

>90%. When the proportion of verification of positive test results was <30% or >70%, the DV method yielded smaller bias for the estimated specificity than the PV method. However, the PV method generated a much smaller mean square error (MSE) for specificity than the DV method when the proportion of verification for positive test results was >50%. Although the disease prevalence was >10% and the proportion of verification of positive test results was <30%, the DV method resulted in a smaller MSE for specificity. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Disease prevalence and proportions of verification for patients with positive and negative test results influence the accuracy of a new diagnostic test. If a new index test for a very rare disease is evaluated, the PV method should be used for assessing the performance of the index test. When a disease prevalence is >1%, the DV method will result in a less biased and more precise estimate of diagnostic accuracy of an index test, if the BS test itself used in the DV method has large specificity and specificity. One concern of using BS test for the DV method is the clinical cost. Depending on the disease type, the BS tests usually are imperfect, but may be less aggressive and/or less expensive than the gold standard test. Moreover, as all clinical examinations require professional personnel to perform, verification of the index test for relative large proportion of a large cohort of patients could become a burden on human resources. Thus, the future research of the optimal design method for a diagnostic accuracy study should be based on the comprehensive cost-effectiveness analysis.

2453

Serious cardiovascular morbidity and mortality in a cohort of adults with Fontan physiology

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OBJECTIVES/SPECIFIC AIMS: The morbidity and mortality in adults with single ventricular hearts who have undergone Fontan palliation is poorly defined. These patients have a high burden of arrhythmia, heart failure, and re-operation. We hypothesized that age and type of Fontan predict occurrence of arrhythmia. **METHODS/STUDY POPULATION:** In total, 205 patients aged 18 years who had undergone a Fontan procedure were identified. Those with incomplete data were excluded. Demographic, anatomic, pharmacologic, imaging, hemodynamic, and electrophysiologic data were collected. The χ^2 and Mann-Whitney *U* tests were used to test significance defined as $p < 0.05$. **RESULTS/ANTICIPATED RESULTS:** Of the 205 patients identified, 59 had been lost to follow-up. Of the 146 patients (77, 53% female) actively followed 18 (12%) had died at a median (IQR) age of 27 (21–34.3); in patients alive as of 10/2016 the median age was 26 years (22–34). Fontan types were lateral tunnel (LT) ($n = 79$, 54.1%), extracardiac (EC) ($n = 32$, 22%), right atrial to pulmonary artery (RV-PA) ($n = 28$, 19%), and Fontan with Bjork modification ($n = 4$, 2.7%). Systemic left ventricle ($n = 96$, 66%) was more common than systemic right ventricle ($n = 43$, 30%). Of the 146 patients, 101 (69%) had significant morbidity or mortality: 86 (59%) were diagnosed with arrhythmia, 18 (12%) died, and 11 (8%) underwent heart transplants. Frequent procedures included: Fontan revisions/cryoablation in 28 (19%), electrophysiology studies with ablation in 73 (50%), and pacemakers in 53 (36%). Of the arrhythmia diagnoses, 57 (64%) were atrial tachyarrhythmias. RV-PA Fontan procedures were associated with significantly more atrial arrhythmia than all other Fontan types (70% vs. 30%; $p < 0.01$). There was no statistical difference in occurrence of atrial arrhythmia in adults with LT Versus EC Fontans ($p = 0.3$). While patients who had undergone RV-PA and Bjork Fontans were older with median age 34 years, there was no significant difference in age between LT and EC (median 24.0 and 24.5). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Adult survivors of the Fontan procedure suffer from significant morbidity and mortality. The single most prevalent morbidity is atrial arrhythmia. We conclude that RV-PA Fontans, now obsolete, have the highest prevalence of arrhythmia and that there is no difference in arrhythmia burden between LT and EC Fontans. Given the high prevalence of morbidity and mortality in this population, it is imperative that they be followed by cardiologists with expertise in congenital heart disease.

