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Cardio-Omentopexy to Reduce Myocardial Scarring and Promote Regeneration

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OBJECTIVES/GOALS: While the current management of single ventricle repairs has drastically prolonged life expectancy, the repair fails over time primarily through pathologic inflammation and fibrosis. Our goal is to demonstrate that cardio-omentopexy can decrease inflammation and fibrosis in swine after cryoinjury. METHODS/STUDY POPULATION: A cryoinjury is created using a liquid nitrogen cooled probe to the right ventricle of 20kg swine. In half the groups the omentum is attached to the heart over the area of the injury. The swine are recovered and monitored for 4 or 8 weeks at which time they are euthanized. The injured area is evaluated via histological and immunohistochemical testing for markers of inflammation and scarring including collagen type, scar area, macrophage activity. RESULTS/ANTICIPATED RESULTS: We anticipate that the addition of omentopexy to cryoinjury will decrease scar area, fibrosis and markers of chronic inflammation. Additionally, we expect an increase in myocytes in the area of injury. We expect that this will occur through the anti-inflammatory and protective mechanism of the omentum. DISCUSSION/SIGNIFICANCE: Cardio-omentopexy, if able to decrease fibrosis and preserve myocytes, may provide a useful adjunct to the treatment of single ventricle repair by prolonging the longevity of the repair. Additionally, as these repairs often require a ventriculotomy, decreasing the operative scar may preserve myocardial function.

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Chronic cadmium exposure is associated with Alzheimer's Disease-related mortality in adults over age 60 in a representative US sample

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OBJECTIVES/GOALS: Cadmium is a widespread neurotoxic metal pollutant; however prior study results of Cd and later-life cognition are mixed. We investigated association of urinary cadmium on Alzheimer's Disease (AD) mortality risk, accounting for key co-pollutants smoking and lead, in the presence of competing risks. METHODS/STUDY POPULATION: We included 5692 persons, 60 years old from the 1998-2018 National Health and Nutrition Examination Survey. Underlying cause of death was determined via linked 1999-2019 National Death Index data. Urinary cadmium (UCD) reflects prolonged exposure and was adjusted for creatinine. We used multiple imputation (5 iterations) to recapture substantial model observation drop-out (N=782). We used three Cox proportional hazard models to estimate hazard ratios (HR) and 95% confidence interval (CI) per unit increase in UCD and time to AD mortality: a competing risks model, a survey-weighted model, and a baseline model including neither, all adjusted for demographic characteristics, lead, and smoking. RESULTS/ANTICIPATED RESULTS: Follow-up ranged from 0 to 20.8 years (mean 8.2 years), with a total of 1,987 individuals deceased (14,232 person-years at-risk), including 88 individuals

dying from AD. Mean UCD was 0.50 μg/g creatinine (standard error=0.01). In baseline and survey-weighted models fully adjusted for NHANES cycle, poverty income ratio, age, race/ethnicity, sex, marital status, education, smoking status, and blood lead levels, a per unit increase in UCD was associated with approximately twice the rate of AD mortality (baseline model HR: 1.92, 95% CI: 1.28, 2.89; survey-weighted model HR: 2.08, 95% CI: 1.42, 3.06). In the competing risks model, this association was attenuated (HR: 1.58, 95% CI 1.06 2.36). DISCUSSION/SIGNIFICANCE: Our study finds chronic cadmium exposure associated with AD mortality even after accounting for competing risks of AD mortality and confounding effects of cigarette smoking and lead exposure, strengthening the evidence that long-term cadmium exposure adversely affects later-life cognitive health.

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Clinical Manifestations of Neuroaxonal Injury

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OBJECTIVES/GOALS: The preclinical stage of Alzheimer disease (AD) is a clinically silent period that can be detected through neuroimaging and biofluid biomarkers. The goal of this study was to determine whether performance of complex daily tasks is associated with plasma biomarkers of brain amyloidosis or neuroaxonal injury in cognitively normal (CN) older adults. METHODS/STUDY POPULATION: This is a cross-sectional analysis of an ongoing longitudinal cohort study. CN older adults performed three complex daily tasks (shopping, checkbook balancing, medication management) from the Performance Assessment of Self-Care Skills in their home. Tasks were scored for independence, with more assistance required indicating worse performance. Participants had a plasma sample obtained within two years of completing the tasks. Plasma amyloid (Aβ42 and Aβ40) were evaluated by high precision immunoprecipitation mass spectrometry assays and neurofilament light (NfL) was measured with single molecule array (Simoa) assays. Nonparametric partial correlations were used to quantify the associations between task performance and plasma AD biomarkers, controlling for age and gender. RESULTS/ANTICIPATED RESULTS: 105 CN participants (mean age 74.7 years, 55% female, 88% white) were included. After controlling for age and gender, worse performance of complex daily tasks (more assistance required) was associated with increased plasma NfL (Spearman's: 0.23, p=0.04) but not plasma Aβ42/Aβ40. DISCUSSION/SIGNIFICANCE: This study suggests that worse performance of complex daily tasks in CN older adults may be associated with increased plasma NfL a marker of neuroaxonal injury, but not with plasma amyloid. These findings could lead to a better understanding of clinical changes that may occur prior to the onset of noticeable memory symptoms in AD or related dementias.

