

BRIEF REPORT

Provider Feedback: A Potential Method to Reduce Readmissions

Mark S. Brittan, MD, MPH,^{a,b} Victoria Fischman, BA,^c Sara E. Martin, RN, BSN, CPN,^d Angela Moss, MS,^b David Keller, MD^a

There is growing emphasis on improving hospital discharge planning and transitional care for children.¹ Many of the potential elements, such as medication reconciliation, patient education, scheduling of outpatient follow-up visits, and postdischarge telephone or home nursing outreach, can be added or improved through process change and new resource allocation.

In adult and elderly patients, poor quality-of-care transitions have been linked to higher readmission rates, and bundled transitional care interventions have decreased readmissions in these patients.² There is less published evidence on the impact of such interventions in hospitalized children.³ The value of readmissions as a metric of pediatric hospital care quality and the potential impact of interventions aimed at improving hospital discharge remains in question.⁴⁻⁶

Despite this uncertainty, pediatric readmission metrics are being incorporated into quality and payment reform, which drives efforts to further understand the etiologies of pediatric readmissions.⁷ As part of a broader quality improvement initiative to reduce readmissions, we notified inpatient providers about their patients' readmissions and sought their perceptions about the preventability and causes of readmissions. In this study, we analyzed their responses to describe (1) the preventability of 30-day readmissions, and (2) causes of potentially avoidable readmissions as judged by inpatient clinicians.

METHODS

Population and Setting

This work occurred at Children's Hospital Colorado, a free-standing tertiary care center with more than 20 000 hospital discharges per year. The project was performed by our readmissions team within the context of a national quality improvement collaborative.⁸ We developed a process of e-mail notification for providers of children with unplanned 30-day readmissions between June and December 2013. E-mails were sent to the discharging provider from the index admission and the readmitting provider. Children discharged from all hospital services and units were included. The project was approved as quality improvement by the Children's Hospital Organizational Research Risk and Quality Improvement Review Panel which exempts the project from institutional review board review.

Procedures

Weekly 30-day readmission reports were generated by our hospital's information technology department. Planned readmissions were excluded via an electronic flag indicating that the admission encounter was entered into the

www.hospitalpediatrics.org

DOI:10.1542/hpeds.2016-0029

Copyright © 2016 by the American Academy of Pediatrics

Address correspondence to Mark Brittan, MD, MPH, 13123 E. 16th Ave, Aurora, CO 80045. E-mail: mark.brittan@childrenscolorado.org

HOSPITAL PEDIATRICS (ISSN Numbers: Print, 2154-1663; Online, 2154-1671).

FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: Dr Brittan received salary support from an institutional Research Scholar Award and the project was supported by funding from an institutional Clinical and Operational Effectiveness and Patient Safety Grant.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

^aDepartments of Pediatrics, and ^dQuality and Patient Safety, Children's Hospital Colorado, Aurora, Colorado; ^bACCORDS (Adult and Child Center for Health Outcomes Research and Delivery Science), University of Colorado School of Medicine, Aurora, Colorado; and ^cTufts University School of Medicine, Boston, Massachusetts

electronic medical record on a date before the admission date, and therefore was planned ahead of time.⁹ The report included patient name, discharge and readmitting dates, and discharge and readmitting attending. A research assistant sent weekly e-mail batches to both the discharging and readmitting attending provider of each readmitted child based on these reports. The e-mail included an introduction of the quality improvement project and goals, the patient's name and medical record number, and a brief survey within the body of the e-mail. E-mails were sent simultaneously to both providers so that each could see and respond to the other's replies. Responses were e-mailed back to the research assistant and transposed to the readmissions report in Microsoft Excel (Microsoft Corp, Redmond, WA) for subsequent analysis. If 2 providers responded differently to a specific question for a given patient, a "yes" or "likely" response was preferentially entered into the spreadsheet over a neutral or negative response. As such, in analysis, readmissions were categorized as potentially avoidable if one of the providers answered "yes" or "likely" and the other provider answered "no" or "likely not" to the question of whether the readmission could have been avoidable.

