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OBJECTIVES/GOALS: Alterations in the patterns of cerebrospinal fluid (CSF) have been proposed to play a role in the development of symptoms related to Chiari I malformation (CMI). We aim to use 4D MRI to evaluate CSF fluid dynamics in CMI, including CSF pressures and local flow vectors, and their association with pre- and post-operative symptoms. METHODS/STUDY POPULATION: Study Population: Pediatric and adult patients diagnosed with Chiari I malformation (caudal descent of cerebellar tonsils ≥ 5 mm below the foramen magnum) at Washington University in St. Louis. Methods: Patients underwent CSF 4D flow MRI studies on 3.0T MRI at Washington University in St. Louis. The acquired imaging data will be preprocessed to unwrap velocity aliasing, denoise, and account for MRI-associated eddy artifact. Flow visualization and quantification will be performed in order to calculate patient-specific flow patterns, such as flow vortices and bidirectional flow, and vectors, such as peak velocity, at CSF spaces of the brain and spine. Clinical data, including demographics, symptom history (e.g., headache), physical exam findings, and presence of syrinx have already been collected. RESULTS/ANTICIPATED RESULTS: We anticipate that patients with greater preoperative CSF flow heterogeneities and abnormalities of flow vectors will be associated with a higher likelihood of symptoms, and that patients with greater postoperative normalization of these variables will be more likely to experience symptom relief. DISCUSSION/SIGNIFICANCE OF IMPACT: The role of CSF hydrodynamics in CMI remains incompletely understood. We aim to examine whether alterations in CSF flow may explain why some patients are asymptomatic, while others suffer debilitating headaches and cranial nerve palsies. The results would expand scientific knowledge and may aid in identifying patients likely to benefit from surgery.

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Redesigning the quantitative membership survey and data collection methods to improve CTSA hub membership metrics

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OBJECTIVES/GOALS: Prompted by low survey response rates, the University of Cincinnati CTSA hub undertook a comprehensive redesign of our annual membership survey and methods. The objective is to describe our stepwise survey redesign process to increase participation and improve evaluation data quality. METHODS/STUDY POPULATION: As a first step, we updated the survey distribution list by removing all undeliverable and unsubscribed emails. Next, to provide a framework for revising survey items, we explicitly defined our evaluation questions: Who are our members; how often do they interact with the CCTST; how do they want to interact with the CCTST; what current resources or services are being used by our members; how do we reduce barriers to understanding what the CCTST offers & does? We prioritized survey items addressing ≥2 evaluation questions. Items were then categorized by membership role, constructs (e.g., awareness, improvement), and alignment with evaluation questions. Once the survey was finalized in the final form, the evaluation team presented the revised survey to the UC CTSA hub executive committee members for feedback. RESULTS/ANTICIPATED RESULTS: Over 1382 (24.7%) email addresses were removed from the distribution list (n = 1185 were invalid; n = 158 had not accessed their CCTST account in >10 years; n = 8 unsubscribed from the distribution email; n = 31 no email listed for member). Using the evaluation questions, we reduced the survey from 72 to 43 questions. In addition, time to complete the survey ranged between 01:30 and 36:00 with an average of 05:39. After improvements were made to the survey and methods, we sent the survey to 4,426 valid email addresses. Of those that received the survey, 132 completed the survey (response rate = 3%). DISCUSSION/SIGNIFICANCE OF IMPACT: Improvements aim to boost response rates, provide actionable insights, and guide CTSA hub governance and program development. Next, we will conduct qualitative focus groups with members in the spring to build on our quantitative results and provide in-depth insights regarding membership engagement.

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Methodological approach to evaluating impact

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OBJECTIVES/GOALS: The Dissemination, Implementation, and Continuous Quality Improvement (DICQI) team at the Wake Forest Clinical and Translational Science Institute (WF CTSI) has implemented the Translational Science Benefits Model (TSBM) to assess impact evaluation and drive excellence in translational science. METHODS/STUDY POPULATION: The DICQI team collaborated with the Work Force Development, Community & Stakeholder Research Engagement, and Pilot programs to implement TSBM questions into already established surveys and applications in an effort to reduce fatigue. Respondents select up to five benefits they anticipate their project impacting and provide a brief description of each. A follow-up survey is deployed at project completion to ask if the benefits were actually impacted, with space to add additional benefits if needed. The REDCap team assisted with the build, so the anticipated benefits automatically populate into the follow-up surveys, which are typically sent after one year but are project/program dependent. RESULTS/ANTICIPATED RESULTS: We

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anticipate that by including TSBM questions into established surveys and applications, survey burden will be low and response rate will be high. These data will be used to create impact profiles and case studies. A section of our CTSI website will be dedicated to these deliverables, we will disseminate them internally, and we will submit the most compelling ones to the TSBM website. Once we have enough TSBM data gathered, we will create dashboards to display a broad evaluation of our CTSI impact. We will also use the dashboards to identify gaps in our impact and adjust pilot funding to support projects that address such gaps. DISCUSSION/SIGNIFICANCE OF IMPACT: By keeping the TSBM questions brief, auto populating the follow-up survey with previous responses, and adding to existing surveys, we expect a high response rate leading to robust data for long-term evaluation, informed decision-making, and effective dissemination.

