Are Pediatric Readmission Reduction Efforts Falling Flat?

JoAnna K Leyenaar, MD, MPH, PhD[1]*, Tara Lagu, MD, MPH[2], Peter K Lindenauer, MD, MSc[2,3]

[1]*Department of Pediatrics and the Dartmouth Institute for Health Policy & Clinical Practice, Dartmouth Hitchcock Medical Center, Lebanon, New Hampshire;* [2]*Institute for Healthcare Delivery and Population Science, University of Massachusetts Medical School-Baystate, Springfield, Massachusetts;* [3]*Department of Population and Quantitative Health Sciences, University of Massachusetts Medical School, Worcester, Massachusetts.*

In an effort to improve healthcare for Americans by linking hospital payments to quality of care, Medicare's Hospital Readmission Reduction Program (HRRP) began penalizing hospitals with "excess" readmission rates in 2012. The decision sparked widespread debate about the definition of a preventable readmission and whether a patient's socioeconomic status should be considered for risk adjustment. Although coming back to the hospital after an admission is an undesirable outcome for any patient, the suitability of readmission as a quality measure remains a hot and debated topic. Research on the subject skyrocketed; over 12000 articles about hospital readmissions have been indexed in PubMed since 2000, and the number of publications has steadily increased since 2010 (Figure).

Although the HRRP is a Medicare initiative, there has been a substantial focus on readmissions in pediatrics as well. The National Quality Forum has endorsed three quality measures specific to readmission in children: (1) the rate of unplanned readmissions to the pediatric intensive care unit within 24 hours after discharge or transfer, (2) the pediatric lower respiratory infection readmission measure, defined as the percentage of admissions followed by one or more readmissions within 30 days of hospitalization for lower respiratory infection, and (3) the pediatric all-cause readmission measure, defined as the percentage of admissions followed by one or more readmissions within 30 days. These endorsements were preceded by studies showing that pediatric readmission rates varied substantially across hospitals and clinical conditions, and that children with chronic illnesses were at the highest risk.

Readmission is an attractive pediatric quality measure for a number of reasons. This measure is easy to apply to data at the hospital, health system, and payor levels at relatively low cost. Relatedly, the all-condition measure can be applied to all pediatric hospitalizations, overcoming the very real challenge in pediatric quality measurement of inadequate sample sizes to discern differences in healthcare quality at the hospital level for many disease-specific measures.[1] In addition, this measure moves beyond process measurement to quantify an outcome relevant to families as well as healthcare systems. Finally, the measure is founded on a compelling conceptual framework (albeit one that remains challenging to prove) that efforts to improve a patient's hospital-to-home transition and discharge readiness will reduce their likelihood of readmission.

In this issue of the *Journal of Hospital Medicine*, Katherine Auger and colleagues present their analysis of pediatric readmission rates from 2010 to 2016 across 66 children's hospitals.[2] They found that the median seven-day all-cause pediatric readmission rate was 5.1%, with no change in rates over the seven-year study period. Applying proprietary software to identify potentially preventable readmissions (PPR), they reported that approximately 40% of these readmissions may be preventable, a proportion that was also unchanged over time. Interestingly, 88% of the hospitals represented in their data were participating in the Solutions for Patient Safety national learning collaborative during the study period, making efforts to reduce seven-day readmission rates. Despite this, the figures presented in this paper of all-condition and potentially preventable readmission rates over time are very, very flat.

This work by Auger et al. contributes to our understanding about the preventability, or lack thereof, of pediatric all-condition readmissions. If 40% of these readmissions are indeed preventable, then why did Auger et al. not observe a declining proportion of PPR over time as a result of hospital participation in a national collaborative? Past quantitative and qualitative studies provide important context. First, the 40% rate of readmission preventability is twofold higher than that reported in past studies that relied on physician judgement to determine readmission preventability;[3,4] the authors' use of proprietary software to categorize the preventability of a readmission limits our ability to explain the differences in these rates. However, in these past studies, the rates of initial agreement between physician reviewers about readmission preventability were poor, highlighting the challenges associated with determining readmission preventability. Moreover, qualitative studies suggest that physicians and families lack a shared understanding of the preventability of readmissions.[5] Finally, a systematic review of pediatric hospital discharge interventions did not identify any one intervention that was consistently effective in reducing hospital readmission rates.[6] The following important questions remain: Were hospitals' efforts to reduce PPR targeting the wrong patients? Were the interventions insufficient or ineffective? Or are readmission measures insufficiently sensitive to improved processes of care?