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Comparison of induction agents for rapid sequence intubation in refractory status epilepticus*

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OBJECTIVES/GOALS: Multiple induction agents can facilitate rapid sequence intubation (RSI) in management of refractory status

epilepticus (rSE), many which have anti-seizure properties. We examine the anti-seizure efficacy and safety of induction agents used during RSI in the management of rSE. METHODS/STUDY POPULATION: We conducted a single-center retrospective review of patients admitted to the neuro-ICU intubated for management of rSE. Propofol, ketamine and benzodiazepines were considered anti-seizure medication (ASMs), etomidate was not. Patients were treated with propofol or midazolam following intubation. Our primary outcome was clinical or electrographic recurrence of SE within 12 hours of intubation. Exploratory outcomes included time to recover command following, duration of mechanical ventilation (MV) and complications related to intubation. We used multivariable logistical regression to evaluate outcomes between patients induced with ASMs and etomidate. A Fisher exact test was used to compare rSE cessation in a subset of patients with continuous electroencephalography (cEEG) at the time of intubation. RESULTS/ANTICIPATED RESULTS: We identified 149 induced for RSI in management of rSE: 88 patients intubated using ASMs (propofol,n=56; ketamine,n=14; benzodiazepines,n=18) and 61 patients intubated with etomidate. Forty-one patients had recurrence (29.9% ASMS, 24.6% etomidate). The induction agent was not associated with recurrence of SE, time to command following, or duration of MV. Twenty-seven patients had cEEG monitoring at the time of intubation. Sixteen of the 22 patients induced with ASMs had cessation of rSE with induction, while 1 of 5 intubated with etomidate had cessation (Fisher exact test, p=0.047). There were 34 patients with post-induction hypotension (22.9% ASMs, 22.9% etomidate (Fisher exact test, p=1)). DISCUSSION/SIGNIFICANCE: Induction with an anti-seizure medication during intubation was more likely to halt rSE, but did not decrease the likelihood of clinical or electrographic recurrence of rSE and may not affect time to recovery of command following or duration of MV.

COVID-19 and Mental Health: Comparing the mental health between African Americans and Whites in 2019 (before COVID-19) and 2020 (during COVID-19) using NSDUMH in the United States

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OBJECTIVES/GOALS: The purpose of this study is to compare the mental health of African Americans to Whites during 2019 and 2020 using the a National Survey on Drug Use and Mental Health (NSDUMH). METHODS/STUDY POPULATION: Secondary data analysis from the National Survey on Drug Use and Health. The data consisted of 55,772 observations, 3,090 variables. This study will consist of the United State adult data population from 2019 and 2020 using the National Survey on Drug Use and Mental Health (NSDUMH). RESULTS/ANTICIPATED RESULTS: The results of this research will be produced from the following analysis. The analysis will consist of a secondary data analysis from the National Survey on Drug Use and Mental Health (NSDUMH). The primary independent variable of interest is race. All the indicator (race, sex, insurance, etc). Dependent variable is the mental health of African Americans and Whites. This is the variable in the NSDUMH labeled as the Major Depressive Episodes (MDE). The data analysis will be conducted using univariate analysis describing the study population. Bivariate analysis will be performed using chi-square. Since our dependent variable will be dichotomous we will be using several logistic regressions. DISCUSSION/SIGNIFICANCE: Strengthen mental health and psychosocial support services as part of strengthening preparedness, response and resilience to COVID-19 and future public health emergencies. Also adopt the updated Comprehensive Mental Health Action Plan for the future.

COVID-19 and Moroccan nursing students: A multicenter cross-sectional survey on their related knowledge, attitudes and practices

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OBJECTIVES/GOALS: The purpose of our study was to assess the knowledge, attitudes and practices of nursing students during the COVID-19 pandemic. METHODS/STUDY POPULATION: Data were collected using an online questionnaire consisted of demographic characteristics and 24 items about COVID-19-related knowledge, attitudes and practices. RESULTS/ANTICIPATED RESULTS: A total of 1,216 nursing students participated in this study. About 82% of the participants reported that the COVID-19 virus spreads via respiratory droplets of infected individuals. The most clinical symptoms of COVID-19 correctly identified by participants were fever (97.6%), dry cough (92.4%), dyspnoea (82%) and fatigue (74.9%). More than 56.6% of the participants were afraid of being affected by COVID-19. Almost all participants reported that they avoid crowded places frequently. About 93.4% of the participants declared frequently wearing face mask when leaving home, and 85.5% maintained social distancing frequently. However, only 47.4% reported that they frequently washed their hands. About 51% stated that coronavirus outbreak has considerably changed their daily routines. DISCUSSION/SIGNIFICANCE: Sensitization and education campaigns are needed to improve their preventative practices, such as hand hygiene and wearing face mask. In addition, it may be of importance to incorporate competences into curricula to improve knowledge, attitudes and practices of future health professionals and to prepare them for emergencies and outbreaks.

Cross-ancestry analysis of preeclampsia identifies novel maternal susceptibility loci*

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OBJECTIVES/GOALS: Preeclampsia (PE) is a hypertensive disorder of pregnancy, affecting 5 - 7% of pregnancies worldwide. A major cause of morbidity and mortality, PE is also associated with subsequent adverse health outcomes, including long-term increased risk of cardiovascular disease. The genetics conferring increased risk for PE are incompletely understood. METHODS/STUDY POPULATION: We performed a cross-ancestry, fixed-effects meta-analysis, incorporating both published and unpublished genome-wide association study (GWAS) summary statistics. In