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Mapping the National Center for Advancing Translation Sciences (NCATS) translational science principles to Clinical and Translational Science Awards (CTSA) UM1 hub initiatives

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OBJECTIVES/GOALS: Apply the NCATS translational science principles as a framework to describe CTSA UM1 hub activities in terms of effective translational science approaches. Identify and characterize the distribution of principles across UM1-funded initiatives to support strategic management and reporting. METHODS/STUDY POPULATION: Hub-affiliated faculty and staff convened at an annual, in-person retreat for the Northwestern University Clinical and Translational Sciences (NUCATS) Institute. Module teams, including at least one co-lead from Workforce Development for Clinical Research Staff Professionals (C1), Community and Partner Engaged Research (C2), Resources and Services (D1), and Health Informatics (D3), completed a concept mapping exercise to identify which, if any, of the 7 translational science principles were exemplified by their initiatives. Teams worked collaboratively to map principles to each initiative. Data were aggregated at the module and hub levels. RESULTS/ANTICIPATED RESULTS: Each module reported 5–10 active, UM1-funded initiatives. Every initiative was mapped to>2 translational science principles, with 2 initiatives mapped to all 7 principles. On average, 4.6 principles were identified per initiative. "Focus on Unmet Needs" was the most highly reported across all initiatives. "Boundary-Crossing Partnerships," mapped to all Community and Partner Engaged Research (C2) projects, and "Creativity and Innovation" mapped to all resources and services (D1). 90% of Informatics (D3) initiatives were mapped to "Generalizable Solutions." Across the hub, "Bold and Rigorous Approaches" was the least likely to be identified. DISCUSSION/SIGNIFICANCE OF IMPACT: The translational science principles can be used to frame module-specific and hub-wide strengths and gaps. Concept mapping can be incorporated into project planning and reporting to increase shared understanding and alignment with the principles that support the translational science enterprise.

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Dyadic Health: The impact of daily health literacy utilization on parent and adolescent physical activity

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OBJECTIVES/GOALS: The current study seeks to evaluate daily health literacy utilization and self-efficacy as predictors of physical activity in adolescents and parents. METHODS/STUDY POPULATION: A 7-day ecological momentary assessment (EMA) study in which adolescent-parent dyads report baseline self-efficacy and health literacy utilization four times daily. Participants will also wear Fitbits continuously. RESULTS/ANTICIPATED RESULTS: We anticipate that higher daily health literacy utilization at the day-level will predict greater physical activity at the day level. Self-efficacy is expected to moderate these effects. Cross-dyad effects are also expected, such that one partner's higher daily health literacy utilization will predict improved health behaviors in the other. DISCUSSION/SIGNIFICANCE OF IMPACT: Findings will clarify how daily fluctuations in health literacy and self-efficacy influence individual and dyadic engagement in physical activity, informing the development of adaptive family-based interventions and precision health literacy promotion. OBJECTIVES/GOALS:

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Social emotional learning curriculum impacts on externalizing behaviors in elementary school: Effects moderation by race, ethnicity, and gender

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METHODS/STUDY POPULATION: We partnered with a local urban public school district to access school records for K5-5th grade students (N = 16, 528) in the district during the 2023–2024 school year. Students were matched to teachers and their SELC instruction records. Number of SELC lessons received over the school year was evaluated a predictor of discipline referrals and suspensions. Mixed effects zero-inflated negative binomial regression controlled for classroom- and school-level variation and the left-shifted distribution of disciplinary outcomes. Moderators were student race/ethnicity and gender. Covariates included age, economic disadvantage, special education status, days absent, and school characteristics including number of discipline referrals and suspensions per student and percent SELC completion. RESULTS/ANTICIPATED RESULTS: We found that the number of SELC lessons predicted significantly fewer referrals for chronic disruption ($\beta = -0.21$, $p < 0.001$). Referrals for disorderly conduct, fighting, and chronic disruption were most common. On average per student, there were 1.44 (SD 1.49) referrals, 0.28 (SD 0.53) suspensions, and students received 11 (SD 9) of 20 total SELC lessons over the school year. However, SELC was 90% less effective for African American

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