

Posters 1–49 are the top 50 posters

Biostatistics, Epidemiology, and Research Design

Projecting outcomes in respiratory technology-dependent children after serious illness (Project ORCAS)

Julia Heneghan¹, Elizabeth Marsh², Sisi Ma³, Samuel Goldfarb⁴, Scott Crow⁵ and Marie Steiner⁴

¹University of Minnesota; ²Family Voices of Minnesota; ³University of Minnesota, Institute for Health Informatics; ⁴University of Minnesota, Department of Pediatrics and ⁵University of Minnesota Department of Psychiatry

OBJECTIVES/GOALS: Children with chronic respiratory technology needs (CRTN) are becoming a dominant patient group in pediatric intensive care units (ICUs). However, little is known about patient-level, long-term outcomes in this population. The lack of such knowledge may lead to inadequate ICU therapies, interventions, or follow-up care. **METHODS/STUDY POPULATION:** This project will deploy a set of ecological momentary assessment (EMA) modules measuring real-time functioning as well as standardized instruments to measure child and family outcomes including health care utilization, physical functioning, and health-related quality of life following pediatric critical illness in children with CRTN. EMA has particular strength in assessing conditions where individual-level characteristics vary over time, as after critical illness. EMA's recurrent measurements allow for evaluation of the variables' temporal course and limit the potential for bias associated with recall surveys. Pulmonary function in children with CRTN in this study will be monitored over time using standardized pulmonary metrics and information from home respiratory machines. **RESULTS/ANTICIPATED RESULTS:** This work tests the central hypothesis that long-term functional outcomes in children with CRTN are predicted by multimodal data obtained during and shortly after critical illness. To date, 17 families (of a planned 70) have been enrolled. Adherence to EMA modules is high, with 80% completion. Following serial data collection at 3, 6, and 9 months after hospital discharge, phenotypes of recovery (including improvement, stability, or deterioration) will be described. This will include 1) describing the patient demographic and clinical features associated with each long-term outcome trajectory and 2) identifying subgroups with similar outcome trajectories using patient demographics, features of the clinical illness, and EMA data using both traditional biostatistical and causal analysis techniques. **DISCUSSION/SIGNIFICANCE OF IMPACT:** This project will provide important insights into the long-term outcomes following critical illness of children with CRTN while utilizing an innovative methodology. This proposal will provide the necessary information to drive future clinical trials assessing potential interventions at a number of different points to improve outcomes.

*Blue Ribbon Awardee; [†]Gold Ribbon Awardee

Contemporary Research Challenges

4

Modernizing clinical research: An administrative approach to unlocking the potential of decentralized clinical trials

Jerry Tribout, Heather Tribout, Kathryn DiFrancesco, Kylie Phillips and Shannon Swiatkowski

Case Western Reserve University

OBJECTIVES/GOALS: Decentralized clinical trials (DCTs) shift participation outside traditional sites. This poster explores innovative administrative strategies for incorporating decentralized elements, improving flexibility, access, and efficiency in clinical research. **METHODS/STUDY POPULATION:** Modern administrative approaches are crucial for unlocking DCT potential by streamlining logistics, enhancing participant experience, and ensuring regulatory compliance. Key innovations include expedited IRB Review: using innovative template language; innovative consent strategies – eConsent and remote/virtual and contactless enrollment; telehealth communications – Twilio (voice calls and text messages)/Zoom (virtual video visits); automated participant compensation and rideshare services – Greenphire ClinCard®; flexible data collection – automated recruitment/intake forms and research surveys – REDCap; mobile research unit/self-collection lab kits via mail. Implementing decentralization into your study unlocks the potential to rapidly recruit more diverse populations. **RESULTS/ANTICIPATED RESULTS:** The integration of decentralized elements into clinical trials holds significant potential for reducing participant burden, thereby improving recruitment, retention, and overall trial efficiency. However, the success of decentralized clinical trials relies heavily on the implementation of modern administrative approaches that streamline operations and maintain regulatory compliance. Together, these administrative advancements not only enhance the operational flexibility of decentralized trials but also support the inclusion of diverse populations by reducing geographical and logistical barriers. **DISCUSSION/SIGNIFICANCE OF IMPACT:** As decentralized clinical trials continue to evolve, the adoption and further innovation of modern administrative solutions will be essential in improving the overall efficiency and inclusivity of clinical research.

5

Aurora kinase inhibition synergizes with Fanconi anemia pathway defects to limit tumorigenesis[†]

Paymon Doorodian¹, Arvin Nagarajan¹, Barbara Burtneiss², Gary Kupfer² and Emily Stahl³

¹Georgetown University Lombardi Cancer Center, Washington DC, 20057; ²Yale University School of Medicine, New Haven CT, 06510 and ³Georgetown University

