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Preventing Pediatric Readmissions: Which Ones and How?

Hospital readmission rates constitute an established, if disputed, quality metric in adult healthcare.[1,2] High readmission rates can adversely affect hospital revenue and prestige. The Centers for Medicare and Medicaid Services levies financial penalties for "excessive" readmissions after an initial admission for selected conditions, such as acute myocardial infarction, heart failure, and pneumonia. Centers for Medicare and Medicaid Services is expanding the number of initial diagnoses covered and the penalties reach 3% of all Medicare reimbursements in 2015 for hospitals with excessive readmissions. Additionally, the Hospital Compare website[3] displays hospital readmission rates and allows comparisons among hospitals in the same geographic area.

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This focus on readmission rates has also arisen in pediatric health care. Readmission rates have been examined and reported,[4-6] and "excessive" rates lead in some states to financial penalties by Medicaid.[7] Pediatric readmissions impart medical risks to the patient, create inconvenience for patients and families, and may reflect suboptimal inpatient care or care transitions to community clinicians. These factors, coupled with the putative cost savings associated with reducing readmissions (27.3% of $1.7 billion in children's hospitals, according to Gay et al[8] in this issue of *The Journal*), ensure that readmissions will endure as a quality metric.

However, pediatric readmissions have not been a straightforward quality measure.[9] Unlike medication errors or wrong-site surgeries, which should always be preventable, readmissions do not necessarily reflect suboptimal care and most are not preventable.[6,8] In our experience, most readmissions within 7 days of discharge are planned. Furthermore, sociodemographic and other factors adversely affect readmission rates to an extent that likely varies by center.[1] Although clinicians and health systems can prevent some readmissions, the question is which readmissions could be prevented and by whom. The evidence base supporting effective practices to prevent pediatric readmissions is thin. Quality metrics should be accurate and actionable. By those criteria, pediatric readmission rate, as a quality metric, needs refinement.

PPR	"Potentially" preventable readmissions

In this issue of *The Journal*, two groups report their observations on hospital readmissions and contribute to our knowledge of the accuracy and actionability of readmission rates as a quality metric.[8,9] Gay et al report "potentially" preventable readmissions (PPR) from a large sample of patients from children's hospitals using the 3M PPR software (3M, St Paul, Minnesota),[8] and Edmonson et al report readmissions and revisits after tonsillectomy in a statewide database.[9] The two groups took divergent approaches but converge on similar conclusions. Pediatric readmissions occur commonly, and seem like they should be preventable, at least in some instances. Both studies also suggest that one of the first targets for reducing readmissions should be those that occur after procedures, especially elective procedures.

Edmonson et al examined hospital, emergency department, and clinic revisits in pediatric and young adult patients after tonsillectomy.[9] They found an 8.6% to 24.5% revisit rate that increased with age. Pain, nausea/vomiting, and dehydration prompted 68% of these revisits. By choosing a single, elective procedure, the authors provide a reproducible readmissions metric, which should be applicable to most hospitals. Their observations are actionable in that they identify a high-risk population, adolescents, and their data suggest that better patient preparation prior to discharge and outpatient management after discharge could prevent many revisits.

Gay et al used the proprietary, 3M PPR software to distinguish "potentially" preventable from all-cause readmissions.[8] This comprehensive, electronic approach possesses many appealing features for payers and regulators, but holds less appeal for clinicians. The software uses administrative data, so there is no need to acquire additional data or perform case review. The software identifies only PPR and does so in aggregate, thus preventing a clinician's challenge that a specific patient's readmission was not preventable. The software starts by examining all discharges using combinations of All Patient Refined Diagnosis Related Groups at discharge and readmission and other

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factors to identify PPR. However, as Gay et al emphasize in their discussion, this software still needs validation in pediatric populations and likely requires refinement. That such software should be used to adjust pediatric caregivers' reimbursement or rank performance seems premature, if not unfair, until more evidence supports the accuracy of the software's assessments about the "potential" preventability of pediatric readmissions.

There are reasons to believe that the software does not produce accurate estimates in all cases. Jackson et al reported that the 3M PPR software performed with 85% sensitivity, but only 28% specificity in a sample of 459 all-cause, adult readmissions.[10] Additionally, one would expect the percentage of PPR to diminish the further a readmission occurred from the index discharge. However, Gay et al report similar percentages, 39%-41% of all-cause readmissions as potentially preventable at 7, 15, and 30 days after discharge. The current study assessed 81% of readmissions in patients with sickle cell disease as potentially preventable. This far exceeds our institution's experience with this medically fragile and socially vulnerable group of patients. The available data indicate a need for additional validation of the software to assure accuracy of the estimates in pediatric populations, as Gay et al discuss. We hope that these researchers will continue their studies of the 3M PPR software to validate and improve its accuracy, if needed.

Both the 3M PPR software and the work of Edmonson et al suggest that readmissions after surgical procedures should be an early focus of our efforts to prevent readmissions. Edmonson et al found that adolescents have a 24.5% revisit rate following tonsillectomy. The 3M PPR software estimated that up to 98% of appendectomy readmissions were preventable. These studies provide valuable insight as to how we might approach the use of readmissions as a quality metric, but are not definitive.

So where do we go from here? We believe that some pediatric readmissions can be prevented, and we make three recommendations. Using administrative data to characterize clinical events is fraught with potential challenges. These data are subject to the vagaries of coding practices and do not always capture the socio-demographic factors and complex medical conditions of pediatric patients. Not all pediatric admissions occur in children's hospitals and not all readmissions occur at the site of the initial admission. We have found that our institutional-specific readmission rate understates the actual rate (which includes readmissions to hospitals other than our own) by about 15%. We need comprehensive data that include socio-demographic and clinical variables to understand better the reasons for readmissions. This requires collaboration with community clinicians and payers.

We need a better understanding of interventions that will reduce readmissions. Our hospital's work with the Children's Hospitals Association Solutions for Patient Safety Collaborative has clearly identified many ways we can improve the discharge process. Other collaboratives such as those sponsored by the Institute for Healthcare Improvement and state hospital associations offer valuable assistance and collaboration, but there is little evidence to support specific interventions in the pediatric population.

Quality improvement teams may be most effective when they focus on well-defined conditions with a high rate of readmissions. At our institution, this would include patients with sickle cell disease crises, ventriculoperitoneal shunt insertion, and others. It is clear that the discharge process can be globally improved, but there is little evidence beyond intuition supporting any of the many possible, expensive interventions.

It appears that about 20% of pediatric readmissions might be preventable and we should be diligently engaged in preventing them. However, we need more research to know which ones and how. Until we know more about preventing readmissions, collaborations rather than penalties seem to be the productive path to follow. ■

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