Survey Tool

Our quality improvement team designed the survey to include queries about factors that are hypothesized to contribute to readmissions.¹⁰ We asked if the readmission was planned to further distinguish planned readmissions erroneously included in the automated report. We also queried if the readmission could have been avoided. For ease of use, we requested categorical (Yes/No) responses, although sometimes providers responded with less certainty (eg, maybe or not sure). We also included an open-ended question at the end of the survey (ie, what other factors contributed to this readmission?) (Fig 1).

Analysis

Although e-mails were sent for all medical and surgical readmissions, we excluded oncology and bone marrow transplant readmissions from analysis, as the reviews

were conducted by the medical director of oncology (by request) and not by discharging and readmitting providers. We analyzed readmissions of all remaining surgical, medical, and medical subspecialty patients.

We described the frequency of responses by discharging provider only, readmitting provider only, both providers, or same provider (ie, same person on service for discharge and readmission). We described the percentages of readmissions that were considered potentially avoidable (response: yes or likely), uncertain (response: possibly, maybe, unsure), and unavoidable (response: no or likely not).

The remaining survey categories pertained to causal factors of the readmissions (eg, disease progression, problems with discharge instructions). Responses about causal factors were similarly categorized as likely yes, uncertain, or likely no. We compared the frequency of "likely or yes" responses for each factor between potentially avoidable and unavoidable readmissions using the χ^2 or Fisher's exact tests.

The primary investigator (MB) reviewed qualitative comments to identify additional perceptions about causes of potentially avoidable readmissions. Comments were mapped to categories of disease progression, complication from previous admission, and new disease process to gain more insight into these factors. Microsoft Excel and SAS v. 9.4 (SAS Institute, Inc, Cary, NC) were used for data storage and analysis.

RESULTS

We received provider responses for 351 of 493 unplanned readmissions. Ninety-two oncology and bone marrow transplant readmissions were excluded, and we analyzed 259 (66%) of 401 readmissions. Forty-five (17%) readmissions were considered potentially avoidable, 29 (11%) uncertain, and 185 (71%) unavoidable.

Table 1 shows the breakdown of responses and preventability ratings by type of provider. We received the most responses from readmitting providers only (60%), followed by discharging providers only

(24%), both providers (10%), and same provider on service for both hospitalizations (6%). Readmissions were more often judged to be potentially avoidable when the same provider was on service for both hospitalizations, and when both providers responded (Table 1).

Providers attributed potentially avoidable ($n = 45$) versus unavoidable ($n = 185$) readmissions to the following factors: disease progression (40.0% vs 45.9%; $P = .5$), previous admission complication (33.3% vs 15.1%; $P = .006$), new disease process (26.7% vs 40.0%; $P = .07$), problems/adhering to discharge instructions (24.4% vs 3.2%; $P < .0001$), insufficient family/community supports (17.8% vs 5.4%; $P = .006$), inability to obtain/correctly administer medications (8.9% vs 2.2%; $P = .05$), home health problem (11.1% vs 2.7%; $P = .03$), and suboptimal outpatient follow-up (8.9% vs 0.5%; $P = .006$).

Table 2 shows examples of provider comments for 3 categories of potentially avoidable readmissions: disease progression, complication from previous admission, and new disease process. The responses suggested problems with care coordination, community resources, clinical practice, and communication across settings in preventable readmissions. A few readmissions were thought unnecessary (ie, prompted by undue outpatient provider or parent concerns). Preventable complications from the previous admission were most often linked to surgery, including postoperative infection. One response revealed how readmission notification might spur additional review/action: "This is one that I think we all need to discuss. A care conference is in the works again, but there is a breakdown in the system in my opinion for this patient."

