

Patients with a CT scan of the chest or abdomen done for other clinical indications within 6 months of this admission were reviewed for the presence or absence of CAC. Medical records were individually reviewed for mortality and type I acute myocardial infarctions at 1 year. RESULTS/ANTICIPATED RESULTS: In total, 144 patients (mean age 57 ± 14.8 years, 48% female) were included in the analysis. CAC was seen in 59% of these scans. Compared to those without detectable CAC, the CAC group had similar APACHE score (18 vs. 16.6, $p=0.259$), peak Tnl (3.64 vs. 2.11 mg/dL, $p=0.363$), aspirin (63% vs. 51%, $p=0.144$), and β blocker use (90% vs. 85%, $p=0.357$) and had higher statin use (48% vs. 27%, $p=0.013$). CAC was associated with increased all-cause mortality (59.5% vs. 38.9%, $p=0.016$) and type I myocardial infarctions (10.6% vs. 1.7%, $p=0.039$) compared with those without CAC. DISCUSSION/SIGNIFICANCE OF IMPACT: Coronary artery calcification is often seen when patients present with a noncardiac acute illness, such as sepsis, often making a new diagnosis for these patients. Mortality and acute MI after sepsis can be predicted by coronary calcification, and identify patients who should be targeted for therapy and close follow-up.

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HPA axis predictors of cue-induced intravenous alcohol self-administration in non-dependent drinkers

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OBJECTIVES/SPECIFIC AIMS: Alcohol craving, particularly in response to stress and alcohol cues, can lead to relapse in alcohol-dependent individuals. Hypothalamus-pituitary-adrenal (HPA) axis markers such as the cortisol to corticotrophin (CORT:ACTH) ratio have been shown to be a significant predictor of alcohol relapse. Our objective was to evaluate the influence of HPA-axis measures on intravenous alcohol self-administration (IV-ASA) in binge and nonbinge drinkers. METHODS/STUDY POPULATION: Healthy, non-dependent binge drinkers ($n=14$) and nonbinge drinkers ($n=11$) participated in this study. They underwent 3 personalized imagery sessions, where they heard 5-minute personalized audio scripts designed to trigger stress, alcohol craving, and neutral-relaxation states. Immediately following these cues, participants were given access to alcohol using a novel IV-ASA paradigm for 120 minutes. Serial blood samples were collected for cortisol and ACTH levels. Subjective measures were collected serially using the Subjective Units of Distress Scale (SUDS), Drug Effects Questionnaire (DEQ), and Alcohol Urge Questionnaire (AUQ). Analyses were conducted using linear regression. RESULTS/ANTICIPATED RESULTS: Results showed that peak and average ACTH levels as well as the CORT:ACTH ratio during the early phase of the IV-ASA session following the stress and alcohol cues were significantly higher than the neutral script; this effect was seen primarily in binge drinkers. After script administration, a greater change from baseline for ACTH predicted time to peak BrAC during IV-ASA. Gender and binge group predicted AUQ MAX (peak alcohol craving over the entire study session) and WANT MAX (peak "want more alcohol" scores over the session). There was a significant correlation between IV-ASA and increased ACTH peak and average values in binge drinkers. The DEQ and AUQ measures were positively correlated with ACTH peak and ACTH change from baseline. DISCUSSION/SIGNIFICANCE OF IMPACT: These findings, to our knowledge, are the first demonstration that exposure to both stress and alcohol cues lead to an increase in ACTH during cue-induced IV-ASA, particularly in binge drinkers. These results suggest that changes in HPA-axis reactivity following stress and alcohol may be important determinants of alcohol consumption in non-dependent binge drinkers.

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The effects of fecal microbiota transplantation on the gut microbiota in subjects with *Clostridium difficile* infection

