steps were completed in May 2022 and the team began to identify studies that could benefit from this collaboration. Given that all credentialing and access needs were in place, the team was able to initiate the study and complete all study requirements, from sample identification to data collection and clean up, in five weeks. DISCUSSION/SIGNIFICANCE: Workforce shortages of experienced clinical research coordinators make it imperative to overcome barriers presented by institutional rules in order to efficiently utilize available resources to conduct high quality research. The CTSAs provide the perfect opportunity for partner institutions to develop processes to allow support across sites.

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The Hatchery, a Universal Approach for Incubator Space in Academia

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OBJECTIVES/GOALS: The goal of the Hatchery is a new approach to de-risk innovative life science ideas within an entrepreneurial setting. The Hatchery creates value by vetting the initial potential through experimental testing. METHODS/STUDY POPULATION: In this study we took a functioning wet laboratory space that was vacant due to principle investigator movement, and created a pipeline for its use in life science startup formation. A functioning laboratory can remain unoccupied for a notable period with transitions of research leadership. At the same time, a life science startup company who is testing core principles of their technology need wet lab space at an affordable cost. Our solution called the Hatchery provides startup companies a state-of-the-art wet laboratory space, next to a research hospital, for a very short duration of time and minimal fee. This novel approach allows preliminary validation of a technology for initial NIH SBIRs and STTRs funding pathways. RESULTS/ANTICIPATED RESULTS: Initial findings demonstrated the effectiveness of the Hatchery method. Our pilot study included five different life science startups company tenants. Each company was enabled to de-risk technologies and secure a phase 1 SBIR/ STTR funding or resulted in an exit via acquisition. DISCUSSION/SIGNIFICANCE: Entrepreneurship is a growing approach for testing and expanding new research areas. The Hatchery model makes use of existing space and infrastructure, can scale with an entrepreneurial community, and can serve as critical pilot data for a more permanent space commitment.

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Utility of a Team Science and Project Management Approach to Providing Effective Participant Recruitment Support to Research Teams: The Indiana CTSI Recruitment Concierge Service (RCS)

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OBJECTIVES/GOALS: Evaluate effectiveness of participant recruitment service to improve study enrollment through customer feedback surveys and recruitment data obtained by research teams utilizing services. Use survey information to conduct gap analysis of additional support needed for participant recruitment. METHODS/STUDY POPULATION: Participant enrollment is often cited as one of the most challenging aspects of clinical research. In 2021, the Indiana CTSI used project management techniques to design and pilot a Team Science approach for providing participant recruitment support to clinical research teams. This service called the Indiana CTSI Recruitment Concierge Service (RCS) is comprised of recruitment, community engagement, social media, communications, and project management expertise. Additional experts are chosen to participate based on the study needs (regulatory, population insight, informatics, clinical services, etc.) RCS customers are comprised of study teams from a variety of areas and research experience. These customers are sent surveys to evaluate the support they received and provide suggestions for improvement. RESULTS/ANTICIPATED RESULTS: The RCS assisted 72 study teams in 2021 and 85 (as of November) in 2022. These studies were referred via word of mouth as no advertising of the service had been done to date. All customers were provided a study specific consultation with recommendations of services and resources that would assist their study. Some services recommended were: local study listing and volunteer registry (All IN for Health), digital marketing support, materials design expertise, community engagement and healthcare patient recruitment guidance. The overall feedback from RCS customers has been positive with most teams indicating the support improved their study recruitment and/or engagement plan. RCS will use information obtained to develop a strategy for prioritizing services due to the overwhelming number of requests received. DISCUSSION/SIGNIFICANCE: Using project management techniques and a Team Science approach, the Indiana CTSI was able to develop a comprehensive participant recruitment service that integrates clinical research operations, community engagement, and informatics expertise to design study specific recruitment plans and coordination of services.

Science Policy and Advocacy

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Housing and Environmental Exposures: A Systematic Literature Review on Research and Policy Implications

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OBJECTIVES/GOALS: Poor housing conditions and quality can be linked with residents'environmental exposures, which may contribute to a variety of adverse health outcomes. This systematic literature review will examine literature around housing, environmental exposure, and health; and policy implications to reduce the impact of housing on environmental exposures. METHODS/STUDY POPULATION: This systematic literature review will identify and evaluate published peer-reviewed articles as well as governmental and NGO policy briefs relating to connections between housing quality and condition, neighborhood characteristics, and environmental exposures (e.g., lead poisoning, secondhand smoke, PFAS chemicals) in the United States; and will particularly focus on health implications of such environmental exposures, racial/ethnic and socioeconomic disparities in exposure, and current and future policy recommendations to alleviate the association between housing and environmental risk. A computerized literature search of relevant electronic databases (e.g., PubMed, Sociological Abstracts, EPA database, Congressional database) for literature published after 2000 will be conducted. RESULTS/ANTICIPATED RESULTS: The findings from this literature review will be split up into categorizations around (1) the contribution of housing/neighborhoods on resident

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environmental exposure; (2) geospatial and demographic inequality (historic and current) around housing/neighborhood conditions contributing to disproportionate environmental exposures for low-income and minoritized residents; (3) health implications of environmental exposures; (4) prior policy addressing the connections between housing/neighborhoods and environmental risk; and (5) future policy recommendations to improve housing/neighborhood quality and minimize environmental exposures for residents. DISCUSSION/SIGNIFICANCE: This project will illuminate connections between housing conditions and environmental exposures, health implications of these exposures, and contribute to advancing understanding of potential policies to reduce adverse environmental health impacts of poor housing conditions for residents (particularly for low-income, minoritized groups).