DISCUSSION

To our knowledge, this is the first pediatric study to describe provider perceptions of readmission preventability and etiologies via e-mailed survey responses. Seventeen percent of unplanned 30-day readmissions were deemed potentially avoidable and 11% were considered uncertain. Rates of potentially preventable readmission have

| INSTRUCTIONS | | Y / N |
|---|--|-------|
| Please reply to this message inserting your feedback from this discharge/readmission. All responses are confidential and protected by the Quality and Patient Safety Department | | |
| 1. | Were you directly involved in this patient's care? | |
| 2. | Was this readmission planned? If no, what were the primary reasons for readmission? | |
| 3. | • Disease progression | |
| | • Complication from previous admission | |
| | • New disease process | |
| | • Medications: Inability to obtain / correctly administer | |
| | • Discharge Instructions: Lack of understanding or / non-adherence | |
| | • Home health care: Inability to obtain or failure of systems | |
| | • Sub-optimal outpatient follow up | |
| | • Family / Community Support issues | |
| 4. | In your opinion, could this readmission potentially have been avoidable? | |
| 5. | Why or why not? In your opinion, what other factors contributed to this readmission? | |

FIGURE 1 Data collection instrument.

varied from 20% to 50% in previous studies using medical record review, application of preventability software to administrative data, and qualitative methods.^{6,11-13}

We identified varied and complex reasons for potentially avoidable readmissions, some of which would be addressed by broad improvements to health care systems and hospital discharge. Factors relating to the quality of hospital discharge and care transitions were more prominently identified for potentially avoidable readmissions than unavoidable ones. The most frequently identified factors for avoidable readmissions were disease progression, previous admission complication (often related to surgery), new disease process, and discharge instructions/adherence. Respondents attributed avoidable disease progression or new disease process to clinical management (ie, diagnosis and treatment), care coordination (communication across settings, outpatient services), and discharge preparation/instructions. Providers infrequently attributed readmission to

premature hospital discharge. We noted in a previous study that parents more often attributed readmission to premature hospital discharge than providers.¹⁴

We did not gather perceptions of other stakeholders in this study (parents, outpatient providers, allied health workers), which would yield more comprehensive and balanced perspectives.

Structured feedback to providers may reduce readmissions by allowing clinicians to reflect on their own clinical and transitional care practices, although there is not yet published evidence to support this premise in pediatrics. We have limited data tying our surveys to readmission rates and we are currently evaluating the effect of our surveys as part of a multifaceted intervention on readmission rates in children with special health care needs.

In the adult setting, introduction of an automated physician feedback system coincided with a significant decrease in readmissions.¹⁵ At another center, hospitalists were asked to review and

identify factors contributing to their own patients' readmissions. This prompted providers to initiate process change and led to a simultaneous and sustained reduction in readmissions.¹⁶ Although uncontrolled, these studies suggest that systematic provider feedback may be beneficial.

In the current study, readmitting providers more often responded to the e-mails than discharging providers, although their ratings of nonpreventability were very similar. Simplifying the process by sending e-mails only to readmitting providers may be a reasonable approach. However, if the goal is to raise awareness and encourage clinicians to reflect on their own clinical practice or systems-based issues, then multiprovider notifications may be more valuable. We did not assess whether providers perceived benefit from these notifications (eg, prompting clinicians to change clinical practice style or address care systems) or potential negative consequences (eg, too time-consuming, feelings of guilt), which would be an important avenue of future research.

TABLE 1 Ratings of Preventability by Provider Type

| Preventability | Responses From Discharging Provider Alone, n = 63 | Responses From Readmitting Provider Alone, n = 155 | Responses From Both Providers, n = 26 | Responses From Provider On Service for Both Hospitalizations, n = 15 |
|--------------------------|---|--|---------------------------------------|--|
| Potentially avoidable, % | 19 | 13 | 31 | 33 |
| Likely unavoidable, % | 75 | 75 | 58 | 47 |
| Uncertain, % | 6 | 12 | 11 | 20 |

