of fractionated radiation and weekly nab-paclitaxel was safe and well tolerated. This regimen represents a potentially promising therapy for patients with unresectable and borderline resectable pancreatic cancer and warrants further investigation.

2224

Characterizing vigilant thoughts and behaviors that disrupt sleep in veterans and utilization of cognitive techniques

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OBJECTIVES/SPECIFIC AIMS: Sleep disturbance is a common problem following military deployment. Insomnia is associated with other adverse psychiatric and medical health outcomes. There are specialized cognitive behavioral therapies that can effectively treat insomnia; however, these tend to emphasize dysfunctional beliefs about sleep rather than nocturnal vigilance. Deployment to a threatening environment can engender nocturnal vigilance, which appears to be a salient feature of sleep disturbance in formerly deployed veterans. The purpose of this analysis is to characterize sleep-interfering thoughts and behaviors observed in an ongoing pilot study of a novel 2-session intervention incorporating various cognitive techniques to improve sleep in veterans. METHODS/STUDY POPULA-TION: To date, 10 formerly deployed US veterans with disturbed sleep have been recruited from the greater DC area. Participants are assessed at baseline, receive 2 intervention sessions, and are again assessed in 3 months. Sleep-interfering thoughts and behaviors are evaluated via self-report forms including the Fear of Sleep Inventory (FoSI), interviews, and prospective diaries. A portion of both intervention sessions addresses vigilant behaviors and sleep-interfering thoughts by teaching participants 1 of 4 techniques that target nocturnal vigilance: cognitive defusion, body scan, self-guided pleasant imagery, and dream rescripting. RESULTS/ANTICIPATED RESULTS: All of the first 10 participants endorsed sleep-interfering thoughts on the Fear of Sleep Index (FOSI) at a severity level of at least "a few times per month" (rating of ≥ 1), including several regarding previous trauma (#5) and nightmares (#10 and #16). Other elicited thoughts included thoughts about their environment (n = 6), sleep (n = 5), social or occupational concerns (n = 8), nightmares (n = 5), and health (n = 4). All of the first 10 participants endorsed vigilant behaviors, including being over-attentive to their environment (n = 7), checking behaviors (n = 6), and being "on-guard" (n = 8). Cognitive technique was selected by the participant in collaboration with the facilitator. Customized recommendations were given as to the timing and duration of practice, but all participants were instructed to practice at least once daily. Three participants (n = 3) were fully compliant with their cognitive technique recommendations (choosing a body scan or imagery), 5 were partially compliant, and 2 were not compliant (both chose cognitive defusion). There was a significant reduction in sleep onset latency and wake after sleep onset from baseline to post-treatment ($p < 0.05$). DISCUSSION/SIGNIFICANCE OF IMPACT: The preliminary data suggests that veterans exhibit cognitive and behavioral patterns that involve vigilance and interfere with sleep and demonstrates the need for an intervention targeting the link between nocturnal vigilance and sleep disturbance. More veteran participants and feedback are needed to optimize the efficacy and effectiveness of this sleep training.

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The effect of family history, alcohol expectancies, and sex differences on hangover symptoms following intravenous alcohol self-administration in nondependent drinkers

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OBJECTIVES/SPECIFIC AIMS: The current study examined hangover following IV alcohol self-administration (IV-ASA) using the Computer-Assisted Infusion System. The goal of the study was to identify predictors of hangover, including drinking history, alcohol sensitivity, family history, expectancies, and sex differences in nondependent drinkers. METHODS/STUDY POPULATION: The study sample included 89 healthy, nondependent drinkers aged 21–45 years. After a screening to exclude any medical illness or psychiatric disorders, participants completed an IV-ASA session. Each session consisted of a 25-minute priming phase, during which participants were prompted to press a button to receive individually standardized alcohol infusions, followed by a 2-hour "open bar" phase, during which they were instructed to recreate a typical drinking experience. Results from the IV-ASA included peak and average BrAC. Drinking patterns were

