systematic review to understand the state of the current research in this field.

Methods: We systematically reviewed articles that utilized NIBS to affect drug-related outcomes for adults. Types of NIBS included TMS, transcranial direct current stimulation (tDCS), transcranial alternating current stimulation (tACS), and some types of vagus nerve stimulation. We searched the following online databases: PubMed, The Cochrane Library, PsycINFO (EBSCOhost, 1872-present), and Science Citation Index Expanded (ISI Web of Science, 1945-present). All drug-related outcomes were included. Study selection and data extraction was performed by two independent reviewers, and disagreements were resolved by a third reviewer. Extracted data were analyzed by summarizing the main results of each included paper. Assessment of methodologic quality and risk of bias was performed in accordance with the Cochrane Handbook. To fill the critical knowledge gap we identified, we designed an open-label pilot study to assess the feasibility and safety of rTMS to reduce cue-induced cravings for OUD. Twenty participants will be enrolled, aged 18-65 years old and who have initiated sublingual buprenorphine treatment for OUD within the last 3 months. Individuals will be excluded if they have a history of bipolar disorder, psychosis, or seizure disorder or if they currently have severe depression or moderate chronic pain or meet criteria for another substance use disorder (other than cannabis). Included participants will receive 10 sessions of open-label rTMS to the left dorsolateral prefrontal cortex. Individuals will return for follow up 1-2 weeks later. Secondary outcomes include cue-induced craving and opioid use. Additional exploratory outcomes will include depressive symptoms, cognitive performance, and neuropsychological variables.

Results: Our initial literature search yielded 5590 studies after duplicates were removed. After screening titles and abstracts, 14 full-text studies were assessed for eligibility. Five studies were determined to

meet inclusion criteria with a combined total subject of N = 150. Given the paucity of studies and small number of total subjects, no quantitative analysis was performed. These studies used TMS (n = 3), tDCS (n = 1), and the BRIDGE device (n = 1), a noninvasive percutaneous electrical nerve field stimulator, to reduce cue-induced craving (n = 3), clinical withdrawal symptoms (n = 1) or measure substance-use-related cortical plasticity (n=1). There were three randomized controlled trials, one retrospective cohort study, and one case control study. Three studies compared a noninvasive brain stimulation technique to control, and in all three, the active intervention was superior to the control condition for reduction in craving. Two studies included multiple stimulation sessions. All five studies included pre- and post-treatment outcome measurements, but none included a follow-up timepoint. With the exception of one study, all other studies had a high risk of bias in at least one category. The paucity of results we identified motivated the design of an open-label pilot study to assess initial feasibility and safety of rTMS for OUD.

Conclusions: There is a dearth of research in the area of noninvasive brain stimulation for OUD. TMS is currently being investigated for use in treating OUD in several ongoing studies. Preliminary data from this pilot will be utilized to sufficiently power future studies employing randomized, sham-controlled designs in order to evaluate cue-reactivity as well as clinical outcomes, such as retention in treatment and relapse as endpoints. In addition to assessing its effectiveness, there are many areas for future exploration, including treatment parameters, stimulation site, and the role of adjunctive therapies, both pharmacologic and psychologic.

Educational Objectives: At the conclusion of this activity, learners should be able to:

1. List 3 forms of noninvasive brain stimulation that have been studied to treat OUD.
2. Describe the rationale for investigating the use of TMS for OUD.
3. Describe an open-label study design for assessing feasibility and safety of TMS for OUD
4. Describe 3 areas for future research of TMS for OUD.

Funding Sources: This work was supported by NIH K23DA042326 (JS) and a 2017 Harvard Medical School Norman E. Zinberg Fellowship in Addiction Psychiatry Research (TM)

Paper Session B4: Prescription Drug Monitoring Program: The First Year

Mitchell Crawford, DO, *Harvard Medical School;* **Grace Chang, MD, MPH,** *Harvard Medical School*

Summary: The impact of the opioid epidemic is felt throughout the entirety of the United States. Multiple interventions have been trialed to help combat this epidemic, with mixed success. One such intervention has been the implementation of prescription drug monitoring programs (PDMP) for which many states and health systems have initiated policies on their use when prescribing controlled substances. The study institution initiated a PDMP policy in April 2016 and the purpose of this study was to evaluate its adherence in the year afterwards. A retrospective study was planned.

Background: The policy at the VA Boston Healthcare System expects all prescribers to query the PDMP on initial prescription of a controlled substance, and at least annually for schedule II or III drugs. This policy also outlines that a specific note title is to be entered into the electronic medical record (EMR) to display the results of each inquiry. Since PDMP have been described to be effective in other settings, we were interested to characterize adherence to the PMDP policy locally. A total of 695 unduplicated individuals who received unique prescriptions of opioid medications from one of four treatment settings: inpatient medicine, outpatient medicine, inpatient psychiatry, and outpatient psychiatry were identified. Clinical and patient characteristics associated with PDMP adherence were evaluated with the longer-term goal of maximizing PMDP utilization prior to the prescription of controlled substances.

Methods: All veterans who were prescribed an opioid medication in fiscal year 2017 at the study site were identified by the pharmacy and provided in a list form which was further processed to create up to 250 unique opioid prescriptions per treatment setting. Chart abstraction was completed cross-sectionally at the time of prescription to produce a database which was de-identified for analysis. Variables in the abstraction included age, gender, indication for prescription, acute or chronic use, substance use history, current engagement in mental health care, history of psychiatric hospitalization, percent service connection, concurrent benzodiazepine prescription, urine toxicology screening, and medical history (large subgroups of musculoskeletal, cardiac, pulmonary, neurological, and other). The main outcome variable was whether a PDMP note was placed in the EMR on the day of the prescription. Descriptive statistics to include means with standard deviations and frequencies as well as comparisons between groups was completed.

Results: Of the 695 charts abstracted, 12.4% had PDMP notes placed in the EMR on the day of opioid prescription. The rate of PMDP notation increased to 32.4% when PDMP notes near the time of prescription were included, which increased the mean from time of prescription to 6.8 days, with a mode and median of 0. The lowest rate of PDMP notes was seen in the inpatient medicine setting and the highest in the outpatient psychiatry setting. Notably, there were statistically significant differences in the indications for the opioid prescription in all of the treatment settings (such as 81.9% acute pain for inpatient psychiatry and 97.8% agonist substitution in outpatient psychiatry). In addition, the patient populations in each treatment setting differed in alcohol use, benzodiazepine use, cannabis use, cocaine use, opioid use, tobacco use, anxiety disorders, personality disorders, mood disorders, engagement in mental healthcare, cardiac disease, musculoskeletal disease, neurological disease, and involvement in the legal system. When evaluating patient characteristics correlating to a PDMP note being placed in the EMR, there were significant differences of whether the opioid indication was for acute pain or agonist substitution, substance use history (tobacco, benzodiazepine, cocaine, opioid, cannabis), and whether

the patient was engaged in mental healthcare, had legal trouble, or had pulmonary disease. All the findings reported are $p < .05$.

Conclusions: Rates of adherence varied by treatment site and patient characteristics, thus identifying opportunities for improvement when using the PDMP. These variations can be used to help reinforce areas of strength and address areas of weakness with future policy implementation.

Educational Objectives: At the conclusion of this activity, learners should be able to:

1. Understand the importance of proper utilization of PDMP
2. Describe utilization rates of PDMP in various treatment settings
3. Gain insight into factors in treatment settings and patient characteristics that correlate with varying utilization rates of the PDMP.

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