OBJECTIVES/GOALS: The Fanconi anemia (FA) pathway is responsible for faithful DNA damage repair. FA mutations are

common in multiple types of cancer, including HPV-negative head and neck cancers. We sought to identify synthetic lethal genes within this pathway to target treatment of FA-mutant tumors through siRNA- and chemical-compound-based screens. **METHODS/STUDY POPULATION:** First, we completed siRNA-based and chemical compound-based screening assays to identify gene targets that reduce patient derived Fanconi pathway mutant cell (FA-D2) viability compared to Fanconi pathway proficient cells (FA-D2 + FANCD2). Five aurora kinase (AURK) inhibitors from the compound screen were chosen for further evaluation. Cell lines were treated with AURK inhibitors or siRNA-based AURK knockdown to assess viability, proliferation, DNA repair, and cell cycle progression differences. Patient mutational, mRNA expression, and outcome data were accessed through The Cancer Genome Atlas (TCGA) portal and the Caris CODEai portal. We stratified patients by tumor AURKA and AURKB mRNA levels and assessed differences in patient survival, tumor grade, and DNA repair proficiency. **RESULTS/ANTICIPATED RESULTS:** In both screens, AURKA came up as a target to selectively reduce the growth of FA-D2 cells compared to FA-D2 + FANCD2 cells. All five AURK inhibitors identified showed selective growth inhibition (~50–75%) in FA-D2 cells at low nanomolar doses. We narrowed our selection to hesperadin, an AURKB-specific inhibitor, which showed the highest selectivity. siRNA knockdown of AURKA and AURKB decreased cell viability by 50% and 20%, respectively. Patients with FA-mutated tumors from the TCGA pan-cancer dataset had high AURKA (twofold) and AURKB (threefold) mRNA expression. AURKA and AURKB tumor mRNA expression was significantly associated with poor patient survival. Homologous recombination deficiency scores were increased ~5-fold (p < 0.001). **DISCUSSION/SIGNIFICANCE OF IMPACT:** We hypothesize that in FA-deficient backgrounds, loss of AURKA or AURKB leads to heightened genomic instability due to cell cycle dysregulation and accumulated DNA damage. Our findings warrant investigation of the therapeutic potential for AURK inhibitors, specifically hesperadin, in FA-mutant head and neck cancers.

6

Exploring data scraping on ClinicalTrials.gov to identify key variables to include in an EHR-based recruitment tool

Sydney Lash and Emily Pfaff

University of North Carolina at Chapel Hill

OBJECTIVES/GOALS: Failure to achieve recruitment goals results in termination of ~20% of clinical trials and delays >85% of trial timelines. We aim to develop an electronic health record (EHR)-based recruitment tool to ease identification of participants. We sought to determine whether criteria listed on clinicaltrials.gov could support selection of tool variables. **METHODS/STUDY POPULATION:** To inform the variables to include in the EHR-based recruitment tool, we data scraped clinicaltrials.gov to identify key inclusion and exclusion criteria common across a variety of diabetes clinical trials. We included actively recruiting or recently active phase 2 and 3 clinical trials of adults aged >18 years of age in the USA. We classified identified variables as clinically relevant or not and compared clinically relevant terms with inclusion and exclusion criteria (~20 variables) that were individually identified by three diabetes clinical trialists and two clinical research coordinators (CRCs).

RESULTS/ANTICIPATED RESULTS: We reviewed 203 clinical trials listed on clinicaltrials.gov. We identified 115 terms, 91 of which were clinically relevant. Three of 3 clinical trialists, 1 of 2 CRCs, and all trials listed age as a key variable. Consistent with data scraping, all trialists and CRCs identified glucose-lowering medications and kidney function as important criteria. Gender, ethnicity, and race were less commonly noted on clinicaltrials.gov and listed by 2 of 3 trialists and one CRC. Cardiovascular conditions (e.g., history of myocardial infarction), thyroid function tests, and contraceptive requirements were common criteria on clinicaltrials.gov, but only one trialist and one CRC identified these variables. Active infections (e.g., HIV) and c-peptide were not highlighted by trialists or CRCs but common on clinicaltrials.gov. **DISCUSSION/SIGNIFICANCE OF IMPACT:** An EHR-based recruitment tool may facilitate identification of trial participants, but identifying key variables to include is essential. We found that data scraping for variables on clinicaltrials.gov mostly aligned with expert opinion, suggesting that automating variable selection via extraction from clinicaltrials.gov may be acceptable.

Education, Career Development and Workforce Development

7

The UCLA Clinical and Translational Science Institute (CTSI) Inspired Workforce Development Pathway Programs

Laurie Shaker-Irwin, Noah Federman Anne and Skinner

University of California, Los Angeles

OBJECTIVES/GOALS: The UCLA Clinical and Translational Science Institute (CTSI) training programs have been optimized by clinical research experts since 2013. They inculcate an interest in clinical and translational research careers. The acquisition of new skillsets and early exposure to potential career opportunities often influence lifetime decision-making. **METHODS/STUDY POPULATION:** The first program, in 2013, was the CTSI Research Associates Program (CTSI-RAP), which exposes undergraduate students to clinical research opportunities. RAP students are now mentoring high school students in the Mentoring and Advocacy in Teaching Clinical and Health-Related Research (MATCH) program. The Fiat Lux seminar is a research course designed to allow freshman students to explore diverse interests. The Leveraging Amazing Undergraduates in Clinical Research at UCLA Health (LAUNCH) program continues the workforce development pipeline by recruiting and training recent graduates to enter clinical research study coordinator careers. Each of these programs has their own stellar track records in terms of high interest and satisfaction and are assessed by annual evaluations from stakeholders. **RESULTS/ANTICIPATED RESULTS:** CTSI-RAP is in its 11th year and a recent 10-year impact survey demonstrated the value of the program to students and their career decision-making especially those who are underserved and/or disadvantaged. The MATCH program arose from the interest of RAP students to mentor STEM high school students from local disadvantaged schools and is now in its 4th year across the state. The Fiat Lux freshman seminar began with a clinical research essentials emphasis, followed by an