

our projected sample size is small and may impact the ability to examine this interaction. **DISCUSSION/SIGNIFICANCE:** Black Americans, particularly in the Deep South, are at elevated risk for PAD and critical limb ischemic events, such as amputation. Understanding CV health metrics and SDoH characteristics among adults with PAD is essential to reduce disparities in care and provide valuable information for those at highest risk for complications.

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### The Transcriptional Function of TCF7L2 is Spatially Restricted in Liver and Regulates Zonated Metabolic Pathways Which Contribute to Liver Disease\*

Iriscilla Imabary Ayala<sup>1</sup>, Skanda K Hebbale<sup>2</sup>, Chris E. Shannon<sup>2</sup>, Ivan Valdez<sup>2</sup>, Marcel Fourcaudot<sup>2</sup>, Terry M. Bakewell<sup>2</sup>, Madelaine Sholto<sup>3</sup>, Thomas Vallim<sup>3</sup> and Sami Heikkinen<sup>4</sup>

<sup>1</sup>University of Texas Health Science Center; <sup>2</sup>Diabetes Division, University of Texas Health, San Antonio, TX, USA; <sup>3</sup>Department of Medicine, Division of Cardiology, University of California, Los Angeles (UCLA), Los Angeles, CA, USA and <sup>4</sup>Department of Medicine, University of Eastern Finland, Kuopio, Finland Luke Norton, Diabetes Division, University of Texas Health, San Antonio, TX, USA

**OBJECTIVES/GOALS:** Single nucleotide polymorphisms in the transcription factor 7-like 2 (TCF7L2) gene are associated with Type 2 Diabetes (T2D) and nonalcoholic fatty liver disease (NAFLD). The metabolic function of TCF7L2 in the liver remains to be fully elucidated, but we hypothesized that TCF7L2 contributes to NAFLD through regulation of zonal metabolic pathways. **METHODS/STUDY POPULATION:** Using single nuclei RNA sequencing, we examined Tcf7l2 expression in periportal (PP) hepatocytes around the portal triad and pericentral (PC) hepatocytes surrounding the central vein of the liver. To visualize TCF7L2 transcriptional activity we used a TCF reporter mice, which expresses an H2B-eGFP fusion protein downstream of the conserved TCF DNA binding site. We disrupted Tcf7l2 transcriptional activity in mouse liver by breeding mice with a floxed Tcf7l2 exon 11, which encodes part of the DNA binding domain (DBD), to albumin-Cre mice (Hep-TCF7L2ΔDBD). Eight-week-old mice were fed a choline-deficient amino acid-defined high fat (CDAHFD) diet for 8 weeks. In liver samples harvested from these mice, we examined disruption to several key zonated metabolic pathways, and quantified the development of fibrosis. **RESULTS/ANTICIPATED RESULTS:** Single nuclei analysis revealed that Tcf7l2 mRNA was expressed primarily in parenchymal cells of the liver but was ubiquitous across the liver lobule. However, in immunofluorescence analysis of TCF reporter mice, the transcriptional activity of TCF7L2 was highly restricted to PC hepatocytes. Classic PC hepatocyte markers, including glutamine synthetase (Glu), were absent in Hep-TCF7L2ΔDBD mice. Following the CDAHFD, Hep-TCF7L2ΔDBD mice developed more severe fibrosis in histological analysis, and expressed elevated levels of genes involved in fibrogenesis, collagen synthesis and TGFβ signaling. Hep-TCF7L2ΔDBD mice also displayed hepatic cholesterol accumulation following the CDAHFD, which was likely the result of impaired pericentral bile acid synthesis. **DISCUSSION/SIGNIFICANCE:** Our results suggest that TCF7L2 plays an important role in the regulation of zonated metabolic pathways, which may contribute to the development of fibrosis. Ongoing analyses are exploring the mechanisms regulating the zonal transcriptional activity of TCF7L2.

