ANTICIPATED RESULTS: Fifty percent of the CKD patients (n = 4) were female; 63% (n = 5) were white, and 37% (n = 3) were black. On average, participants were aged 56.6 ± 13.8 y with a BMI of 31.7 ± 9.4 kg/m^2 and eGFR of 40.7 ± 7.9 mL/min. Based on actual food intake, average Na intake on day 7 was 2024 ± 388 mg. Average measured 24hUNa was 2529 ± 1334 mg. The main ANOVA was significant ($p = 0.02$). Results from the planned contrasts found that e24hUNa from the SALTED cohort, an equation developed specifically for CKD patients, was significantly higher than both Na intake ($p<0.001$) and measured 24hUNa ($p = 0.007$). For the remaining 5 equations, e24hUNa was not significantly different from measured 24hUNa nor dietary Na intake. DISCUSSION/SIGNIFICANCE OF IMPACT : Our results suggest that e24hUNa calculated using most published equations may provide a reliable and low-burden method of assessing dietary Na intake in moderate CKD patients. These findings should be confirmed in larger samples. Additional studies are needed to validate or dispute the use of the SALTED equation for estimating Na intake.

Commercialization/Entrepreneurship

4273

An innovative rib construct for treatment of pediatric spinal deformity

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OBJECTIVES/GOALS: The rib construct is a novel device for treating childhood hyperkyphosis and kyphoscoliosis. The purpose of this study was to investigate the biomechanics, mechanism, and clinical outcomes of this device. The overarching hypothesis was that the rib construct is safe and effective for correcting hyperkyphotic spinal deformity. METHODS/STUDY POPULATION: **Biomechanical evaluation:** An *ex vivo* porcine spine biomechanical study compared traditional pedicle screw proximal fixation to the rib construct in terms of proximal fixation strength and construct stiffness. **Porcine model hyperkyphosis correction with rib construct:** An *in vivo* hyperkyphotic porcine model was used to study the ability of the rib construct to correct hyperkyphosis in the developing porcine spine. **Human hyperkyphotic correction with rib construct:** A retrospective study was conducted to examine the radiographic outcomes, complication rates, procedure times, and blood losses experienced by human patients that received rib construct surgery. RESULTS/ANTICIPATED RESULTS: **Biomechanical evaluation:** The rib construct was significantly less prone to proximal fixation failure and less stiff compared to pedicle screws. **Porcine model hyperkyphosis correction with rib construct:** The average T6-T14 thoracic kyphosis was 35.8 ± 3.2° at the time of hyperkyphosis creation surgery. In response to corrective surgery with the rib-hook construct, T6-T14 thoracic hyperkyphosis decreased immediately post-op to 11.3 ± 7.8° and continued to decrease to 7.8 ± 7.6° until final follow-up 8 weeks post-op (n = 3). **Human hyperkyphosis correction with rib construct:** Pre-op sagittal Cobb angle was 81 ± 31° and fell to 43 ± 24° post-op and to 38 ± 24° at final follow-up; indicating ~100% correction (normal thoracic kyphosis is 40°). DISCUSSION/SIGNIFICANCE OF IMPACT: The results suggest that the rib construct is a highly effective technique and superior to existing methods.

4393

Translational Characterization of Blood Pressure Changes Following the DASH Diet– from Nutrition to Electrolytes to Exosomes

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OBJECTIVES/GOALS:

1. analyze urinary protein exosome content pattern before and during DASH diet.
2. characterize urine electrolyte changes associated with changes in protein profiles, and hormonal changes before/after DASH diet.
3. analyze the association of these changes to the DASH-related BP response.

METHODS/STUDY POPULATION: In this proof of concept study, hypertension stage 1 volunteers will receive a DASH based menu during 14 consecutive days of elective admission to the RU research hospital. Participants will complete a food frequency questionnaire (VioScreen) with a bionutritionist. Throughout the intervention period, participants will be assessed for blood pressure, plasma renin and aldosterone, and 24 hour urines for electrolytes, creatinine, protein, albumin and first morning urine collected for exosomes. Exosome analysis will be performed by a commercial lab. Proteome analysis will be conducted in the RU Mass-spectrometry service. RESULTS/ANTICIPATED RESULTS: The causal pathway we will elucidate hypothesizes that: 1) changes in diet affect blood electrolytes, and through these, aldosterone. 2) Aldosterone alters the expression of specific transporter proteins in the renal tubule; protein expression will be reflected in the urine exosome. 3) These transporters affect the excretion of electrolytes, as reflected by urinary ratio of sodium (Na) to Potassium (K). During consumption of the Western diet, the Na/K ratio is approximately 2-2.5, whereas we expect the urinary sodium/potassium ratio to be <1, when the participant is eating a DASH based diet. DISCUSSION/SIGNIFICANCE OF IMPACT: This assay provides a clinical tool to assess dietary adherence, and the project will provide insights into the mechanism whereby DASH reduces blood pressure.