TABLE 2 Provider Comments Illustrating Potential Preventability in the Categories of Disease Progression, Previous Admission Complication, and New Disease Process

| Category | Etiologies | Comment |
|---------------------------------|---|--|
| Disease progression | Discharge instructions (adherence, understanding) | <ul style="list-style-type: none"> • Did not leave with migraine-specific treatment plan or did not understand plan if given. • Lack of understanding of asthma treatment at home based on history on readmission that MOC gave flovent but not albuterol when symptoms worsened. • Yes, if patient did his outpatient lung clearance and therapies. |
| | Clinical management | <ul style="list-style-type: none"> • We were overly optimistic that conservative management would work. It did not, and she is getting a procedure to address her aspiration and feeding dysfunction. • I feel that a diagnosis of asthma should have been made on his initial admission. • Readmitted because original problem was not resolved by first admission due to partial treatment. • Yes, by keeping patient hospitalized longer. |
| | Outpatient services; communication | <ul style="list-style-type: none"> • Ineffective communication among family, primary care provider, and subspecialty team on an outpatient basis. Family's misperception of the child's symptoms. • Currently we do not have a full-time cleft team nurse whose insight and training may have helped prevent this admission. • Appropriate outpatient response to mother's concerns voiced over phone and outpatient antibiotics. Urine and creatinine not tested when mother called with concerns about worsening appearance of urine. |
| Previous admission complication | Previous surgeries and procedures | <ul style="list-style-type: none"> • This patient went home with a peripherally inserted central catheter line that was not necessary for care after discharge and presented with fever in the setting of a central line. • Patient had prolonged period of being supine after surgery, leading to pressure ulcer. Given his comorbidities, he probably should have been anticipated as being at risk. • Readmission is likely related to injury to lymphatic ducts at the time of surgery. |
| New disease process | Communication; resources for outlying centers | <ul style="list-style-type: none"> • The clinic and urgent cares are not comfortable with such complex patients and frequently admit him to the pulmonary service whether he needs it or not. • Could have been taken care of in her local emergency room, but they wanted her out of their emergency room, so sent her to ours without contacting the nephrologist on call before shipping her, so we had no opportunity to discuss the patient until we heard she was in our hospital a second time in 1 month. |
| | Clinical management | <ul style="list-style-type: none"> • Patient was admitted for fecal impaction. Although this was not directly associated with her bladder surgery, her use of postoperative pain medications may have exacerbated the underlying bowel dysfunction and, if identified earlier, may have been treatable as an outpatient. |

Interestingly, when both providers responded, or when a provider who was on service for both hospitalizations responded, the perceptions more often favored avoidable readmission. The numbers, though, were low, and it is difficult to draw conclusions from these results. As one plausible explanation, the original goals of the quality improvement project and data entry process precluded assessment of interrater reliability. Specifically, we did not examine how often 2 providers disagreed. As positive responses trumped uncertain or negative responses in the data entry process, we may have overestimated preventability or the role of causal factors for readmissions rated by 2 respondents. Alternatively, the second provider may have received additional information from the first that influenced the latter's perspective. Sending e-mails to providers/stakeholders independently (rather than on the same e-mail thread) may alter the number of

respondents or the nature of responses (ie, by reducing censoring or response bias).

This study has other limitations beyond those mentioned previously. The survey instrument was designed to optimize the chance of feedback. Without more qualitative information some of the categorical responses were difficult to interpret. Given the providers' willingness to provide qualitative comments (93% of readmissions), it seems useful to include open-ended questions as part of a readmission feedback tool. We did not assess gradations of opinion through a Likert scale, or undertake a formal qualitative analysis (ie, researcher triangulation) of provider comments. This may have resulted in an inaccurate measurement of preventability or magnitude of certain factors. Finally, these single-center findings cannot be generalized to other children's hospitals or to nonacademic or community pediatric centers.

Despite these limitations, the method of notifying providers about readmissions and soliciting feedback can help identify areas for process improvement and may encourage reflective practice. The results of this project have prompted us to evaluate the content and processes around discharge instructions and education. Definitive research is needed to determine if readmission notification can decrease pediatric readmissions.

