

**DISCUSSION/SIGNIFICANCE OF FINDINGS:** This trial proposes a novel collaborative care approach for opioid weaning using proven, easy-to-deliver positive psychology tools for pain management that, if successful, could be implemented broadly in many clinics struggling to safely reduce opioid prescribing.

73936

### Developing a Patient-Rated Outcome Measure of Alcohol and Drug Craving: A Systematic Review

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**ABSTRACT IMPACT:** The findings from this study will inform the development of an FDA-approved patient-rated outcome measure of drug and alcohol craving that can be used in clinical trials aimed at developing or testing effective treatments for substance use disorder. **OBJECTIVES/GOALS:** Craving is a potential target of investigative medications to reduce drug use due to the strong link between craving and drug use. We will identify all existing craving measures as the first step for developing an FDA-approved patient-rated outcome measure for use in clinical trials. **METHODS/STUDY POPULATION:** Following PRISMA guidelines, we will update Rosenberg's (2009) craving review by conducting a systematic review of all existing published and unpublished measures of craving for alcohol, nicotine, cannabis, opioid, and stimulant use. Electronic database (i.e., Ovid MEDLINE, Embase, PsycINFO, Web of Science, Cochrane), forward, backward, and author searches will be conducted. We will also request unpublished craving measures on major listservs (e.g., Research Society on Alcoholism, the Collaborative Perspectives on Addiction, and the College on Problems of Drug Dependence). All papers included in Rosenberg's (2009) review through September 2020 will be included. **RESULTS/ANTICIPATED RESULTS:** The findings from this review will provide a comprehensive summary of the construct of craving and its hypothesized and tested domains. This review will elucidate whether the literature suggests there are components of craving unique to alcohol, nicotine, cannabis, opioid, and/or stimulant use, and whether there are key elements of craving common across the disorders. Therefore, these findings will inform whether a single patient-rated outcome measure of craving can be developed for use across substances or if unique patient-rated outcome measures of craving need to be developed for each substance. **DISCUSSION/SIGNIFICANCE OF FINDINGS:** While many different measures of craving exist, none have gone through the developmental steps required to qualify as an FDA-approved patient-rated outcome measure on which drug treatment labeling can be based. Completing this systematic review is the first step in this process.

77286

### Intravital microscopy in the study of the tumor vasculature of patients with peritoneal carcinomatosis

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**ABSTRACT IMPACT:** Investigation of tumor-associated blood vessels may serve as an imaging biomarker of response to systemic

therapy and cancer outcomes. **OBJECTIVES/GOALS:** Aberrancies in the tumor microvasculature limit the systemic delivery of anti-cancer agents, which impedes tumor response. Using human intravital microscopy (HIVM), we hypothesized that HIVM would be feasible in patients with peritoneal carcinomatosis (PC) and generate clinical utility. **METHODS/STUDY POPULATION:** During cytoreductive surgery with hyperthermic intraperitoneal chemotherapy for PC, HIVM was performed in both tumor and non-tumor areas. The primary outcome was HIVM feasibility to measure vessel characteristics. We secondarily evaluated associations between HIVM vessel characteristics and oncologic outcomes (RECIST response to neoadjuvant therapy and disease-specific survival). **RESULTS/ANTICIPATED RESULTS:** Thirty patients with PC were enrolled. Nineteen patients (63.3%) received neoadjuvant therapy. HIVM was feasible in all patients. Compared to non-tumor (control) areas, PC areas had a lower density of functional vessels, higher proportion of non-functional vessels, smaller luminal diameters, and lower blood flow velocity. Qualitative differences in these vessel characteristics were observed among patients who had partial response, stable disease, or progressive disease after receiving neoadjuvant therapy. However, no statistically significant relationships were found between HIVM vessel characteristics and oncologic outcomes. **DISCUSSION/SIGNIFICANCE OF FINDINGS:** These novel findings comprise the first-in-human, real-time evidence of the microscopic differences between normal and tumor-associated vessels and form the basis for our larger, ongoing clinical trial appropriately powered to determine the clinical utility of HIVM (NCT03823144).

93096

### Does gender matter? Gender differences in the relationship between resting-state functional connectivity and emotion regulation in alcohol use disorder.

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**ABSTRACT IMPACT:** Our research has the potential to impact human health by identifying gender specific neural markers of emotion regulation in alcohol use disorder. **OBJECTIVES/GOALS:** Emotion dysregulation is known to be mediated by altered functional organization of the limbic system in addiction. This preliminary study sought to identify gender effects in the association between emotion regulation and resting-state functional connectivity (rsFC) of a negative affect network. **METHODS/STUDY POPULATION:** 55 individuals receiving treatment for alcohol use disorder (~2 weeks of abstinence) were recruited for this study and included in this analysis (N=55; Age: M=41.78, SD=10.66; 21 females). rsFC within a network involved in the withdrawal/negative affect stage of addiction and Personality Inventory for DSM-5 (PID-5) metrics were collected from all participants. rsFC data were pre-processed using the Human Connectome Project pipelines. Correlations between (a) rsFC within the withdrawal/negative affect network and the (b) scores of the negative affect subscale of the PID-5 instrument were conducted for each gender separately. **RESULTS/ANTICIPATED RESULTS:** Independent samples t-test showed a statistically significant gender difference in the PID-5 negative affect

