Quality Improvement Research in Pediatric Hospital Medicine and the Role of the Pediatric Research in Inpatient Settings (PRIS) Network

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ABSTRACT

Pediatric hospitalists care for many hospitalized children in community and academic settings, and they must partner with administrators, other inpatient care providers, and researchers to assure the reliable delivery of high-quality, safe, evidence-based, and cost-effective care within the complex inpatient setting. Paralleling the growth of the field of pediatric hospital medicine is the realization that innovations are needed to address some of the most common clinical questions. Some of the unique challenges facing pediatric hospitalists include the lack of evidence for treating common conditions, children with chronic complex conditions, compressed time frame for admissions, and the variety of settings in which hospitalists practice. Most pediatric hospitalists are engaged in some kind of quality improvement (QI) work as hospitals provide many opportunities for QI activity and innovation. There are multiple national efforts in the pediatric hospital medicine community to improve quality, including the Children's Hospital Association (CHA) collaboratives and the Value in Pediatrics Network (VIP). Pediatric hospitalists are also challenged by the differences between QI and QI research; understanding that while improving local care is important, to provide consistent quality care to children we must study single-center and multicenter QI efforts by designing, developing, and evaluating interventions in a rigorous manner, and examine how systems variations impact implementation. The Pediatric Research in Inpatient Setting (PRIS) network is a leader in QI research and has several ongoing projects. The Prioritization project and Pediatric Health Information System Plus (PHIS+) have used administrative data to study variations in care, and the IIPE-PRIS Accelerating Safe Sign-outs (I-PASS) study highlights the potential for innovative QI research methods to improve care and clinical training. We address the importance, current state, accomplishments, and challenges of QI and QI research in pediatric hospital medicine; define the role of the PRIS Network in QI research; describe an exemplary QI research project, the I-PASS Study; address challenges for funding, training and mentorship, and publication; and identify future directions for QI research in pediatric hospital medicine.

KEYWORDS: hospital medicine; hospitalists; implementation; pediatric; quality improvement; research networks

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WHY IS QUALITY IMPROVEMENT (QI) IMPORTANT TO INPATIENT PEDIATRIC CARE?

PEDIATRIC HOSPITALIZATIONS—DEFINED AS inpatient stays for children 17 years of age or younger—comprise approximately 16% of all hospitalizations and 9% of total costs for all patients, representing a total yearly cost of about $34 billion.[1] The most common pediatric discharge diagnoses are respiratory illnesses—pneumonia, asthma, and acute bronchitis—followed by mood disorders.[1] Pediatric

inpatients are cared for in a variety of settings including freestanding children's hospitals, community hospitals with or without dedicated pediatric beds, and children's hospitals within a larger adult hospital. Although some pediatricians have practiced inpatient care for many years, the field of pediatric hospital medicine has emerged in the last 15 years[2] and is now the fastest growing pediatric subspecialty.[3]

Pediatric hospitals have many functions. In addition to providing inpatient medical care to children, they serve as educational institutions, research laboratories, health care safety nets, and sources of employment. These missions sometimes compete, and as the Institutes of Medicine report, *To Err Is Human,* suggests, at times we do not meet our obligation to provide the best-quality care to patients.[4] Pediatric hospital medicine physicians partner with administrators, other inpatient care providers, and researchers to assure the reliable delivery of safe, evidence-based, and cost-effective care. QI programs are our primary means to facilitate change.

WHAT IS THE ROLE OF PEDIATRIC HOSPITALISTS IN QI?

Pediatric hospitalists are a consistent presence on pediatric floors, and they often engage in QI activities as a part of their clinical responsibilities. Many pediatric hospitalists play important roles in their institutions' QI efforts, including authoring clinical practice guidelines, serving on committees, and taking on leadership positions in departments of quality and safety. Pediatric hospitalists face unique challenges as they work to improve the quality of care. Even for some common and straightforward pediatric inpatient diagnoses, we lack the evidence to know what quality care actually represents. For instance, the understanding of the management of bronchiolitis, despite being one of the most common reasons for hospitalization, has advanced little over the last 3 decades.[5] However, even an intervention proven by traditional research methods, such as the randomized clinical trial, may not be successful in real-world practice. Innovation development and adoption are interdependent and must be addressed simultaneously rather than in tandem; QI methodology can give us the tools necessary to translate interventions into effective programs at a broad range of centers. We also need more rapid adoption of existing knowledge. In many cases, adherence to higher-quality, evidence-based care is the exception rather than the rule.[6–10]

Pediatric hospitalists see a wide range of diseases affecting multiple organ systems, and they are often responsible for coordinating the opinions of multiple subspecialists. This can make providing quality care especially difficult when the diagnosis is unclear or when the subspecialists disagree. Many of our patients have complex chronic conditions, and we must balance the benefits and harms of interventions that may affect already damaged organ systems. Children have an average length of stay of 3.8 days.[1] This creates a compressed time frame that may create a tension between providing children with high-quality care and facilitating discharges in busy facilities with patients waiting for beds. On the other hand, in some cases, a shorter length of stay may represent an appropriate reluctance to offer unnecessary interventions. Pediatric hospitalists must understand the difference. Finally, the wide variety of settings in which pediatric hospitalists practice provides diversity but also complexity. Teaching services in academic hospitals present challenges to communication and balancing the needs of the learners with the needs of the patients. Community sites have fewer resources available for consultation and overnight coverage, and many staff members may not have extensive experience with pediatric care. The complex environment of the hospital is filled with an array of patients, families, physicians, other care providers, payers, and organizational factors. Such contextual factors cannot be dismissed as confounders or noise and simply ignored. Rather, they should be captured and considered as we seek to improve delivery of care in the pediatric inpatient setting. Pediatric hospitalists must deliver high-quality care for hospitalized children regardless of the setting. QI is the primary method with which pediatric hospitalists can understand systems and processes, and therefore effect change.

CURRENT STATE OF QI IN PEDIATRIC HOSPITAL MEDICINE

Hospitals have many opportunities for QI activity and innovation. As embedded hospital workers, hospitalists have a unique understanding of the hospital setting. Many pediatric hospitalists are engaged in QI activities either informally or on guideline committees, and some have developed skills to lead QI initiatives through official roles as quality and safety officers. The American Board of Pediatrics (ABP) Maintenance of Certification (MOC) Part 4 requirement provides yet another avenue for increasing participation in hospital-based QI. Mandated reporting of quality and safety measures will further drive the dissemination of recommended practices.[6,11]

Although large-scale QI collaboratives such as those within the Children's Hospital Association (CHA) have increasingly been used to disseminate recommended practices among a wide range of specialties,[12–14] pediatric hospitalists have begun their own independent efforts. A grassroots effort has arisen within the pediatric hospital medicine community to bring QI collaboratives to nonfreestanding pediatric units and hospitals, where the majority of children are hospitalized.[15] Founded in 2008, the Value in Inpatient Pediatrics (VIP) Network has become an inclusive improvement organization for pediatric hospitalists seeking to learn, share, and change across the continuum, from small community hospitals to tertiary-care academic centers. VIP initially targeted the slow pace of implementation of evidence-based care for bronchiolitis with a primary benchmarking initiative and recently published demonstrations of decreased bronchodilator utilization across the network.[16] Additional initiatives have also demonstrated improvement with reductions in patient identification band errors and improved timeliness of discharge communication across participating sites.[17,18] These