Recognizing that the majority of research on readmission as well as HRRP penalties focuses on adult populations, perhaps we can apply some lessons learned from the HRRP to

***Corresponding Author:** JoAnna K. Leyenaar, MD; E-mail: JoAnna.K.Leyenaar@hitchcock.org; Telephone: (603) 653-0855

Received: May 30, 2019; **Accepted**: June 17, 2019

 DOI 10.12788/jhm.3269

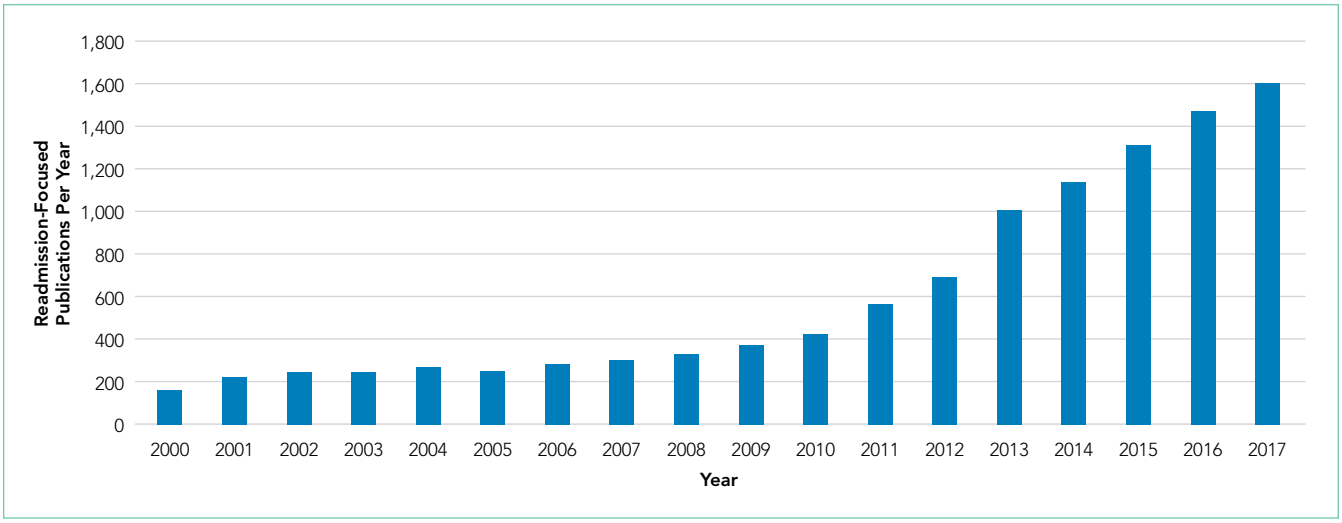

FIG. Readmission-Focused Publications Indexed in PubMed by Using a Medical Subject Heading of "Hospital Readmission" since 2000.

pediatrics. Recent analyses by Medicare Payment Advisory Commission (MedPAC) suggest that raw and risk-adjusted readmission rates have declined for conditions covered by the HRRP, with readmission rates for HRRP target conditions declining more quickly than that for nontarget conditions.[7] Just as the HRRP has focused on target conditions with relatively high readmission rates, analogous efforts to focus pediatric readmission reduction on children at greatest risk may enable measurement of change over time. For example, although children with complex chronic medical conditions represent a small proportion of the pediatric population, they account for 60% of all pediatric readmissions in the United States. However, similar to the above-described meta-analysis of readmission reduction efforts in children, at least one meta-analysis has demonstrated that there is no one intervention or even bundle of interventions that has consistently reduced readmissions in adults.[8] Although the readmission rates for HRRP target conditions have decreased, the results of clinical trials evaluating readmission reduction efforts are difficult to translate into practice given substantial heterogeneity in study designs, interventions, and patient populations.