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### Evaluating serum copper and kidney function in a cohort of bariatric surgery patients

Katherine McKeon<sup>1</sup>, Michael Cook<sup>2</sup>, John Baker<sup>3</sup>, Kyle LaPenna<sup>2</sup>, Hua He<sup>3</sup>, Amanda Anderson<sup>4</sup> and Felicia Rabito<sup>1</sup>

<sup>1</sup>Tulane University School of Public Health and Tropical Medicine; <sup>2</sup>Louisiana State University Health Sciences Center, University Medical Center New Orleans; <sup>3</sup>Tulane University School of Medicine, University Medical Center New Orleans and <sup>4</sup>University of Alabama-Huntsville

**OBJECTIVES/GOALS:** High serum copper (Cu) levels have previously been described in bariatric patients. The kidneys are a target organ for Cu toxic insult but the role of Cu on kidney function (eGFR) is uncertain. This study examines the association between Cu and eGFR in a bariatric population in Southeast Louisiana. **METHODS/STUDY POPULATION:** Seven hundred fifty patients will be recruited from the Bariatric Center of the University Medical Center in New Orleans. Inclusion criteria include: age ≥ 18 years, clinic visit between June 1, 2018 – May 31<sup>st</sup> 2024, and having a serum Cu test result. Covariables such as inflammatory markers and hormonal contraception use will be assessed as potential confounders. Blood pressure will be assessed as a potential effect modifier. Data will be obtained from electronic medical records. Two cohorts will be assembled, a pre-surgery cross-sectional cohort and another followed post-surgery. Separate models will be developed stratified by race-ethnicity. **RESULTS/ANTICIPATED RESULTS:** In a pilot study of bariatric patients 26% had elevated (>155 mcg/dl) serum Cu and pronounced racial differences were noted. Characteristics consisted of a mean BMI of approximately 50 kg/m<sup>2</sup>; 91% were female and 69% were Black. Black patients had approximately double the prevalence (OR 1.98; 95% CI: 1.15, 3.4) compared to white patients. Due to the dual nature of the kidneys' involvement in metabolism via excretion and being the target organ for toxic insult, racial differences in exposure, coupled with the disproportionate rates of chronic kidney disease in Black adults, may be an explanation for the association between elevated Cu levels and eGFR in Black adults in this study. **DISCUSSION/SIGNIFICANCE:** Results from this study will provide insight into the prevalence of Cu and its association with kidney function in a bariatric population. Chronic kidney disease or other forms of renal impairment may result in the need for more conservative guidelines for dietary copper in bariatric medicine.

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### Avoiding Death From Stimulant Toxicity: Resiliency Among People Who Use Stimulants

Nigel Parker Anderson, Phillip Coffin and Vanessa McMahan  
University of California, San Francisco

**OBJECTIVES/GOALS:** The project investigates the role that resiliency may play within individual, interpersonal, social, and structural contexts in protecting against acute lethal stimulant (meth/amphetamine or cocaine) toxicity. Identifying preventative factors is crucial in developing and implementing risk reduction strategies for people who use stimulants. **METHODS/STUDY POPULATION:** This is a qualitative study involving in-depth interviews via questionnaire assessing resiliency factors among persons living in San Francisco

who have used primarily either meth/amphetamine or cocaine for at least 5 years. The interviews will be coded for salient and recurrent themes and analyzed for code frequency, cooccurrences, clustering of themes and representative excerpts to highlight emergent themes as well as stressors and resilience factors at multiple levels. We aim to assess for substance use patterns, multiple domains of resiliency, medical and psychiatric complaints, and risk reduction strategies. We will recruit participants to match recent decedents from acute stimulant toxicity in various domains including salient demographic information and neighborhood characteristics. **RESULTS/ANTICIPATED RESULTS:** The anticipated results include a qualitative interview guide for living persons using stimulants in San Francisco to be used to gain insight into the community, illustrate participants' substance use practices, and allow for better characterization of several discrete resiliency factors that have protected the participants and other community members from suffering lethal stimulant toxicity. We expect to identify individual components (e.g. use patterns, use of harm reduction supplies), interpersonal/social factors (e.g. drug using network, friendships, community connection), and structural influences (e.g. access to care, safe use sites, house and economic stability) that all play a role in resiliency against lethal stimulant toxicity. **DISCUSSION/SIGNIFICANCE:** Stimulant use is common, along with rising deaths involving stimulants in urban counties and in smaller rural/non-metro counties which are disproportionately affected, posing a public health challenge. We will find discrete, modifiable risk and resiliency factors that can be manipulated to minimize the chances of outcomes like overdose and death.

