10th Annual Conference
Advancing Quality Improvement Science
for Children's Healthcare
Conference Agenda

Thursday, April 29, 2021		
Time	**Topic**	**Speaker**
12:00 – 12:05 pm	Welcome & Conference Overview	TBD
12:05 – 12:50 am	Keynote: TBD	Jean L. Raphael, MD, MPH
12:50 – 1:00 pm	**Break**	
1:00 – 3:00 pm	**Break Out Sessions:**	
	The Fundamentals of QI – Part I	Matthew Niedner, MD
	Interrupted Time Series Analysis	Robert Penfold, PhD
	Complexity Science in QI Research	Lawrence Kleinman, MD, MPH
	Anatomy of a Quality Measure	Rita Mangione-Smith, MD, MPH
	Publishing QI Research: SQUIRE 2.0 and Beyond	Lori Rutman, MD, MPH Patrick W. Brady, MD, MSc
	Context in Quality Improvement Research	Kathleen E. Walsh, MD, MSc Heather Kaplan, MD, MSCE
	Introduction to Qualitative and Mixed Methods in Implementation and QI Research	Clarissa Hsu, PhD Sarah Ronis, MD, MPH
	Building Partnerships in Learning Health Systems	Paula Lozano, MD, MPH Kendra Liljenquist, PhD Gwen Lapham, PhD, MPH, MSW
3:00-4:00 pm	**E-Poster Session**	
4:00-5:00 pm	**Networking**	

10th Annual Conference
Advancing Quality Improvement Science
for Children's Healthcare
Conference Agenda

Friday, April 30, 2021		
Time	**Topic**	**Speaker**
12:00 – 12:05 pm	Welcome Day 2/Intro to Keynote	TBD
12:05 – 12:50 am	Keynote: Harnessing Implementation Science to Realize the Promise of Evidence Based Practice	Rinad Beidas, MD
12:50 – 1:00 pm	**Break**	
1:00 – 3:00 pm	**Break Out Sessions:**	
	The Fundamentals of QI – Part II	Matthew Niedner, MD
	Practical Statistical Process Control (SPC)	Heather Kaplan, MD, MSCE Michael Posencheg, MD Munish Gupta, MD
	Diagnostic Errors and Patient Safety	Michael Rinke, MD, PhD Prashant Mahajan, MD Patrick W. Brady, MD, MSc Trisha Marshall, MD, MSc
	Techniques for Assessing the Impact of System Interventions and Other Innovations on Disparities	Jean L Raphael, MD, MPH Elissa Z Faro, PhD K. Casey Lion, MD, MPH
	Why Should You Care About Implementation Science? Applying Principles of Implementation Science to Pediatric Health	Rinad Beidas, MD Molly Davis, PhD
	How to be a Critical Consumer of QI Research	Alex Kemper, MD, MPH, MS Rita Mangione-Smith, MD, MPH
	QI Shark Tank: Works in Progress	Lawrence Kleinman, MD, MPH Jon Finkelstein, MD, MPH Judith S. Shaw, EdD, MPH, RN
	Big Data for Use in Quality Improvement and Implementation Science	Hanieh Razzaghi, MPH Charles Bailey, MD, PhD
3:00-4:00 pm	**Best Abstracts**	TBD
4:00-5:00 pm	**Networking**	

10th Annual Conference
Advancing Quality Improvement Science for Children's Healthcare
Conference Agenda

Day 1 (Thursday) Breakout Session Descriptions

The Fundamentals of QI – Part 1
This introductory course is appropriate for those participating in or planning quality improvement/patient safety projects, but who have little to modest experience or training in QI science. There are no course prerequisites. This course will include a survey of common over-arching QI methodologies (e.g. lean engineering, the model for improvement, process control), specific QI strategies (e.g. standardization, error-proofing, checklists, iterative PDSAs), issues around quality measures (e.g. outcome measures, process measures, balancing measures), and a very brief introduction into a couple of broad but related concepts (e.g. scoping, high reliability organizations, safety culture). Small groups will take example quality/safety problems, explore possible QI approaches, plan interventions, and interpret mock data. Participants will be encouraged to see how particular problems may suggest very fitting QI approaches, just as a particular QI approach may suggest very fitting analytic methods (covered by many of the other break-out sessions). This session will be led by **Matthew Niedner, MD**, Director of Quality and Safety at the Pediatric Intensive Care Unit (PICU) at CS Mott Children's Hospital, University of Michigan, and co-chair of several multicenter QI collaboratives.