4038

Development of a Catheter Stabilization Device for Stent Placement Aid

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OBJECTIVES/GOALS: Precisely, the goal of the device is to initiate a friction force between the delivery system and the arterial vessel wall to both assure immediate stent deployment and prevent axial advancement of the stent-anchoring wire. METHODS/STUDY POPULATION: A prototype was constructed and its effectiveness of applying a friction force to a vessel wall was tested ex vivo using an LRX Plus Materials Testing Machine. Afterwards, the experimental performance of the device was compared to that of a finite element simulated model. RESULTS/ANTICIPATED RESULTS: The device demonstrated the ability to apply a friction force to the vessel wall to meet its objective. However, experimental values were consistently greater than those gathered from the simulation. Since the force prescribed by the device is minimal, future work includes increasing the

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force capabilities of the device and defining force requirements. DISCUSSION/SIGNIFICANCE OF IMPACT: Upon further development and testing, this device can be implemented into endovascular neurosurgery to improve occlusion rates of intracranial aneurysms and reduce patient risk during these operations. CONFLICT OF INTEREST DESCRIPTION: I am pursuing intellectual property on this invention. I was careful not to describe the invention in too much detail in my abstract submission for this reason. This research is my thesis work, and I placed on one year embargo on it before it is published to give us time to sort out IP. I would like to be considered for inclusion in Translational Science 2020 if I am able to get IP on this work before publishing, which I expect will be the case. I have every intention of obtaining IP before the conference in April 2020.

4524

Fighting Malaria, One Image at a Time: Using Computer Vision to Develop an Automated Vector Speciation Tool

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OBJECTIVES/GOALS: Rapid and accurate identification of primary malaria vector species from collected specimens is the most critical aspect of effective vector surveillance and control. This interdisciplinary team of engineers aims to automate identification using a deep learning computer vision algorithm. METHODS/STUDY POPULATION: The team spent August of 2019 observing and participating in control and surveillance activities in Zambia and Uganda. They conducted >65 interviews with key stakeholders across 9 malaria control and surveillance sites, ranging from field and community health workers, to malaria researchers and Ministry of Health employees. Stakeholder feedback validated the need for a more accurate and efficient method of vector identification in order to more effectively deploy targeted malaria interventions. The team set forth in designing and prototyping a portable, automated field tool that could speciate mosquito vectors to the complex level using artificial intelligence. RESULTS/ANTICIPATED RESULTS: The team's research demonstrated that accuracy, cost effectiveness, and ease of use would be critical to the successful adoption of the tool. Results of initial prototyping, usability studies, and stakeholder surveys were used to determine the tool's minimal user specifications: 1) the ability to distinguish between *Anopheles Gambiae* and *Anopheles Funestus*, the two principal malaria vectors in the countries visited, 2) achieving an identification accuracy of ≥90% to the complex level, and 3) accessibility to the speciation data 3-7 days following vector collection. Next steps include optimizing the tool to deploy a minimal viable product for testing in Kenya by the summer of 2020. DISCUSSION/SIGNIFICANCE OF IMPACT: The accurate, high-quality surveillance enabled by this device would allow malaria control programs to scale surveillance to remote regions where an entomologist may not be available, allowing malaria programs to deploy effective interventions, monitor results, and prevent disease.

4294

Patient Matching Errors and Associated Safety Events

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OBJECTIVES/GOALS: Errors in patient matching could result in serious adverse safety events. Unlike publicized mix-ups by healthcare providers these errors are insidious and with increased data sharing, this is a growing concern in healthcare. The following project will examine patient matching errors and quantify their association with safety. METHODS/STUDY POPULATION: EHR systems perform matching out-of-the-box with unknown quality. Using matching processes outside the EMR, the rate at which matching errors are present was quantified and the erroneous records were flagged providing both comparative measures and data necessary to evaluate patient safety. To understand the relationship between matching and safety we will establish a percent of voluntarily reported safety events in our institution where a matching error existed during an encounter. Any safety events occurring for a flagged patient will be reviewed to determine if matching errors contributed to the safety problem. Not all safety events are reported so we will perform full chart review of a filtered list of medical records that have a higher likelihood of safety events. RESULTS/ANTICIPATED RESULTS: We were able to quantify matching errors, and the preliminary matching error rate is approximately 1%, representing over 700 patients. The work is in progress and we are beginning to determine the association between safety events and incorrect matching. Together these results will provide an incentive to identify errors, make corrections, and develop methods to achieve these objectives. The number of matching errors impacts patient care as well as business operations and is likely to have a negative financial impact on institutions with high error rates regardless of its relationship to safety. DISCUSSION/SIGNIFICANCE OF IMPACT: Patient matching is bundled with EHR software and institutions have little control over error rates, yet bear the liability for resulting clinical error. Institutions need to be able to identify undetected matching errors and any associated safety events and this project will provide that solution.

4324

Phase 1 Sterile Product Formulation and Manufacturing at Academic Medical Centers: An Introduction for Translational Researchers

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OBJECTIVES/GOALS: To facilitate the development of innovative injection products by providing translational researchers with a regulatory and manufacturing road map for producing small batch sterile products for Phase 1 research use. To leverage recent AMC investments in facility improvements and pharmacy training in the areas of sterile product production, testing, and environmental controls, that can be used to support production of phase 1 clinical trial supplies METHODS/STUDY POPULATION: Searching and organizing relevant data and information from web portals and databases in the following: areas: FDA, EMA, USP regulations, regulatory

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