assessed using the Alcohol Use Disorders Identification Test, which provided 3 subscales: consumption (AUDIT-C), dependence (AUDIT-D), and harmful drinking (AUDIT-H). Subjective response to alcohol was measured using the Drug Effects Questionnaire (DEQ). The Alcohol Hangover Scale (AHS) was used to assess hangover for the period between participants' departure from the study unit and 10 AM the next morning. The Alcohol Effects Questionnaire (AEFQ) is a measure which includes 40 true/false statements about how alcohol typically makes respondents feel, and was used to measure alcohol expectancies. RESULTS/ANTICIPATED RESULTS: Results showed that 78% of participants endorsed having at least 1 hangover symptom following IV-ASA. The most commonly reported items were tired, thirsty, headache, and hangover. There was no association between hangover scores and the AUDIT-C or IV-ASA. Because alcohol consumption was not related to hangover symptoms, risky drinking behavior was examined. Results indicated that participants endorsing 4 or more items on the AUDIT-D plus AUDIT-H subscales showed significantly higher average hangover scores. Linear regression analyses indicated that alcohol hangover scores were associated with DEQ items feel, high, and intoxicated. Ongoing analyses are examining additional predictors of hangover including family history, alcohol expectancies, sex differences, and other alcohol sensitivity measures. DISCUSSION/SIGNIFICANCE OF IMPACT: The results indicated that risky drinking patterns and alcohol response measures were positively associated with hangover symptoms in non-dependent drinks, while no correlation between consumption and hangover symptoms were found. Since previous research has shown than greater subjective response is associated with heavy drinking and predictive of alcohol use disorder, it is possible that hangover symptoms is a marker of this relationship. Since the role of hangover in the transition from heavy drinking to disorder still remains unclear, it will be important to characterize this relationship between alcohol sensitivity and hangover as a function of drinking patterns. This understanding may help to prevent this transition from at-risk drinking to alcohol dependent drinking.

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Pilot study: Implementing Brief Dialectical Behavior Therapy (DBT-A) group skills training in a public and alternative high school setting

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OBJECTIVES/SPECIFIC AIMS: Engagement in risky behaviors is not uncommon among adolescents. Two factors associated with risk taking are difficulty regulating emotions and impulsivity. Moreover, youth who exhibit higher scores on impulsivity-like personality traits (ie, negative urgency, positive urgency, sensation seeking, lack of premeditation, and lack of perseverance) are at even heightened risk. An effective intervention decreasing risk-taking behavior among adolescent populations in clinical settings is Dialectical Behavioral Therapy for Adolescents (DBT-A), which teaches skills on emotion regulation, distress tolerance, and mindfulness. However, DBT-A has yet to be tested as an intervention for youth in a nonclinical setting. The current study aimed to fill this gap in the literature. METHODS/STUDY POPULATION: A 9-week DBT-A skills group was implemented in a public high school classroom (7th-8th graders; N = 41) and an alternative high school for at risk youth (7th-12th graders; n = 21). Of the 41 youth from the public high school classroom participated, with preintervention and postintervention data provided by 30 participants (retention of 73%). RESULTS/ANTICIPATED RESULTS: Results found a significant increase in mindfulness skills and marginally significant increase in emotion regulation skills. Although there was not an overall change in risky behavior among participants, those who were higher on lack of premeditation and positive urgency showed steeper improvements on the skills. The second study at the alternative high school is currently underway, with no current results to report. DISCUSSION/SIGNIFICANCE OF IMPACT: This study will demonstrate that DBT-A skills training is feasible in a school-based setting and shows promising preliminary evidence of decreasing risk of engagement in risky health behaviors among adolescents, particularly among high-risk youth.

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The impact of social influence and impulsivity on IV alcohol self-administration in non-dependent drinkers