Interrupted Time Series Analysis
Interrupted Time Series (ITS) analysis is the strongest quasi-experimental design for evaluating natural experiments. This session focuses on the use of ITS to measure changes in outcomes over time associated with program implementation or policy changes. Topics will include: when to use an ITS design, strengths and weaknesses of the approach, "real world" enhancements to the design, comparison to statistical process control, and implementation of ITS in SAS and STATA. Participants will also review and critique examples of published pediatric research using ITS. This will be led by **Robert Penfold, PhD**, Senior Investigator at the Kaiser Permanente Washington Health Research Institute.

Complexity Science in QI Research
This session will introduce how principles of complexity science can enhance improvement activities. With both large group and small group interactions we will explore the application of these principles to quality improvement regarding both planning and evaluation. Small group sessions will apply some of these principles to quality improvement, research, planning and evaluation, such as the incorporation of feedback loops, into actual projects that participants are involved with. Participants will emerge with a better understanding of what complexity science is, how to apply it to the QI, research, and evaluation settings, including how to build the science base using QI science. While this session is intended to be an introductory session to the topic it is also suitable for more advanced learners. This session will be led by **Larry Kleinman, MD, MPH**, Professor and Vice Chair Academic Development and Division Chief for Pediatric Population Health, Quality and Implementation Sciences, Rutgers Robert Wood Johnson Medical School.

Anatomy of a Quality Measure
Developing valid and reliable quality measures that are feasible to implement in multiple settings is critical to the conduct of rigorous QI intervention evaluation research. This session will provide an introduction to methods for developing valid, feasible quality indicators and the application of these measures to QI evaluation research. The session will cover common pitfalls in quality measure development and how to avoid them. Participants will have the opportunity to evaluate a set of quality measures and make suggestions for how they might be improved. They will also have the opportunity to develop de-novo quality measures to evaluate the care provided for various clinical scenarios. This session will be led by **Rita Mangione-Smith, MD, MPH**, Vice President for Research and Health Care

Innovation, Kaiser Foundation Health Plan of Washington, Executive Director, Kaiser Permanente Washington Health Research Institute, and Professor, Kaiser School of Medicine.

Publishing QI Research: SQUIRE 2.0 and Beyond
The act of writing can inform a quality improvement project's design and execution. This interactive, practical session will focus on strategies for organizing and writing about quality improvement. Participants will begin with an abstract and run/control chart from a successfully completed QI project and will begin outlining a full manuscript, using the Standards for Quality Improvement Reporting Excellence (SQUIRE) 2.0 Guidelines. We will review specific examples of SQUIRE elements in current healthcare improvement literature with a focus on those most consistently challenging such as the use of theory, the description of context, and the details of small tests of change. We will also discuss general writing pointers and journals that are currently publishing quality improvement, and close with a Q&A from journal editors and reviewers. It will be led by **Lori Rutman, MD, MPH**, Associate Professor of Pediatrics at the University of Washington and member of the national collaborative responsible for developing Standards for Quality Improvement Reporting Excellence (SQUIRE) 2.0 Guidelines and **Patrick W. Brady, MD, MSc**, Associate Professor of Pediatrics and Research Director in Hospital Medicine at Cincinnati Children's Hospital and Associate Editor, *Hospital Pediatrics*. Participants will have an opportunity to employ writing techniques effective for scholarly reporting of QI and implementation science.