scores (Males:  $M=1.02$ ,  $SD=0.66$ ; Females:  $M=1.53$ ,  $SD=0.51$ );  $t(55)=-3.002$ ,  $p=0.004$ . Only females showed a significant correlation between rsFC within the withdrawal/negative affect network and negative affect scores of the PID-5 ( $r=0.51$ ,  $p<0.05$ ). Fisher  $r$ -to- $z$  test showed significant gender differences ( $z=-1.91$ ;  $p=0.03$ , 1-tailed) in correlations coefficients representing the relationship between rsFC of the withdrawal/negative affect network and negative affect (PID-5 subscale). **DISCUSSION/SIGNIFICANCE OF FINDINGS:** Preliminary findings suggest that the relationship between neural networks mediating emotion regulation and negative affect is only found in females. These results provide valuable data to inform personalized chemical dependency treatment that targets emotion regulation specific to females.

99164

### Resting Functional Connectivity of Networks Associated with Preoccupation in Alcohol Use Disorder Predicts Time to Relapse

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**ABSTRACT IMPACT:** Our research has the potential to impact human health by identifying a neural network that can be used to predict time to relapse in individuals with alcohol use disorder. **OBJECTIVES/GOALS:** Preoccupation towards alcohol use (e.g. craving, rumination, and poor executive control) is a maladaptive behavior associated with relapse risk. We investigated whether alterations in resting state networks known to mediate preoccupation could predict time to relapse in alcohol use disorder (AUD). **METHODS/STUDY POPULATION:** 50 participants with alcohol use disorder (AUD) (Age:  $M=41.76$ ,  $SD=10.22$ , 19 females) were recruited from an addiction treatment program at ~2 weeks of abstinence. fMRI data were preprocessed with the Human Connectome Project pipeline. Strength of resting state functional connectivity (RSFC) within two networks known to mediate the 'Preoccupation go' (PG) and 'Preoccupation stop' (PS) stages of addiction were calculated. T-tests were conducted to compare RSFC between subsequent abstainers and relapsers (after 4 months). Linear regressions were conducted to determine whether RSFC (of PG and PS networks) can predict time to relapse. Craving measures were included in the model. **RESULTS/ANTICIPATED RESULTS:** 19 AUD relapsed during the 4-month follow-up period. There were no RSFC group effects (subsequent abstainers and relapsers) in the PG or PS networks. Number of days to relapse could be predicted by PG RSFC ( $F(1,17)=14.90$ ,  $p=0.001$ ,  $r^2=0.47$ ). Time to relapse increased by 13.19 days for each PG RSFC unit increase. Number of days to relapse could be predicted by PS RSFC ( $F(1,17)=9.39$ ,  $p=0.002$ ,  $r^2=0.36$ ). Time to relapse increased by 12.94 days for each PS RSFC unit increase. After adding a self-report craving measure (i.e. Penn Alcohol Craving Scale) in the prediction model, both PG and PS RSFC still significantly predicted time to relapse. Craving metric did not predict time to relapse. **DISCUSSION/SIGNIFICANCE OF FINDINGS:** RSFC in

preoccupation networks during short-term abstinence predicted time to relapse. These preliminary findings highlight promising targets for AUD neuromodulation interventions aimed to reduce relapse. Future larger scale studies that examine the effects of covariates and mediators are needed.

## Commercialization/Entrepreneurship

### Digital Health/Social Media

21968

### Adapting a global telehealth model to solve U.S. healthcare needs: age-related hearing loss as a test market

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**ABSTRACT IMPACT:** We are adapting a global telehealth platform and model of care to the U.S. context in order to solve the problem of undertreatment of age-related hearing loss and, in turn, facilitate healthy aging and social engagement among older adults. **OBJECTIVES/GOALS:** Intelhealth is a nonprofit startup that provides medical care to last-mile populations in India by equipping frontline health workers with an open-source digital assistant and telemedicine platform. Here, we explore how this technology and model of care might be adapted to address health inequities in the context of the U.S. healthcare system. **METHODS/STUDY POPULATION:** We first sought to identify a specific healthcare need that we could address as a case study on applying the Intelhealth model more broadly in the U.S. context. We began with a needs assessment, wherein we conducted primary ethnographic research, expert interviews, and literature review to identify problems in the general areas of health disparities, community health workers, and telemedicine accessibility. We then scored each need on clinical impact, feasibility, business potential, and strategic fit. After a top need was selected, a root cause analysis was performed. Brainstorming and solution concepting will be followed by prototyping, iterative design with primary stakeholder feedback, usability testing, and finally implementation and validation of the solution. **RESULTS/ANTICIPATED RESULTS:** Of 106 needs, the most highly scored was undertreatment of age-related hearing loss (ARHL). The third most common chronic condition in the U.S., ARHL presents a significant barrier to healthy aging and the single largest modifiable risk factor for dementia; yet only 15% of those with ARHL regularly use hearing aids. Thus, a large market segment - nearly 30 million Americans - is underserved by the current hearing care paradigm. Root cause analysis revealed that the primary reasons for hearing aid non-use include stigma around aging, denial of hearing loss, poor awareness of resources, and insufficient education around proper use and maintenance. These barriers, being primarily sociocultural in nature, may be optimally addressed by community health workers, making ARHL an ideal fit for the Intelhealth model. **DISCUSSION/SIGNIFICANCE OF FINDINGS:** We have identified ARHL as an