parameters, and established high-grade molecular features. We will use supervised learning techniques to develop algorithms for predicting molecular features from imaging phenotypes. RESULTS/ANTICIPATED RESULTS: Anticipated results - advancements in understanding the molecular biomarkers of meningiomas has uncovered genetic alterations and epigenetic changes that more accurately determine tumor behavior. Currently, the imaging correlates of these molecular biomarkers are unknown, and utilizing radiographic data to predict prognosis and imaging-based classifications of meningiomas have not yet been investigated. Validated imaging correlates of molecular biomarkers not only provide an in-vivo assessment of tumor biology, but can also be integrated with histopathologic features (radiopathomics models') for more accurate disease prognostication. We anticipate that our results will identify surrogate imaging features for some of the recently emerged molecular biomarkers of meningioma. DISCUSSION/SIGNIFICANCE: There is a paucity of data on the importance of imaging phenotypes in determining tumor biology. This work has the potential of significant clinical impact by enabling a priori molecular characterization of meningiomas at the time of new diagnosis or recurrence, thereby allowing a personalized medicine approach to treatment planning.

328

Rapid Screening Tool for Identifying Acute Myocardial Injury: An Exploratory Study Evaluating the Ability of a Novel, Noninvasive Device to Detect Cardiac Troponin

Sam McDonald[1], Jessie Katz[2], Jitto Titus[2], Siddharth Biswal[2], Atandra Burman[2], Kartik Agusala[3], Deborah Diercks[3], Rebecca Vigen[3]
[1]UT Southwestern [2](RCE) [3](UTSW)

OBJECTIVES/GOALS: Tropsensor, a noninvasive portable device using infrared spectroscopy, delivers a troponin res ult within five minutes, significantly quicker than standard of care (SOC) assays. This pilot study assesses the correlation of the Tropsensor and high sensitivity cardiac troponin (hs-cTnI) assay results. METHODS/STUDY POPULATION: Patients undergoing cTnI testing with the Abbott Architect STAT (Abbott Laboratories) hs-cTnI assay were recruited at a quaternary-care emergency department (ED). The Tropsensor was applied to the underside of the patients' wrist within 5 minutes of the SOC blood draw for 5 minutes. The results of the hs-cTnI assays were compared with the raw output of the Tropsensor device to assess the relationship using both Spearman's and nonlinear logarithmic measures of correlation. Patient demographic data was extracted from the EHR to supplement the data collected for this study. RESULTS/ANTICIPATED RESULTS: 58 patients were recruited with a mean age of 60 years (60% male, 40% female). Due to connection error, 8 patients'data did not get captured by the device. Additionally, due to noise related to suboptimal device contact with the wrist, 24 patients'data (41%) were rejected. Of the 26 patients with usable data, 9 patients had a troponin above the 99th percentile threshold. A nonlinear correlation of 0.64 and Spearman's rho of 0.59 were observed between the SOC hs-cTnI assay and Tropsensor optical data. DISCUSSION/SIGNIFICANCE: The Tropsensor exhibits 64.4% correlation to the SOC hs-cTnI assay. While further evaluation is needed, this exploratory study provides insight into the potential of a transdermal optical device to be used as a screening tool for AMI in an ED triage situation.

330

Remote Monitoring of Pediatric Heart Failure: A Systematic Review

Saisamhitha Dasari[1], Bhavya Gopinath[1], Carter Gaulke[2], Sunny Patel[3]
[1]BS from Rice University, Candidate in MSE from Johns Hopkins University [2]B.S in Mechanical Engineering from St. Thomas University and Candidate in M.S Bioengineering Innovation and Design from Johns Hopkins University [3]B.S in Biophysics and Candidate in M.S Bioengineering Innovation and Design from Johns Hopkins University