Context in Quality Improvement Research
This session will focus on understanding organizational and other contextual factors in implementation efforts. Real world examples will be used in a series of interactive exercises to help learners apply the session's content to their own settings and projects. Classic clinical intervention research is concerned with testing cause-effect relationships in specific experimental instances where context is either irrelevant or its effects are minimized in the design of the study. However, when introducing and testing delivery system interventions designed to improve health care quality and safety, context cannot be ignored. Interventions designed to improve quality are typically complex, sociotechnical interventions whose targets are health care systems, organizations, or groups of providers. As such, these interventions are sensitive to the context in which they are implemented and studies of their effectiveness must include an examination of context, particularly when others are interested in replicating such interventions in their own setting. This session will (1) briefly describe the important role of context in QI interventions; (2) identify some theoretical models and particular methods that can help guide researchers in addressing context in their QI research; and (3) include practical exercises on designing QI research studies to explicitly address the role of context. This session will be led by **Heather Kaplan, MD, MSCE**, Associate Professor, University of Cincinnati Department of Pediatrics and Attending Neonatologist, Neonatology and Pulmonary Biology, Cincinnati Children's Hospital Medical Center and **Kathleen E. Walsh, MD, MSc**, Director of Research, James M Anderson Center for Health System Excellence and Associate Professor, Cincinnati Children's Hospital Medical Center.

Introduction to Qualitative and Mixed Methods in Implementation and QI Research
Numbers alone may not tell the full story regarding the successes and challenges of an intervention or program being implemented. This session will provide an overview of qualitative and mixed methods research. Participants will review the epistemological foundations and relative strengths of qualitative vs. quantitative approaches, explore some common approaches to qualitative research methods, and become conversant with strategies for integrating quantitative and qualitative data. Using case examples, participants will explore how qualitative and/or mixed methods can enhance implementation and QI research, and assess which approaches might be most appropriate for specific QI research questions.

The session will be led jointly by **Clarissa Hsu, PhD**, Assistant Investigator at Kaiser Permanente Washington Health Research Institute (KPWHRI), and **Sarah Ronis, MD, MPH**, Asst. Professor of Pediatrics at Case Western Reserve and Rainbow Babies & Children's Hospital.

Building Partnerships in Learning Health Systems
Embedded researchers depend on health system stakeholders—clinicians, staff, leaders, and patients/families—for the success of their research programs. Mutually beneficial stakeholder relationships help ensure the relevance, feasibility, validity, and success of embedded research programs. These relationships are also crucial for that "last mile"—the translation of research findings into practice through adoption, scale and spread of effective interventions and ultimately, sustainment of improved health care quality. The learning health system framework offers guidance for researchers navigating these partnerships.

Presenters and participants will share lessons from stakeholder partnerships in diverse learning health systems, including an integrated health system and community pediatric practices. We will draw examples from research spanning the pediatric age range. We will discuss strategies that embedded researchers can use to build and sustain partnerships over the course of a research project and beyond, in the pursuit of the quintuple aim. In this interactive session, participants will engage in activities to explore how they can build and maintain relationships with stakeholders in their own partner organizations. The session will be led jointly by **Paula Lozano, MD MPH**, Senior Investigator, Kaiser Permanente Washington Health Research Institute; Senior Medical Director for Research and Translation, Kaiser Permanente Washington; **Kendra Liljenquist PhD**, Assistant Professor of Pediatrics, University of Washington; and **Gwen Lapham, PhD MPH MSW**, Assistant Investigator, Kaiser Permanente Washington Health Research Institute

Day 2 (Friday) Breakout Session Descriptions

The Fundamentals of QI – Part 2
This introductory course is appropriate for those participating in or planning quality improvement/patient safety projects, but who have little to modest experience or training in QI science. There are no course prerequisites. This course will include a survey of common over-arching QI methodologies (e.g. lean engineering, the model for improvement, process control), specific QI strategies (e.g. standardization, error-proofing, checklists, iterative PDSAs), issues around quality measures (e.g. outcome measures, process measures, balancing measures), and a very brief introduction into a couple of broad but related concepts (e.g. scoping, high reliability organizations, safety culture). Small groups will take example quality/safety problems, explore possible QI approaches, plan interventions, and interpret mock data. Participants will be encouraged to see how particular problems may suggest very fitting QI approaches, just as a particular QI approach may suggest very fitting analytic methods (covered by many of the other break-out sessions). This session will be led by **Matthew Niedner, MD**, Director of Quality and Safety at the Pediatric Intensive Care Unit (PICU) at CS Mott Children's Hospital, University of Michigan, and co-chair of several multicenter QI collaboratives.