Does this study by Auger et al. suggest that pediatric readmission reduction efforts are misguided or futile? No. But it does provide compelling data that efforts to reduce all-cause readmissions for all children may not yield measureable changes using the current measures. A narrowed focus on children with chronic illnesses, who account for approximately half of all pediatric admissions, may be warranted. A number of studies have summarized families' preferences regarding their hospital-to-home transitions; the results indicate that families of children with chronic illness have unique desires and needs.[9,10] Perhaps it is time to take a step back from pediatric readmission reduction efforts, largely inspired by the HRRP, and redirect our resources to implement and evaluate processes and outcomes most valued by children and their families.

Disclosures: Drs. Lagu and Lindenauer have served as consultants for the Yale Center for Outcomes Research and Evaluation (under contract to the Centers for Medicare and Medicaid Services) providing clinical and methodological expertise and input on the development, reevaluation, and implementation of hospital outcome and efficiency measures. .

Funding: Dr. Lagu is supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health under Award R01 HL139985-01A1 and 1R01HL146884-01. Dr. Lindenauer was supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health under Award Number K24HL132008.

Disclaimer: The views expressed in this manuscript do not necessarily reflect those of the Yale Center for Outcomes Research and Evaluation or the Centers for Medicare and Medicaid Services. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

References

1. Berry JG, Zaslavsky AM, Toomey SL, et al. Recognizing differences in hospital quality performance for pediatric inpatient care. *Pediatrics*. 2015;136(2):251-262. https://doi.org/10.1542/peds.2014-3131.
2. Auger K, Harris M, Gay J, et al. Progress (?) towards reducing pediatric readmissions. *J Hosp Med*. 2019;14(10):618-621. https://doi.org/10.12788/jhm.3210
3. Hain PD, Gay JC, Berutti TW, Whitney GM, Wang W, Saville BR. Preventability of early readmissions at a children's hospital. *Pediatrics*. 2013;131(1):e171-e181. https://doi.org/10.1542/peds.2012-0820.
4. Wallace SS, Keller SL, Falco CN, et al. An examination of physician-, caregiver-, and disease-related factors associated with readmission from a pediatric hospital medicine service. *Hosp Pediatr*. 2015;5(11):566-573. https://doi.org/10.1542/hpeds.2015-0015.
5. Brittan M, Albright K, Cifuentes M, Jimenez-Zambrano A, Kempe A. Parent and provider perspectives on pediatric readmissions: what can we learn about readiness for discharge?. *Hosp Pediatr*. 2015;5(11):559-565. https://doi.org/10.1542/hpeds.2015-0034.
6. Auger K, Kenyon CC, Feudtner C, Davis MM. Pediatric hospital discharge interventions to reduce subsequent utilization: a systematic review. *J Hosp Med*. 2014;9(4):251-260. https://doi.org/10.1002/jhm.2134.
7. NEJM Catalyst. Hospital Readmissions Reduction Program (HRRP). Available at: https://catalyst.nejm.org/hospital-readmissions-reduction-program-hrrp/. Accessed May 21, 2019.
8. Hansen L, Young R, Hinami K, Leung A, Williams M. Interventions to reduce 30-day rehospitalization: a systematic review. *Ann Intern Med*. 2011;155(8):520-528. https://doi.org/10.7326/0003-4819-155-8-201110180-00008.
9. Leyenaar J, O'Brien E, Leslie L, Lindenauer P, Mangione-Smith R. Families' priorities regarding hospital-to-home transitions for children with medical complexity. *Pediatrics*. 2017;139(1): e20161581. https://doi.org/10.1542/peds.2016-1581.
10. Desai AD, Durkin LK, Jacob-Files EA, Mangione-Smith R. Caregiver perceptions of hospital to home transitions according to medical complexity: a qualitative study. *Acad Pediatr*. 2016;16(2):136-144. https://doi.org/10.1016/j.acap.2015.08.003.