pedaling therapy device. METHODS/STUDY POPULATION: This work uses a robotic split-crank pedaling device to facilitate rehabilitation of interlimb coordination, measured by continuous relative phase (CRP) and paretic neuromuscular output. The effects of three control schemes were tested: assist, resist, and assist+resist. Each limb was strapped to a pedal which was connected to a motor. The participants were asked to pedal forward while keeping the pedals antiphase. The robot aided or resisted according to the activated control scheme. Control schemes were tested on two stroke participants. The control schemes respond proportionally to phasing deviation from 180 degrees. The assist scheme assisted the lagging limb while the resist scheme resisted the leading limb. The assist+resist did both control actions. RESULTS/ANTICIPATED RESULTS: For the assist scheme, CRP improved for participant 1 (P1) and declined for participant 2 (P2). P1 increased paretic velocity while P2 decreased. Rectus Femoris (RF) and Biceps Femoris (BF) activity of both limbs lowered for P1. RF and BF activity of both limbs remained about the same but shifted for P2. For the resist scheme, CRP improved for P1 and declined for P2. P1 increased paretic velocity while P2 decreased. P1 increased BF activity of both limbs while RF activity remained constant. P2 increased paretic BF activity and non-paretic RF activity. For the assist+resist scheme, CRP improved for both participants. Both participants increased paretic velocity. P1 increased paretic BF activity and decreased RF activity. P2 better modulated paretic BF and RF. DISCUSSION/SIGNIFICANCE OF FINDINGS: All control schemes augmented performance, however the assist+resist scheme showed the most promise in terms of CRP and muscle activity. More participants are needed to determine true effects of each control scheme. The control scheme selected will be the foundation for further improvements such as adaptive control and extrinsic feedback.

76644

Cognitive and Behavioral Outcomes in Adolescents with Sickle Cell Disease Before and After a Telehealth Cognitive Remediation Program to Prepare for Transition of Care

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ABSTRACT IMPACT: This study is providing a telehealth intervention for the first time in patients with sickle cell disease with the goal of improving cognitive functioning and preparing adolescents for successful transition of care to adult healthcare providers. OBJECTIVES/GOALS: There is a high prevalence of cognitive impairment in adolescents with sickle cell disease (SCD). The purpose of this study is to test the efficacy of an individualized cognitive remediation program designed to promote not just cognitive function, but also adaptive and self-management skills necessary for successful transition to independence. METHODS/STUDY POPULATION: 12 participants with SCD (5 males, ages 10-16) participated in an individualized program, Cognitive-Remediation of Executive and Adaptive Deficits in Youth [C-READY], consisting of three main components: individual goal-based therapy, parent training sessions, and home skill practice. C-READY sessions occur one-on-one with a trained therapist for 8 sessions conducted over 4 weeks. Weekly parent training sessions are also conducted as part of the C-READY program. All of these sessions occurred via telehealth video-calling between the therapist and the adolescent/parent. Participants were evaluated before and after the C-READY program using neuropsychological assessment measures and transition readiness questionnaires. Parents also completed ratings on telehealth delivery, content, and timing. RESULTS/ANTICIPATED RESULTS: Repeated measures ANOVA indicated significant improvement in transition readiness behaviors as rated by parents, including improved independence in medication management ($p = 0.029$) and in talking with their healthcare providers ($p = 0.019$). Significant improvement was also demonstrated on a neuropsychological measure related to executive function skills, specifically inhibition and switching ($p = 0.012$). Results from telehealth surveys (rated on a 5-point Likert scale) indicated overall satisfaction with services (4.2/5), including visual (4/5) and voice quality (4.3/5) of telehealth equipment. Ratings also indicated feeling that their privacy was respected (4/5) and that their interactions with their therapist were appropriate and sensitive (4.5/5). DISCUSSION/SIGNIFICANCE OF FINDINGS: These results provide support for interventions that focus on cognitive skills to improve behaviors necessary for successful transition of care in youth with SCD. Results are also promising for delivery via telehealth in order to address barriers related to access to care. Future results will continue to be reported, as this study is currently ongoing.

77523

Prospective cohort study of predominantly immigrant people with chronic hepatitis B in the Baltimore-metropolitan Washington D.C. area

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ABSTRACT IMPACT: Building a patient cohort to support clinical-translational research in chronic hepatitis B OBJECTIVES/GOALS: The overall objective of my KL2 project is to delineate the effect of HIV coinfection, and CHB disease stage and hepatitis B (HBV) viremia on the ability of toll-like receptor 8 agonism to restore HBV-specific immune cell function. This abstract describes the characteristics of the cohort from which research blood samples for my KL2 are collected. METHODS/STUDY POPULATION: HOPE is a prospective cohort study enrolling people with CHB including HIV/CHB coinfection, and resolved CHB. Participants are enrolled at primary care clinics in Maryland, Washington D.C., and Virginia. Standard-of-care antiviral treatment with tenofovir alafenamide (TAF) is prescribed through the study if indicated. Patients receiving TAF from the study are either starting treatment, or switching to TAF from another antiviral medication. If receiving TAF, participants are seen every 3-6 months for medication refills, clinical and research blood draws, and adverse event evaluations. Liver fibrosis is measured by FibroScan and a minority undergo liver biopsy. RESULTS/ANTICIPATED RESULTS: So far, 204 people have been enrolled, 177 with CHB (23 HIV/CHB coinfection), and 22 with resolved HBV infection. To date, 45 patients who were viremic at baseline and initiated on TAF have been enrolled. CHB predominantly affects Asian and African immigrants in the U.S, and the majority (77%) of HOPE participants are immigrants from these countries. The majority are male (70%), mean age 51 years (SD ±14). So far, 86 people with CHB monoinfection have been prescribed TAF on-study.