Practical Statistical Process Control (SPC)
This session is appropriate for those with some familiarity and experience with quality improvement (QI) and safety projects, but who want to learn more about using data to drive improvement. This session will cover the fundamentals of statistical process control (SPC) including the use of run charts and control charts in QI. We will briefly discuss the concept of variation followed by an overview of the principles

of SPC. This will be followed by large and small group exercises demonstrating the use of run charts and control charts in a variety of QI initiatives. We will use a free downloadable trial of SPC software to make control charts, so plan to bring your laptop with administrative rights to download excel add-ins. Ample time will be allowed for questions and answers. For those who are completely unfamiliar with SPC, there will be suggested reading to complete prior to the course so that you will be prepared to participate. This session will be led by **Heather Kaplan, MD, MSCE**, **Munish Gupta, MD, MMSc**, and **Michael Posencheg, MD** all of whom have substantial experience in leading QI initiatives and teaching QI methods.

Diagnostic Errors and Patient Safety
Diagnostic errors are common in children, causing appreciable morbidity, mortality and medico-legal costs. The study of diagnostic errors and resulting diagnostic-related harm remains in its infancy despite being included in the original IOM report *To Err is Human* and the 2015 NASEM *Improving Diagnosis in Health Care* report. This session will describe the current state of science on the epidemiology of diagnostic error and harm in pediatrics and work with participants to identify novel and valid ways to measure and identify these errors in their own contexts. We will use the current state of science to frame the discussion and have participants develop a set of potential interventions to reduce diagnostic errors in their own contexts via research and implementation science methodologies. The session will be led by **Michael Rinke, MD, PhD**, Medical Director of Pediatric Quality and Associate Professor of Pediatrics at the Children's Hospital at Montefiore, **Prashant Mahajan, MD, MPH, MBA**, Professor of Emergency Medicine and Pediatrics, Division Chief of Pediatric Emergency Medicine at the University of Michigan, **Trisha Marshall, MD, MSC**, Asst. Professor of Pediatrics at Cincinnati Children's Hospital, and **Patrick W. Brady, MD, MSc**, Associate Professor of Pediatrics and Research Director in Hospital Medicine at Cincinnati Children's Hospital. Each session leader has longstanding research efforts centered around diagnostic errors and safety in the ambulatory, emergency, and inpatient realms, respectively.

Techniques for Assessing the Impact of System Interventions and Other Innovations on Disparities
What every implementer needs to know: Health care disparities remain pervasive, in spite of growing efforts to address them through research, policy, and QI, and many well-intentioned interventions may either maintain or inadvertently worsen existing disparities or create new ones. In this interactive session, we will discuss the mechanisms by which that can happen and techniques for evaluating the impact of an intervention on disparities. Through small-group exercises using example cases and participants' own projects (ongoing or planned), we will explore the ways in which the underlying process or system, the intervention itself, or the context can contribute to improving, maintaining or worsening disparities, and how to optimally design interventions and evaluations with that in mind. If the group is interested, we can also discuss issues in evaluation design for interventions explicitly aimed at reducing disparities, including study design, qualitative data collection, community engagement, and contextual factors. This session will be relevant for anyone conducting QI interventions or QI research who does not wish to contribute to disparities, as well as those who are explicitly interested in reducing them. It will be led by experienced health disparities researchers, **Elissa Z Faro, PhD**, Asst. Professor of Pediatrics at Children's Hospital at Montefiore/Albert Einstein College of Medicine, **K. Casey Lion, MD, MPH,** Asst. Professor of Pediatrics at University of Washington, and **Jean L Raphael, MD, MPH**, Associate Professor of Pediatrics and Section Head of Academic General Pediatrics at Texas Children's Hospital.

10th Annual Conference
Advancing Quality Improvement Science for Children's Healthcare
Conference Agenda

Why Should You Care About Implementation Science? Applying Principles of Implementation Science to Pediatric Health

Implementation science has emerged as a discipline to bridge the research-to-practice gap given growing concern that discovery and innovation never realize their promise in reaching the individuals in which they are intended to serve. This workshop will provide an overview of implementation science, which is the study of methods to promote the uptake of evidence-based practices and other research evidence in routine care settings in order to improve the quality and effectiveness of health care. Participants will be introduced to the types of research questions, theories, methods, designs, and ethical principles that guide the field. Case examples will focus on applications of implementation science in health and behavioral health, and the workshop will also draw upon the implementation challenges and opportunities faced by the workshop attendees. This session will be led by **Rinad S. Beidas, PhD**, Associate Professor of Psychiatry, Medical Ethics and Health Policy, and Medicine, and Founding Director of the Penn Implementation Science Center at the Leonard Davis Institute of Health Economics (PISCE@LDI), and **Molly Davis, PhD**, NIMH T32 Postdoctoral Research Fellow in Implementation Science.