OBJECTIVES/GOALS: Pediatric heart failure is a complex disease presenting as an end-stage condition due to various etiologies and symptoms, causing 14,000 hospitalizations per year in the United States. Currently, there is a lack of objective metrics that are monitored non-invasively. This study explores tools to adapt remote monitoring technologies for pediatrics. METHODS/STUDY POPULATION: The task was determining commercially available and upcoming technologies for remote heart failure monitoring in the pediatric population. Literature and patent reviews were done in various databases with defined eligibility and key terms. Our inclusion criteria were: English peer-reviewed research or review articles, patents filed by cardiac monitoring companies, and independent groups focusing on non-invasive monitoring solutions. Key terms used for the literature search and patent review included pediatric heart failure', at-home monitoring', cardiac monitoring', and non-invasive'. Based on a strong correlation between increased filling pressures and pediatric heart failure, the term filling pressures' was also included in the search. RESULTS/ANTICIPATED RESULTS: Preliminary searches demonstrate an abundance of adult-use commercially available devices and patents for monitoring heart failure. Yet, there are no FDA-approved devices for use in the pediatric population. Current devices include monitoring metrics such as lung congestion and multi-parametric monitoring to capture heart rate, thoracic impedance, and oxygen saturation levels. In monitoring filling pressures, Abbott CardioMEMs is a leader in measuring pulmonary arterial pressure invasively in adults. Thus, there is a gap for non-invasive monitoring of filling pressures in both pediatric and adult populations. For further review, a larger focus will be placed on non-invasive methods for direct monitoring or extrapolation of cardiac filling pressures. DISCUSSION/SIGNIFICANCE: Current methods of heart failure monitoring are ineffective in serving the pediatric population. Thus, an identified gap exists in non-invasive filling pressure monitoring for pediatric heart failure. This review informs that innovation within this area would address inefficacies within the current paradigm of heart failure monitoring.

331

Reusing EHR Phenotyping Algorithms in Practice: Developing the Colorado Diabetes EHR Research Repository (CODER)

Melissa P. Wilson[1], David A. Mayer[1], Luke V. Rasmussen[2], Pramod Khanal[1], Maryam Nuriyeva[1], Michael McRae[1], Sridharan Raghavan[1], Laura K. Wiley[1]
[1]University of Colorado Anschutz Medical Campus [2]Northwestern University Feinberg School of Medicine

OBJECTIVES/GOALS: The rates of computational phenotyping algorithm reuse across health systems are low, leading to a

proliferation of algorithms for the same trait. We propose a framework for reusing computational phenotyping algorithms and describe the real-world deployment of this framework for the development of the Colorado Diabetes EHR Research Repository. METHODS/STUDY POPULATION: The novel phenotype reuse framework consists of 4 steps: select algorithms that are appropriate for reuse by assessing whether they are fit for purpose; extend the algorithm to account for changes in data and care practice standards; localize the algorithm to use local database standards and terminologies; optimize the algorithm by applying a data driven approach to achieve the desired local performance. To identify individuals with type 1 diabetes (T1D) or type 2 diabetes (T2D), we selected and implemented T2D algorithms in a cohort of adults with any diabetes or pre-diabetes related diagnosis code, medication, or abnormal glucose-related laboratory test in the clinical data warehouse for UCHealth and the University of Colorado. RESULTS/ANTICIPATED RESULTS: We included a total of 926,290 patients who were identified by initial filters. Patients were more likely to be female (53%), identify as non-Hispanic white (69%) and had a median age of 58 years (IQR: 41, 70). Implementation, extension, localization, & optimization through iterative chart review prioritized high sensitivity for all-cause diabetes and high specificity for T1D and T2D. Of the original cohort, 252,946 (27%) were identified by the all-cause diabetes algorithm. Of these 11,688 were identified as T1D and 135,588 as T2D. After optimization the all-cause diabetes algorithm had 88% sensitivity, 90% specificity, 74% positive predictive value (PPV), and 96% negative predictive value (NPV). Our algorithms for T1D and T2D had high specificity (100% and 99%, respectively) and PPV (100 and 96% respectively). DISCUSSION/SIGNIFICANCE: Developing computational phenotyping algorithms is expensive and time consuming, yet algorithm reuse is low due to a lack of practical approaches for reusing algorithms. We demonstrate application of a novel framework for algorithm reuse, yielding good alignment of algorithm performance with study goals for identifying individuals with diabetes.