### **Racial-Ethnic Differences in Antipsychotic Initiation Among Youth with Diagnosed ADHD, Depression, or Conduct Disorder**

Linnea Sepe-Forrest<sup>1</sup>, Richard Meraz<sup>2</sup>, Sydney Adams<sup>2</sup>, Brian M. D'Onofrio<sup>2,3</sup> and Patrick D. Quinn<sup>2,3,4</sup>

<sup>1</sup>Indiana University Bloomington; <sup>2</sup>Department of Psychological & Brain Sciences, Indiana University Bloomington; <sup>3</sup>Program in Neuroscience, Indiana University Bloomington and <sup>4</sup>School of Public Health

**OBJECTIVES/GOALS:** This study examined racial-ethnic differences in antipsychotic initiation within psychiatric diagnostic groups. This is a follow-up to our prior work, which reported that, overall, youth from minority backgrounds had 30-65% lower odds of initiating antipsychotics compared to White youth. **METHODS/STUDY POPULATION:** This study used 2009-2021 data from Optum's<sup>®</sup> Clinformatics<sup>®</sup> Data Mart, a database containing longitudinal patient information from nationwide commercial insurance claims. We created three separate samples of antipsychotic users and matched non-user controls between the ages of 6-17 years old. These groups contained individuals with clinically diagnosed ADHD, conduct disorder, and depressive disorder, respectively. We used conditional logistic regression to estimate the odds of antipsychotic initiation based on race-ethnicity within each diagnostic group. **RESULTS/ANTICIPATED RESULTS:** There were no racial-ethnic differences in the odds of antipsychotic initiation among youth diagnosed with ADHD. Among youth with depression diagnoses, Asian youth had 19% lower odds of initiating antipsychotics and Hispanic youth had 11% lower odds compared with White youth. Similar

results were observed for conduct disorders, with Asian and Black youth having approximately 10% lower odds of initiating antipsychotic treatment and Hispanic youth having 18% lower odds relative to White youth. **DISCUSSION/SIGNIFICANCE:** Previously observed lower rates of antipsychotic initiation among racial-ethnic minority groups may be at least partially due to factors leading to disparities in diagnosis. Further research is needed to evaluate factors that may lead to differential antipsychotic use, as the disparities may occur upstream of receiving clinical diagnoses.

### **29 Cardio-Omentopexy to Reduce Myocardial Scarring and Promote Regeneration**

Stephen Stachnik, Dawn Parsell, Joseph Forbess and Kristopher Deatrick

University of Maryland Medical Center

**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 15-20kg swine for three minutes. 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:** Currently, we have successfully validated the animal model to create myocardial scar validated by histological testing. 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.

### **30 Characteristics of Infant Emergency Department Utilization**

Mary Beth Howard<sup>1</sup>, Leticia M. Ryan<sup>2</sup> and Oluwakemi Badaki-Makun<sup>2</sup>

<sup>1</sup>Johns Hopkins School of Medicine and <sup>2</sup>Johns Hopkins School of Medicine, Department of Pediatrics

**OBJECTIVES/GOALS:** Frequent utilizers of emergency departments (ED) make up a substantial share of overall ED use. Within pediatric emergency departments (PED), infants represent an age group that make up a disproportionate share of PED visits. The objective was to compare patterns of PED use for children less than 1 year of age by visit frequency and resource utilization. **METHODS/STUDY POPULATION:** Retrospective cohort study of infants less than 1