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OBJECTIVES/SPECIFIC AIMS: *Clostridium difficile* is the most common cause of infectious antibiotic associated diarrhea. It is often refractory to antimicrobial therapy and fecal microbiota transplantation (FMT) is emerging as a therapeutic

option. The objective is to characterize the direct effects of FMT on the gut microbiota. METHODS/STUDY POPULATION: Fecal specimens were obtained from a cohort of 29 subjects with recurrent *C. difficile* infection who received FMTs from 1 of 4 healthy donors as part of a phase 2 trial (Rebiotix). Fecal specimens were collected from the subject before FMT and up to 6 months post FMT. 16S rRNA sequencing and whole-genome shotgun sequencing were used to assess microbial community composition as compared by weighted Unifrac. RESULTS/ANTICIPATED RESULTS: Before treatment, the microbial community of subjects with *C. difficile* infection was highly distinct from the composition of the healthy donors in terms of metabolic profile. Quantification of phylogenetic community distance from donor by weighted Unifrac distance showed a significant decrease within the 1st week (Wilcoxon rank sum, $p < 0.01$). This metric was predictive of both treatment failures and antibiotic resistance gene count (LR = 22.45, $p < 0.0001$). DISCUSSION/SIGNIFICANCE OF IMPACT: We conclude that distance from donor is a useful metric to quantify FMT success and that FMTs are a promising treatment for otherwise untreatable carriage of antibiotic resistance genes and organisms.

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Delayed rewarming for neuroprotection in infants following congenital heart surgery: A safety study

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OBJECTIVES/SPECIFIC AIMS: Congenital heart disease (CHD) is the most frequently occurring birth defect in the United States affecting about 40,000 infants born every year. Despite significant advances in postsurgical survival, developmental outcomes remain disproportionately poor. Therapeutic hypothermia has been used for neuroprotection during cardiac surgery since the 1950s. Infants undergoing cardiac surgery are typically cooled to 28–33°C during the operation and then rapidly rewarmed to normothermia following surgery at a rate of 1°C every 3–5 minutes to minimize concerns surrounding the risks associated with prolonged bypass exposure. However, emerging evidence from animal models has shown rapid temperature changes following surgery may diminish or even negate the neuroprotective effect of intraoperative hypothermia. No prospective studies have assessed the safety or impact of alternative approaches to postoperative temperature management on the outcome of infants with CHD undergoing cardiac surgery. Therefore, we conducted a pilot study to examine the safety of a novel application of a temperature-regulating device to slowly rewarm infants with congenital heart disease over the 12 hours following cardiac surgery. METHODS/STUDY POPULATION: From November 2014 to July 2016, infants with CHD requiring surgery with cardiopulmonary bypass before the age of 12 months were prospectively recruited. Infants were randomized in blocks of 3 with 1 allocated to standard of care and 2 to the experimental protocol. Infants assigned to the standard of care were rewarmed in the operating room while on bypass at a rate of 1°C every 3–5 minutes back to a temperature of 37°C. Infants assigned to the experimental intervention, were rewarmed on bypass to 35°C and then over the subsequent 12 hours following surgery, gradually rewarmed using an FDA approved "cooling blanket" to increase temperature by 0.3°C every 2 hours for 6 hours and then by 0.2°C every 2 hours for 6 hours until the goal temperature of 36.5°C was achieved. Frequency of serious, moderate and other adverse events were tracked. Detailed vital sign data was collected hourly for the first 12 hours after surgery and then every 6 hours for the next 36 hours and included temperature, highest and lowest heart rate, highest and lowest systolic blood pressure, and highest and lowest diastolic blood pressure. Presence or absence of abnormal cardiac rhythms was recorded per 24-hour interval. Chest tube output was recorded in cc/kg/8 hours for as long as the chest tube was in place. Laboratory data points included serum creatinine level, serum glucose level, liver function tests (AST and ALT), platelet count, hematocrit level, PTT, INR, fibrinogen, white blood cell count and lactate. Blood samples for biomarkers of brain injury (s100b and NSE) were obtained on all infants at the following 4 intervals; the preoperative setting for baseline, postoperatively after bypass, on postoperative day 1, and on postoperative day 2. For this safety study, the primary outcome measure was a composite outcome of the frequency of serious adverse events as well as the frequency of any adverse events and was compared among treatment groups. Data were analyzed using an intent to treat analysis. The study was approved by the Maine Medical Center Institutional Review Board. RESULTS/ANTICIPATED RESULTS: Seven infants were randomized to the standard of care group and 9 were randomized to the experimental group. There were 2 exclusions after randomization in the standard of care group with 1 death in the operating room and 1 unsuccessful attempt to wean from bypass. The mean temperature upon arrival to the PICU for the experimental infants was 35.2°C (range 34–36°C) and for the standard of care infants was 37.5°C (range 36.9–38.9°C). For the first 8 hours after surgery, infants in the standard of care group had mean temperatures over 37.0°C. There were no significant differences in the