To Readmission and Beyond!

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The study of pediatric readmission has received significant attention since 2012, when the Centers for Medicare and Medicaid Services signaled the possibility of financial risk to hospitals based on pediatric 30-day readmission rates.[1] We have since learned that readmission rates appear to depend on many factors,[2,3] the importance of which vary by age and medical condition,[4–6] surgical procedure,[7–9] the presence of chronic or complex care needs,[10,11] social determinants of health,[12,13] access to care,[14–16] adherence to evidence-based practice,[17–19] and patient–health system interactions, particularly those involving transitions of care and care coordination.[20–22] Identifying prevention targets has been hampered by limited study generalizability and the paucity of preventable phenomena.[23] In fact, it has been estimated that preventable readmissions represent <2% of all pediatric admissions.[24] Whereas a short length of stay (LOS) has been associated with an increased risk of readmission in certain adult patient populations,[25] a longer LOS is not necessarily associated with fewer readmissions, and there remains little evidence to support any such association for pediatric care.

In this month's issue of *Pediatrics*, Markham et al[26] are the first to use a nationally representative sample selected from the Nationwide Readmissions Database (NRD)[27] to analyze episodes of hospitalization composed of either solitary or sequential admissions that were assigned to the same All Patient Refined Diagnosis Related Group.[28] When children were readmitted, the total LOS doubled and the cost of care was 2.3 times greater than when a single admission defined the episode. Readmissions that occurred at a different hospital from the index admission were 36% costlier than same-hospital readmissions. Infants with fever, 10 to 18-year-olds with appendectomy, and 1 to 9-year-olds with nonbacterial gastroenteritis ranked the highest in readmission-associated increases in episode LOS.

The authors move the readmission literature in the right direction by modeling episodes of illness, rather than isolated encounters. Their finding of differential costs for nonindex hospital readmissions is intriguing. Additional techniques will be needed to explore the extent to which factors such as patient selection bias, variability in practice and availability of clinical expertise and services account for this finding in different regions. The high LOS and readmission clinical categories represent other priority areas for further study.

As for the study's policy implications, it is important to recognize that although the NRD effectively tracks patterns of care usage, it contains no data specifically intended to measure the rationale for readmission[29] and little data from which to model social risk.[20,30] The authors' suggestion that policies to discourage readmissions at nonindex hospitals would represent a potential cost savings of $28.4 million annually (assuming 50% effectiveness) is therefore speculative, and if implemented, potentially counterproductive. For example, a simple reduction in reimbursement could induce smaller hospitals to stop admitting children altogether. This would exacerbate travel and work disruption for families,[31,32] most of

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whom would never have experienced readmission. Interventions to reduce costs, shorten LOS, and reduce readmissions should be based on models that explain variation at both clinical and population levels.

Fortunately, the journey toward health system usage models informed by social determinants of health and care coordination is underway. Just as the NRD was made possible by the standardization and ubiquity of electronic claims data, new opportunities arise from increased interoperability of mobile health platforms and electronic health records (EHRs). Patient care workflows increasingly include patient and family participation in decision-making,[33] care coordination,[34] and outcomes reporting[35–37] as a strategy to improve patient safety, increase patient and family centeredness, and target population health goals. These activities rely on software, and as such, create new data.

If the information generated at the point of care is sufficiently encoded and standardized, its original meaning can be retained to analyze the decisions, goals, and plans that ultimately determine health system properties, such as LOS, cost, and readmission rates. Technically, this can be achieved if the underlying data are represented by profiled reference terminologies[38] and are made available to research, quality improvement public health networks that share common data models, and application programming interfaces.[39,40]

We are starting to see these layers culminate in applications that augment native EHR functionality as "plug-ins" or as free-standing Web or mobile device-based applications that interact with EHRs.[41–45] The dissemination of a user-friendly application to support evidence-based discharge planning[21] would be immediately useful and would generate testable insights about the effects of discrete discharge planning elements. The same application could itemize action plans for a positive food insecurity screening test[46] for a family member while generating an appropriate current procedural terminology code for the screening test,[47] which would, in effect, operationalize the social history.[48] As a functional layer on top of the EHR, application development cycles can be driven by clinical and public health stakeholders rather than by EHR vendors.

In isolation, pediatric readmission remains a flawed hospital performance measure.[49–52] Standards-based interoperable tools, integrated into meaningful workflows, will enable families and clinicians to tell the many stories of what type of care is needed, where it should be provided, by whom, and for how long. With their analysis, Markham et al[26] have taken steps toward a more contextualized framework, but new tools and practices will be needed to go further.

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ABBREVIATIONS

EHR: electronic health record
LOS: length of stay
NRD: Nationwide Readmissions Database

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