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OBJECTIVES/SPECIFIC AIMS: Impulsivity is a significant predictor of alcohol use and drinking behavior, and has been shown to be a critical trait in those with alcohol use disorder. Suggestibility, or susceptibility to social influence, has been

shown to correlate with impulsivity, with highly suggestible individuals being more likely to make impulsive decisions influenced by peer groups. However, the relationship between social influence and drinking behavior is unclear. Our objective was to describe the relationship between social influence and impulsivity traits using the social delayed discounting task and potential differences in intravenous alcohol self-administration (IV-ASA) behavior. METHODS/STUDY POPULATION: Healthy, non-dependent drinkers (n = 20) completed a CAIS session, which consisted of an initial 25-minute priming phase, where subjects were prompted to push a button to receive individually standardized IV alcohol infusions, followed by a 125-minute phase during which they could push the button for additional infusions. IV-ASA measures included the peak (PEAK) and average (AVG) BrAC and Number of Button Presses (NBP). Participants completed a social delayed discounting task (SDDT), where participants were presented with the choice of a small, sooner (SS) reward or a large, later (LL) reward. Before starting the task, participants chose peers who selected either the impulsive (SI) or non-impulsive choice (S). Intermittently, the peers' choice was not shown (X) or different choices (D) were selected. Participants also completed the MISS, the Barratt Impulsiveness Scale (BIS-11), UPPS-P Impulsive Behavior Scale, and the NEO personality inventory. RESULTS/ANTICIPATED RESULTS: Participants with higher suggestibility scores had greater NBP, AVG, and PEAK BrAC in the early phase of the IV-ASA session. Higher scores on the MISS were also correlated with higher impulsivity scores including the NEO Neuroticism (N-factor) measure, BIS-11, and UPPS-P. Results also showed that the MISS score was inversely correlated with the percent of impulsive choices in the SDDT, but that this was independent of peers' impulsive or nonimpulsive choices. DISCUSSION/SIGNIFICANCE OF IMPACT: These results indicate that non-dependent drinkers that were more susceptible to social influence had heavier drinking patterns, higher IV-ASA, and higher scores on impulsivity measures. In addition, individuals that were more susceptible to social influence made more impulsive choices in general, but those choices were not affected by peer decisions during the task. As such, susceptibility to social influence may be an important determinant of impulsive choices, particularly in relation to alcohol consumption.

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Analysis of racial disparity in the whole blood and plasma of healthy volunteers using rotational thromboelastometry

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OBJECTIVES/SPECIFIC AIMS: To explore the racial differences in rotational thromboelastometry findings using whole blood and plasma samples from healthy volunteers. METHODS/STUDY POPULATION: We studied a cohort of patients at Tulane University Hospitals who came into the pre-op clinic to get blood drawn for labs. The cohort included a total of 44 patients who were otherwise healthy adult volunteers with no history of cardiovascular nor thromboembolic events, 30 African Americans and 14 Caucasians. Patients who required lab work for their upcoming surgery were asked to participate in the study by giving a sample of blood collecting in a light blue-top sodium citrate tube. We excluded patients who were currently on any anticoagulation or antiplatelet medications. We also excluded those with current or previous history of cancer, those with known bleeding disorder, and those who were on chronic transfusion protocol, or had received a blood transfusion within the last 21 days. Data collection was carried out after informed consent was obtained; we collected citrated whole-blood (WB) samples. WB samples were processed within 3 hours of phlebotomy. Platelet free plasma, obtained after centrifugation at 2500 cGy of whole blood for 20 minutes, was kept frozen at −70°C. Frozen plasma was thawed at 37°C for 5 minutes before testing. Samples were recalcified with star-tem reagent, and then the in-tem reagent was added. The latter contains an optimized concentration of ellagic acid and partial thromboplastin phospholipid from rabbit brain. Thromboelastometry (ROTEM) parameters including clotting time, clot formation time, alpha angle, maximum clot firmness, and Lysis Index after 30 and 45 minutes were determined. Data was then retrieved from the ROTEM database and put into an Excel sheet to be analyzed. RESULTS/ANTICIPATED RESULTS: Our results showed that the CFT was higher in both the plasma and the WB of Caucasians when compared with African Americans with a difference between means 137.5 ± 233.7 ($p = 0.56$) and 11 ± 7.85 ($p = 0.168$), respectively; while MCF was increased in the WB and plasma of AA with a difference between means of 1.719 ± 1.974 ($p = 0.38$) and 5.37 ± 2.49 ($p = 0.037$), respectively. In other words, the plasma of Caucasians did seem to take longer to reach the maximum firmness (however not statistically significant $p > 0.05$), while the maximum clot firmness was significantly higher in plasma of AA. In summary and compatibly with the previously published data, our results showed significantly increased prothrombotic profile in the plasma of African Americans when compared with Caucasians. DISCUSSION/SIGNIFICANCE OF IMPACT: This reinforces the role of the whole vascular system and the interaction between its different components in the pathophysiology of thromboembolic events. In one case control study, African ethnicity was associated with increased risk of DVT in parallel with significantly increased peak thrombin on thrombin generation when compared with Caucasians. With our preliminary results, we confirm these data using another tool for the assessment of the plasma in addition to comparing WB samples too. More prospective studies, with higher number of subjects evaluating the value of the results in predicting the risk of development of thromboembolic events in different ethnicities, are needed for better understanding of this disease. In addition, thromboelastometry might require adjustment for ethnicity in studies evaluating ethnically diverse populations.

