

PEDSnet Scholars Program: A Learning Health System Embedded Scientist Training and Research (LHS E-STaR) Center (P30)

Curriculum Content Areas

- *Learning Health Systems*: principles of the LHS science (dimensions, types, maturity model, strategies for achieving a national pediatric LHS); learning from organizational and local data and from improvement and implementation activities at the front-line; and, disseminating learning for broader implementation.
- *Health Equity and Disparities*: designing, implementing and evaluating research projects with an equity lens; using data to identify disparities; disparities embedded in data sources; the history of “race,” “race science,” and “racism and bias” in health care; public health and human experimentation; case study of maternal and neonatal mortality in the US and globally; structural inequities in the US.
- *Engagement Science in Pediatric LHS* science patient and family-centered care principles and methods; identifying and onboarding youth and families onto scientific teams; stakeholder-informed outcomes improvement topic prioritization; co-producing knowledge with stakeholders; shared decision-making methods and tools; addressing differences in health literacy, language, culture; case studies from PEDSnet projects presented by researchers **with** their stakeholders.
- *Implementation Science*: design, implementation, evaluation, and dissemination principles and methods; context evaluation frameworks, hybrid designs; Proctor evaluation framework for implementation outcomes, case studies.
- *Improvement Science*: Model for Improvement; developing and testing innovation prototypes; building confidence in readiness for spread; adapting and scaling promising interventions and models; collaboratives and learning networks; Lean and Six Sigma; approaches to displaying causal/program theory (conceptual models, driver diagrams, logic models); case studies of change practices that scaled successfully and unsuccessful.
- *Epidemiology/HSR and LHS Science*: causal inference principles; directed acyclic graphs (DAGs); dealing with bias and confounding; experimental and quasi-experimental options for rigorous design of LHS research studies; threats to internal and external validity; interpreting meta-analyses and systematic reviews.
- *Data Science*: EHRs and other types of data used in LHS science; data quality concepts and assurance processes; use of LHS science to understand population health and healthcare; clinical decision support systems; common data models and the PEDSnet database; accessing and using PEDSnet and PCORnet data.
- *AI*: promises, pitfalls, and principles of AI in pediatric healthcare; potential inequities fostered by AI; using AI for clinical decision support embedded in the EHR and clinical workflow; case study of the roadmap from algorithm creation and validation to pilot testing to application in clinical practice.

- *Evaluation Frameworks*: process evaluation, with an emphasis on its use with complex interventions; RE-AIM; Realist Evaluation; role of the consolidated framework; contributions of Everett Rogers work on adoption of innovations.
- *Qualitative and Ethnographic Methods*: application to improvement and implementation programs and projects; key informant interviews, focus groups, and survey design; analysis of qualitative data, case studies of adapting the design of interventions to local culture and context.
- *CER Methods*: methods for determining the effectiveness of interventions and the effectiveness of implementation strategies; causal inference methods and analytic approaches using observational data; performing CER at different stages of development of an intervention using implementation and improvement science principles; case studies of CER in LHS science.
- *Population Health*: grounding of population health in equity; managing a population versus improving the health of *the* population; authentic partnerships with communities; co-design and co-production; influences of health policy and healthcare payment models.
- *Effective Communication*: “marketing” and “pitching” ideas and research results; effective data visualization; case studies from public health and dissemination of actionable research results.
- *Ethics and Regulations*: performing LHS science in the context of US health policy, health economics, and regulations; human subjects considerations including privacy and confidentiality; principles of data use agreements; common rule and LHS science.
- *Shared Learning with LHS Executives*: barriers and enablers to performing embedded LHS research; disseminating and implementing promising results institution-wide; scaling interventions to other pediatric institutions.
- *Publication and Funding*: tips for writing LHS science grants with case studies; the peer-review process; developing a funding strategy; open-science trends; writing manuscripts that have an impact; translation for lay audiences and media, funding landscape for LHS science.