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Impact of Pennsylvania Medicaid payment policy change on rural versus non-rural hospital implementation of immediate postpartum long-acting reversible contraception

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OBJECTIVES/GOALS: To apply implementation science strategies to evaluate the impact of the 2016 Pennsylvania (PA) Medicaid payment policy change on hospital-level access to immediate postpartum long-acting reversible contraception (IPP LARC), an evidence-based strategy to increase contraceptive access; to identify differences by rurality and academic status. METHODS/STUDY POPULATION: We conducted a web-based, IRB-exempt survey of Labor and Delivery (L&D) leaders at all PA hospitals in Summer-Fall 2022, assessing hospital characteristics, contraceptive practices, and facilitators/barriers to IPP LARC implementation, using concepts from health services studies of small subsets of implementing hospitals; we translate these concepts into policy evaluation by sampling the complete population of Pennsylvania hospitals with active L&D units. L&D hospitals were characterized as sustainers if they implemented by 2019 and continued to provide IPP LARC, as implementers if they implemented IPP LARC in 2020-22, and non-implementers if they had not started the process. We use the Center for Rural Pennsylvania definition of rural: counties with RESULTS/ANTICIPATED RESULTS: We collected data from 48/74 (64.9%) hospitals with L&D units. Hospitals were heterogenous with 18/48 (37.5%) in rural counties and 15/48 (31.3%) identifying as academic. A minority of hospitals provide IPP LARC, with 17/48 (35.4%) offering implants and 16/48 (33.3%) offering intrauterine devices (IUD) immediately postpartum. Before the PA Medicaid payment policy change, few offered implants [4/48 (8.3%)] or IUDs [1/48 (2.1%)]. Non-rural hospitals implemented IPP LARC more often and on an earlier timeline than rural hospitals: [7/30 (23.3%) v 3/18 (16.7%)] sustainers, [5/30 (16.6%) v 2/18 (11.1%)] implementers. Common facilitators include clinical champions, meeting patient needs, and adequate knowledge. Planned analyses include implementation barriers, and impact of external implementation support. DISCUSSION/SIGNIFICANCE: Despite unmet need in rural populations for evidence-based contraception, rural hospitals were less likely to implement IPP LARC. Implementation support should be designed to meet the needs of rural hospitals. Implementation science methods can be translated to evaluate the impact of healthcare policy on access to care.

Team Science

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A Comparison of Bone Stresses in Transtibial and Transfemoral Osseointegrated Prostheses

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OBJECTIVES/GOALS: This investigation aimed to develop and validate a subject-specific finite element analysis (FEA) model with subject-specific mechanical loads during walking and to use this method to compare mechanical stresses between transfemoral and transtibial osseointegrated (OI) implants. METHODS/STUDY POPULATION: One patient with a unilateral transtibial OI prosthesis and one with a unilateral transfemoral OI prosthesis participated in motion analysis to collect kinematics and ground reaction forces during overground walking. Subject-specific musculoskeletal models were created, and static optimization was used to estimate muscle and joint reaction forces throughout walking. 3D FEA models of the tibia, femur, and implants were created using ScanIP and exported into ABAQUS CAE. Muscle forces were applied at corresponding origin/insertion locations, determined from the musculoskeletal models [7]. Fixed boundary conditions were applied at proximal joint centers, and bone stresses throughout gait were calculated. OpenSim and FEA derived estimates of joint reaction forces were compared for validation. RESULTS/ANTICIPATED RESULTS: A maximum stress of 65.53 MPa and 60.70 MPa was observed at the bone-implant interface for the transtibial and transfemoral patients (respectively) in the late stance phase of the walking task, corresponding to terminal stance and heel off. Averaged root mean squared errors of the walking task (in the anterior-posterior, inferior-superior, and medial-lateral directions, respectively) for the transtibial and transfemoral patients were (124, 152, 80) N, (71, 80, 30) N, and (190, 62, 30) N, respectively. DISCUSSION/SIGNIFICANCE: The purpose of the above study was to develop a methodology for determining subject-specific mechanical loads during walking using finite element analysis and compare mechanical stresses in patients with transfemoral and transtibial OI. Similar stresses between the two implant types were found.

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A CTS Team Approach to Developing an Effective Vaccine for Non-Typhoidal Salmonella*

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OBJECTIVES/GOALS: Non-Typhoidal Salmonella causes over 95 million infections globally each year, and no effective vaccine exists to combat infections in humans. The goal of this study is to determine the immune protection provided by a novel extracellular

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