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Identifying optimal multiple sclerosis (MS)-specific atrophy markers as primary endpoint for Phase II s in progressive MS

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OBJECTIVES/SPECIFIC AIMS: To identify brain regions with the highest and least variable rate of multiple sclerosis (MS)-specific atrophy using an agnostic approach, and to perform simulation-based sample size calculations for Phase II s using these regions as primary endpoint. METHODS/STUDY POPULATION: In total, 601 subjects (2638 MRI scans) were analyzed; 520 subjects with relapsing forms of MS across the spectrum of disease severity and duration were followed in a single-center prospective cohort study at an academic MS Center between 2005 and 2010 with annual 3 T MRIs and clinical visits for 5 years, including standardized 1 mm^3 3D T1-weighted images (3DT1s; 2483 MRIs). Separately, a convenience sample of 81 healthy controls (HC) was recruited from the same center and scanned longitudinally using the same MRI scanner and protocol (155 MRIs). 3DT1s were processed using FreeSurfer's longitudinal pipeline (software version 5.3). Rates of change in all cortical and subcortical regions (n = 119 brain regions) were estimated in MS patients and HC with linear mixed effects models. An effect size was calculated for each region as the difference in change over time between MS patients and HC divided by the standard error of the difference [$d = \beta$ (MS × time)/SE β(MS × time)]. Regions were ranked according to absolute effect size, and the top regions were chosen for simulation-based sample size calculations to estimate the number of subjects needed to achieve 80% power to detect a slowing of MS atrophy down to normal aging, assuming significance levels of 5% and 10%. Ten percent was included because some have advocated for a more relaxed alpha in Phase II s. RESULTS/ANTICIPATED RESULTS: Four regions (putamen, subcortical grey matter, caudate, and thalamus) yielded the smallest sample sizes. At 80% power, ~50 subjects per arm would be needed with putamen or subcortical grey matter volume, or ~80–85 subjects per arm with caudate or thalamic volume as primary endpoint. For the remaining regions, >140 subjects per arm would be needed. A 20%–30% increase in sample size was observed when α = 5% was used. DISCUSSION/SIGNIFICANCE OF IMPACT: Using an agnostic approach considering all brain regions and simulation-based sample size calculations specifically designed for longitudinal studies, putaminal, subcortical grey, caudate, and thalamic volumes are sensitive to change over time and yield feasible sample sizes for Phase II studies in MS. Because the effect size estimates incorporate normal aging, these regions represent the most sensitive outcomes for testing therapeutic interventions that target irreversible, MS-specific brain atrophy. The clinical relevance of these regions is our next focus to help inform which of these regions should be favored as primary endpoint.

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Coronary artery calcification on nongated CT scan predicts mortality and acute myocardial infarction after sepsis

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OBJECTIVES/SPECIFIC AIMS: Cardiac complications are common after hospital admission for sepsis, and elevated troponin has been associated with increased all-cause mortality. However, little is known about clinical or imaging factors that predict these cardiac events. Coronary artery calcification (CAC) is an easily identifiable imaging finding, even on nongated CT scans. The goal of this study is to identify if CAC predicts all cause mortality and acute myocardial infarction. METHODS/STUDY POPULATION: This is a single center, nonconcurrent cohort study including 899 patients who were admitted for sepsis and had a detectable TnI level from January 2013 to December 2013.