332

Role of Kynurenine/Tryptophan Ratio in Kidney-Lung crosstalk in two porcine trauma-induced multi-organ injury models

Pragya Singh[1], Daniel Montemayor[1], Annapurna Pamreddy[1], Viktor Drel[1,2], HongPing Ye[1], Anthony Franzone[1], Yanyi Zang[3], Teryn Roberts[3], Kevin Chung[4], Andriy Batchinsky[3,4], Kumar Sharma[1,2]
[1]Center for Precision Medicine, University of Texas Health Science Center, San Antonio, Texas [2]Audie L. Murphy Memorial VA Hospital, South Texas Veterans Health Care System, San Antonio, TX, USA [3]Autonomous Reanimation and Evacuation (AREVA) research program, the Geneva Foundation, San Antonio, Texas, USA [4]Uniformed Services University of the Health Sciences, Bethesda, MD
Corresponding author: E-mail: sharmak3@uthscsa.edu

OBJECTIVES/GOALS: Multiple Organ Failure, often precipitated by Acute Lung Injury, is a life-threatening condition that causes death in military and civilian life. Furthermore, Acute Kidney Injury is very common, increasing morbidity and mortality rates. Therefore, understanding the molecular difference between survivors and non-survivors is urgently needed. METHODS/STUDY POPULATION: A 24-hour unilateral pulmonary contusion porcine model (pneumonectomy) of trauma-induced Multiple Organ Failure (MOF) model (n=17) and separate 48-hour polytrauma injury of bilateral pulmonary contusion, traumatic brain injury, and

hemorrhage (polytrauma) MOF model (n=26) was developed at Dr. Batchinsky's AREVA laboratory. Serum was assayed at baseline and 3h or 6h post-trauma for amino acid metabolites using the Zip-Chip platform for mass spectrometry. The IDO1 enzyme activity assay kit (ab235936) was used to measure IDO1 enzyme activity in the tissue. Mass Spectrometry Imaging (MSI) was employed to frozen kidney tissues. Tissues were sectioned to 10- micron thickness. For MSI, the DAN matrix was utilized, and MALDI-MSI images were processed and obtained from METASPACE and SCILS software. RESULTS/ANTICIPATED RESULTS: In the pneumonectomy model, 10 survived, 7 died, and in the polytrauma group, 13 survived, and 13 died. In the pneumonectomy model, there was a significant increase in the serum kynurenine/tryptophan (KYN/TRP) ratio in the non-survivors 3h post-injury. A similar pattern was found in the validation group, which showed a significant increase in the KYN/TRP ratio at 6h post-trauma in non-survivors from the polytrauma model. There was a significant increase in IDO1 enzyme activity in non-survivor kidney tissues and a downregulation of tryptophan (TRP) metabolite in the kidney section in the non-survivor group post-trauma. DISCUSSION/SIGNIFICANCE: An increase in the KYN/TRP ratio post-trauma identified the pigs that suffered early mortality. A decrease in TRP metabolite and an increase in IDO1 enzyme activity in the kidney could contribute to an increase in KYN in the non-survivors. As a result, focusing on therapeutics targeting the KYN/TRP to reduce the incidence and severity of MOF is warranted.

334

Determinants of Health Affecting Self-Efficacy and Quality of Life in Patients with Prostate Cancer*

Jada A. Ohene-Agyei[1], Jill Hamilton-Reeves[1], Juliana Teruel Camargo[2]
[1]University of Kansas Medical Center [2]NIH National Heart, Lung, and Blood Institute

OBJECTIVES/GOALS: Our long term goal is to identify the socioeconomic and cancer-specific determinants in patients with prostate cancer undergoing prostatectomy that impact their ability to maintain a healthy weight. This study explores the association between participants'health determinants and their indicated degree of self-efficacy and quality of life (QoL). METHODS/STUDY POPULATION: Study population includes participants of the WARRIOR trial (n=40), which included overweight men scheduled radical prostatectomy from the University of Kansas Medical Center. In addition to baseline demographics, the study team will administer a questionnaire based on a socioeconomic position and health-related QoL framework. This questionnaire will assess participants' socioeconomic, cancer-specific, and psychological circumstances at time of surgery and present day. Univariate analyses will be conducted on all variables with bivariate analyses between socioeconomic and clinical items to the outcome of composite self-efficacy scoring. RESULTS/ANTICIPATED RESULTS: We anticipate that participants in the intervention will report higher self-efficacy and emotional/social support than participants in the control group, participants with social vulnerability (lower income, marginalized race/ethnicity, etc) will report decreased self efficacy and poorer QoL compared with participants who are not socially vulnerable, and that participants who previously indicated social vulnerability will report more emotional barriers to weight loss, and lesser weight loss satisfaction, self-esteem, and QoL. DISCUSSION/SIGNIFICANCE: Lifestyle interventions have helped prostate cancer patients lose