REFERENCES

1. Berry JG, Blaine K, Rogers J, et al. A framework of pediatric hospital discharge care informed by legislation, research, and practice. *JAMA Pediatr.* 2014;168(10):955–962, quiz 965–966
2. Kripalani S, Theobald CN, Anctil B, Vasilevskis EE. Reducing hospital readmission rates: current strategies and future directions. *Annu Rev Med.* 2014;65:471–485

3. Auger KA, 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
4. Bardach NS, Vittinghoff E, Asteria-Peñaloza R, et al. Measuring hospital quality using pediatric readmission and revisit rates. *Pediatrics.* 2013;132(3):429–436
5. Nakamura MM, Toomey SL, Zaslavsky AM, et al. Measuring pediatric hospital readmission rates to drive quality improvement. *Acad Pediatr.* 2014;14(suppl 5):S39–S46
6. 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). Available at: www.pediatrics.org/cgi/content/full/131/1/e171
7. Trudnak T, Kelley D, Zerzan J, Griffith K, Jiang HJ, Fairbrother GL. Medicaid admissions and readmissions: understanding the prevalence, payment, and most common diagnoses. *Health Aff (Millwood).* 2014;33(8):1337–1344
8. Lyren A, Brilli R, Bird M, Lashutka N, Muething S. Ohio Children's Hospitals' Solutions for Patient Safety: A Framework for Pediatric Patient Safety Improvement. *J Healthc Qual.* 2016;38(4):213–222
9. Auger KA, Mueller EL, Weinberg SH, et al. A validated method for identifying unplanned pediatric readmission. *J Pediatr.* 2016;170:105–12.e1, 2
10. Auger KA, Simon TD, Cooperberg D, et al. Summary of STARNet: Seamless Transitions and (Re)admissions Network. *Pediatrics.* 2015;135(1):164–175
11. 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
12. Amin D, Ford R, Ghazarian SR, Love B, Cheng TL. Parent and physician perceptions regarding preventability of pediatric readmissions. *Hosp Pediatr.* 2016;6(2):80–87
13. Gay JC, Agrawal R, Auger KA, et al. Rates and impact of potentially preventable readmissions at children's hospitals. *J Pediatr.* 2015;166(3):613–9.e5
14. 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
15. Bell H, Povilus J, Yarbrough PM. The use of an automated notification system to identify and address early readmissions by a university hospitalist service. *Hosp Pract (1995).* 2015;43(2):70–73
16. Kashiwagi DT, Burton MC, Hakim FA, et al. Reflective Practice: A Tool for Readmission Reduction. *Am J Med Qual.* 2016;31(3):265–271

Provider Feedback: A Potential Method to Reduce Readmissions

Mark S. Brittan, Victoria Fischman, Sara E. Martin, Angela Moss and David Keller

Hospital Pediatrics 2016;6;684

DOI: 10.1542/hpeds.2016-0029 originally published online October 20, 2016;

| | |
|---|--|
| Updated Information & Services | including high resolution figures, can be found at: http://hosppeds.aappublications.org/content/6/11/684 |
| Supplementary Material | Supplementary material can be found at: |
| References | This article cites 15 articles, 6 of which you can access for free at: http://hosppeds.aappublications.org/content/6/11/684#BIBL |
| Subspecialty Collections | This article, along with others on similar topics, appears in the following collection(s): Administration/Practice Management http://www.hosppeds.aappublications.org/cgi/collection/administration:practice_management_sub Continuity of Care Transition & Discharge Planning http://www.hosppeds.aappublications.org/cgi/collection/continuity_of_care_transition_-_discharge_planning_sub Hospital Medicine http://www.hosppeds.aappublications.org/cgi/collection/hospital_medicine_sub Quality Improvement http://www.hosppeds.aappublications.org/cgi/collection/quality_improvement_sub |
| Permissions & Licensing | Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://www.hosppeds.aappublications.org/site/misc/Permissions.xhtml |
| Reprints | Information about ordering reprints can be found online: http://www.hosppeds.aappublications.org/site/misc/reprints.xhtml |

Hospital Pediatrics®

AN OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Provider Feedback: A Potential Method to Reduce Readmissions

Mark S. Brittan, Victoria Fischman, Sara E. Martin, Angela Moss and David Keller

Hospital Pediatrics 2016;6;684

DOI: 10.1542/hpeds.2016-0029 originally published online October 20, 2016;

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://hosppeds.aappublications.org/content/6/11/684>

Hospital Pediatrics is an official journal of the American Academy of Pediatrics. Hospital Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2016 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