How to be a Critical Consumer of QI Research

The rapid increase in publications related to quality improvement reflects the recognition of its importance and advancements in methods. How can a reader critically appraise these publications and use these findings to advance a quality-improvement research agenda or use publications to directly improve quality within their local environment? This session will use recent examples of publications across the field of quality improvement to illustrate how to assess validity and extract useful lessons. Through small-group interactive exercises, participants will apply principles of critical appraisal to published QI research to draw meaningful information from the peer reviewed literature. This session will also illustrate how to develop habits to stay on top of the QI-related peer-reviewed literature and organize QI-focused journal clubs. This session will be led by **Rita Mangione-Smith, MD, MPH**, Vice President for Research and Health Care Innovation, Kaiser Foundation Health Plan of Washington, Executive Director, Kaiser Permanente Washington Health Research Institute, and Professor, Kaiser School of Medicine, and **Alex Kemper, MD, MPH, MS**, Professor and Chief, Division of Primary Care Pediatrics, Nationwide Children's Hospital and the Ohio State University, and Deputy Editor of *Pediatrics*. The session is appropriate for all participants, regardless of their level of experience in QI research.

QI Shark Tank: Works in Progress

This session will allow presenters to share their works in progress. This will be an opportunity for those currently engaged in a quality-improvement project to share their successes and challenges and to get advice about how to improve their work. This session will cover all aspects of a rigorous quality improvement project, including study design, human subjects protection, site recruitment, implementation, project management, data collection, data analysis, manuscript writing, and planning for future activities. This will be also be an opportunity for the group as a whole to learn from one another in a dynamic learning environment. The session will be led by **Jon Finkelstein, MD, MPH,** Chief Safety and Quality Office at Boston Children's Hospital; **Larry Kleinman, MD, MPH**, Professor and Vice Chair Academic Development and Division Chief for Pediatric Population Health, Quality and Implementation Sciences, Rutgers Robert Wood Johnson Medical School, and **Judith S. Shaw, EdD, MPH, RN**, Executive Director of the Vermont Child Health Improvement Program (VCHIP) and Professor of Pediatrics at the University of Vermont College of Medicine.

10th Annual Conference
Advancing Quality Improvement Science for Children's Healthcare
Conference Agenda

Big Data for Use in Quality Improvement and Implementation Science

As use of electronic health records and hospital systems has rapidly expanded over the past two decades, new opportunities have opened to examine health care processes and quality in large datasets. The scale of the populations visible through "big data" can improve both efficiency and representativeness of quality measures, and allow detection of rare events. By comparison to traditional chart abstraction or manual data entry, the methods available to use large datasets can also be more efficient and reduce latency, making it possible to more effectively measure tests of change. Conversely, because the scale of analyses does not allow expert review of each event, measurement must rely on automation of cohort construction and event detection. These methods, often termed "computable phenotypes", require careful development that accounts for both the intended use of the measure and the population being evaluated. This session will begin with a review of major pediatric data resources available in the United States, addressing the types of data collected, scope, and how to develop effective processes for data quality assessment in large-scale clinical data. We will also discuss current experience in the development of electronic quality measures, or e-measures, and how these practices relate to clinical research using large-scale data. Participants will have the opportunity to work in small groups to develop example e-measures, reasoning through the measure definition, selection of data sources, creation of e-measurement specifications, and options for e-measure evaluation. The presenters will share their experience with quality measurement in PEDSnet and PCORnet, large-scale EHR-based clinical data networks, to provide insight into some of the pragmatic as well as structural issues encountered in developing large-scale measures. This session will be led by **Hanieh Razzaghi, MPH**, Assistant Director of PEDSnet Data Coordinating Center, Children's Hospital of Philadelphia and **Charles Bailey, MD, PhD**, Associate Professor of Clinical Pediatrics; Director of PEDSnet Data Coordinating Center.