2464

Phenotypic characteristics of pediatric nonalcoholic fatty liver disease

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OBJECTIVES/SPECIFIC AIMS: The purpose of this study is to characterize children with nonalcoholic fatty liver disease (NAFLD) living in the Southeastern United States. **METHODS/STUDY POPULATION:** This retrospective electronic medical record chart review was conducted on a random sample of 206 children identified with NAFLD. Patients were included if they met the following criteria:

confirmed NAFLD through either an ultrasound or liver biopsy or clinical suspicion of fatty liver disease alongside elevated alanine aminotransferase (ALT) in the absence of other etiologies causing elevated transaminases. Patients were excluded if they had hepatitis or other documented liver disease. Data collected at initial presentation included age, gender, ethnicity, height, weight, body mass index (BMI), BMI percentile, blood pressure, HbA1c, aspartate aminotransferase (AST), ALT, γ -glutamyl transferase (GGT), total cholesterol, total triglycerides, low-density lipoprotein, and high-density lipoprotein. Statistical analysis: for descriptive statistics, frequency counts and percentages alongside means, standard deviation, range, min/max values for the continuous variables were calculated. **RESULTS/ANTICIPATED RESULTS:** This study included 206 children diagnosed with NAFLD. Subjects were primarily male ($n = 136$, 66%) and Caucasian ($n = 133$, 66%), followed by Hispanic ($n = 42$, 21%), Black ($n = 25$, 12%), and Asian ($n = 2$, 1%). Mean age at diagnosis was 12.3 ± 3.5 years. Mean weight (lbs), height (in), and BMI (kg/m^2) of subjects at diagnosis were 192 ± 77 lbs, 61.7 ± 6.6 in, 34.6 ± 9.7 kg/m^2 , respectively. Patients had an average systolic blood pressure of 124 ± 15.4 mmHg and diastolic blood pressure of 69.6 ± 10.6 mmHg. Mean ALT was 91.8 ± 67.2 U/L, AST was 61 ± 38.8 U/L, and GGT was 55.1 ± 64.6 U/L. Mean HbA1c was $5.8 \pm 1.4\%$, cholesterol was 176 ± 36.3 mg/dL, triglycerides were 200 ± 134 mg/dL, low-density lipoprotein was 107.6 ± 32.1 mg/dL, and high-density lipoprotein was 39.9 ± 8.4 mg/dL. **DISCUSSION/SIGNIFICANCE OF IMPACT:** In addition to having significantly elevated liver enzymes, children with NAFLD had several derangements in their metabolic profile, most notably high triglyceride levels and HbA1c values in the prediabetic range. Although lifestyle modification is the gold standard treatment for NAFLD, pharmacotherapy may need to be included to address metabolic syndrome.

2472

Subjective cognitive complaints in mild traumatic brain injury and 6-month return to work prediction: A TRACK-TBI Study

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OBJECTIVES/SPECIFIC AIMS: About 75% of the estimated 2.5 million traumatic brain injuries (TBIs) diagnosed annually classify as mild TBI (mTBI); yet cognitive impairments associated with poor patient outcomes can persist for weeks to years. mTBI symptoms are difficult to measure objectively and often remain undiagnosed in the context of an unknown cognitive baseline. Formal neuropsychological exams hold limited utility due to their extensive resource burden. We aimed to define the clinical importance of a 4-question assessment of subjective cognitive complaints (SCC) in predicting return to work at 6 months following mTBI. **METHODS/STUDY POPULATION:** mTBI participants from the prospective Transforming Research and Clinical Knowledge in Traumatic Brain Injury Pilot Study were included. A self-report affirmation to at least 1 of 4 subjective cognitive symptoms yielded positive SCC. Regression analysis was used to determine factors associated with return to work by 6-months. **RESULTS/ANTICIPATED RESULTS:** Of 479 enrolled participants with mTBI, 271 (57%) had complete follow-up data. Of which, 156 (58%) had at least sheltered employment at enrollment. Thirty-four (22%) of workers had no return to work at 6-months. Demographics, prior education, presenting injury severity, work status, and post-traumatic stress disorder were associated with return to work. SCC was associated with lower odds of return to work by 6-months (OR = 0.11, $p = 0.01$). **DISCUSSION/SIGNIFICANCE OF IMPACT:** We suggest a concise 4-question assessment of SCC may be clinically relevant in estimating the likelihood of return to work by 6 months post-mTBI.

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