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Thirty-five percent of these had significant (>F2) liver fibrosis at baseline and half had elevated ALT (mean 47.5, SD ±55 IU/ml). Forty-three percent switched to TAF from another oral antiviral. Most switched due to lack of coverage by health insurance. DISCUSSION/SIGNIFICANCE OF FINDINGS: HOPE is a CHB cohort dedicated to collecting research samples and providing antiviral treatment. It is the foundation for the CHB translational research program at the University of Maryland School of Medicine. The availability of paired viremic and virally suppressed, HIV/CHB, and resolved HBV research samples are strengths of HOPE.

Data Science/Biostatistics/Informatics

17547

Transitions of Care among Patients with Diabetes in the Deep South: Factors Associated with Hospital Readmissions

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ABSTRACT IMPACT: Because diabetes disproportionately affects residents in the Deep South, identifying factors increasing the risk of hospital readmissions unique to this population can translate to tailored interventions and strategies to improve transitions of care and patients' health outcomes. OBJECTIVES/GOALS: Patients with diabetes (PWD) are susceptible to hospital readmissions due to inadequate transitions of care (TOC). To better understand how to improve TOC, the objective of the study is to identify factors associated with readmissions among PWD in Alabama disproportionally affected by diabetes. METHODS/STUDY POPULATION: This retrospective cohort study utilizes electronic health record data from an urban health system in Alabama. The study population includes adults (≥18 years old) diagnosed with diabetes who were hospitalized between 2016 and 2020. Women who are pregnant during hospitalization or diagnosed with gestational diabetes are excluded. Patient's index hospitalization is identified with a 3-month washout period preceding admission. The primary outcome is all-cause 30-day readmission. Characteristics are compared between patients with and without readmissions. Factors significantly associated with readmissions are identified with multiple logistic regression, adjusted for potential confounders. RESULTS/ANTICIPATED RESULTS: The sample size is expected to be around 30,000 individual PWD. Anticipated results include estimation of the all-cause 30-day readmission rate experienced by the PWD in Alabama. It is expected that various factors will be associated with either higher or lower odds of readmission, interpreted via odds ratios and 95% confidence intervals. Factors investigated are driven by previously identified risk factors of readmission from the literature, including but not limited to sociodemographic variables, lab values (A1C, glucose, serum albumin, serum sodium, etc.), vital signs (blood pressure), comorbidities, medications, length of stay, insurance coverage, geographic location, and social history. DISCUSSION/SIGNIFICANCE OF FINDINGS: Findings will establish evidence-based knowledge about TOC for PWD in the Deep South, specifically Alabama. Identifying factors associated with readmissions among PWD in Alabama will inform TOC intervention studies tailored to populations in the Deep South to effectively mitigate readmissions.

22566

Identifying metabolic mechanisms linking prenatal acetaminophen exposure to childhood attention-deficit hyperactivity disorder*

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ABSTRACT IMPACT: This study has implications for understanding early developmental mechanisms of ADHD and for guidelines regarding safe use of acetaminophen during pregnancy. OBJECTIVES/GOALS: Prenatal acetaminophen exposure has been associated with childhood attention-deficit hyperactivity disorder (ADHD), but the underlying mechanism is unknown. This prospective birth cohort study aims to identify linkages between specific metabolites in umbilical cord plasma and the association of prenatal acetaminophen exposure and ADHD. METHODS/STUDY POPULATION: The sample was a subset of the Boston Birth Cohort that included 583 mother-newborn dyads followed at Boston Medical Center from 1998 to 2018. Metabolites were measured from cord plasma collected at birth. Based on existing literature, the analyses focused on candidate metabolites involved in neuroendocrine, inflammation, and oxidative stress pathways. The outcome was physician-diagnosed ADHD between the ages of 3 and 16 years. Exploratory analyses and multiple logistic regressions were used to examine the association of these candidate metabolites with both unmetabolized cord plasma acetaminophen levels and with incident risk of ADHD, adjusting for covariates of maternal and child characteristics. RESULTS/ANTICIPATED RESULTS: Of the 583 children, 257 had ADHD and 326 had neurotypical development. Two promising results have been found thus far. 5-methoxytryptophol (5-MTX), a neuroendocrine molecule which also has antioxidant and immunomodulatory properties, was inversely associated with acetaminophen and ADHD risk. For children below the median cord 5-MTX level, the odds of ADHD were 3.29 (95% CI [1.56, 7.16], p=0.002) for the third tertile of acetaminophen compared to the first tertile. This association attenuated among those above the median 5-MTX level: 2.23 (95% CI [0.98, 5.21], p=0.059), suggesting a protective effect. Tryptophan, an essential amino acid and precursor of serotonin, was positively associated with acetaminophen and ADHD. Next steps include mediation analysis with tryptophan and analyses for other metabolites. DISCUSSION/SIGNIFICANCE OF FINDINGS: This study identifies cord plasma metabolites as possible modifiers or mediators linking prenatal acetaminophen exposure and childhood ADHD, which may offer insight into a mechanistic pathway. The study findings have implications for FDA, clinical, and public health guidelines regarding safe use of acetaminophen during pregnancy.

28201

A cross-sectional study of dietary patterns and nutrient intakes in the oldest old*

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ABSTRACT IMPACT: Understanding dietary patterns and nutrient intakes of the aging population may help address concerns and

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