

Comparison of Parent Report with Administrative Data to Identify Pediatric Reutilization Following Hospital Discharge

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Healthcare providers rely on historical data reported by parents to make medical decisions. The Hospital to Home Outcomes (H2O) trial assessed the effects of a one-time home nurse visit following pediatric hospitalization for common conditions. The H2O primary outcome, reutilization (hospital readmission, emergency department visit, or urgent care visit), relied on administrative data to identify reutilization events after discharge. We sought to compare parent recall of reutilization events two weeks after discharge with administrative records. Agreement was relatively high for any reutilization (κ 0.74); however,

this high agreement was driven by agreement between sources when no reutilization occurred (sources agreed 98%-99%). Agreement between sources was lower when reutilization occurred (48%-76%). Some discrepancies were related to parents misclassifying the site of care. The possibility of inaccurate parent report of reutilization has clinical implications that may be mitigated by confirmation of parent-reported data through verification with additional sources, such as electronic health record review. *Journal of Hospital Medicine* 2019;14:411-414. Published online first April 8, 2019. © 2019 Society of Hospital Medicine

Prior healthcare utilization predicts future utilization;¹ thus, providers should know when a child has had a recent healthcare visit. Healthcare providers typically obtain this information from parents and caregivers, who may not always provide accurate information.^{2,4}

The Hospital to Home Outcomes study (H2O) was a randomized controlled trial conducted to assess the effects of a one-time home nurse visit following discharge on unplanned healthcare reutilization.⁵ We assessed reutilization through two sources: parent report via a postdischarge telephone call and administrative data. In this analysis, we sought to understand differences in reutilization rates by source by comparing parent report with administrative data.

METHODS

The H2O trial included children (<18 years) hospitalized on the hospital medicine (HM) or neuroscience (Neurology/Neurosurgery) services at Cincinnati Children's Hospital Medical Center (CCHMC) from February 2015 to April 2016; they had an En-

glish-speaking parent and were discharged to home without skilled nursing care.⁶ For this analysis, we restricted the sample to children randomized to the control arm (discharge without a home visit), which reflects typical clinical care.

We used administrative data to capture 14-day reutilization (unplanned hospital readmissions, emergency department [ED] visits, or urgent care visits). CCHMC is the only pediatric admitting facility in the region and includes two pediatric EDs and five urgent care centers. We supplemented hospital data with a dataset (The Health Collaborative⁷) that included utilization at other regional facilities. Parent report was assessed via a research coordinator phone call 14-23 days after discharge. Parents were asked: "I'm going to [ask] about your child's health since [discharge date]. Has s/he been hospitalized overnight? Has s/he been taken to the Emergency Room/Emergency Department (didn't stay overnight)? Has s/he been taken to an urgent care?" We report 14-day reutilization rates by source (parent and/or administrative) and visit type.

We considered administrative data the gold standard for documentation of reutilization events for two reasons. First, all healthcare encounters generate billing and are therefore documented with verifiable coding. Second, we had access to data from our center and other regional healthcare facilities. Any parent-reported utilization to a facility not documented in either dataset was considered an unverifiable event (eg, outside our catchment region). Agreement between administrative and parent report of 14-day reutilization was summa-

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TABLE 1. Discrepancies and Agreement Indices between Parent Report and Administrative Data Documentation of Reutilization^a

Type	Parent	Administrative		Agreement			
		Yes	No	Positive (%)	Negative (%)	Overall (%)	Kappa (95% CI)
Any	Yes	48	15	76.2	97.7	95.9	0.74 (0.65, 0.83)
	No	15	645				
Hospital Readmission	Yes	19	3	74.5	99.1	98.2	0.74 (0.60, 0.87)
	No	10	691				
Emergency Department Visit	Yes	24	8 (including 3 unverifiable)	75.0	98.8	97.8	0.74 (0.62, 0.86)
	No	8	683				
Urgent Care Visit	Yes	5	6 (including 4 unverifiable)	47.6	99.2	98.5	0.47 (0.20, 0.73)
	No	5	707				

^an = 723.

alized as positive agreement (reutilization documented in both administrative and parent report), negative agreement (no reutilization reported in either administrative or parent report), and overall agreement (combination of positive and negative agreement). We classified discrepancies as reutilization events in administrative data without parent report of reutilization or vice versa. We performed medical record review of discrepancies in our institutional data.

We summarized agreement by using the Cohen’s kappa statistic by reuse type (hospital readmission, ED, and urgent care visit) and overall (any reutilization event). Strength of agreement based on the kappa statistics was classified as poor (<0.20), fair (0.21-0.40), moderate (0.41-0.60), good (0.61-0.80), and very good (0.81-1.00).⁸ We used McNemar’s test to evaluate marginal homogeneity.

RESULTS

Of 749 children randomized to the standard of care arm, 723 parents completed the 14-day follow-up call and were included in this analysis. The median child age was two years (interquartile range: 0.4, 6.9), the median length of stay (LOS) was two days (1, 3), and the majority were white (62%). Payer mix varied, with 44% privately insured and 54% publicly insured. Most patients (83%) were admitted to the HM service, and the most common diagnoses groups for index admission were respiratory (35%), neurologic (14%), and gastrointestinal (9%) diseases.

Administrative data showed 63 children with any reutilization event; parents reported 63 with any reutilization event; 48 children had events reported by both sources. The overall agreement was high, ranging from 95.9% to 98.5% (Table 1) depending on visit type. The positive agreement (ie, parent and administrative data indicated reutilization) ranged from 47.6% to 76.2%. Negative agreement (ie, parent and administrative

data agreed no reutilization) was very high, 97.7% to 99.2%. Parents reported three ED visits and four urgent care visits that were unverifiable due to lack of access to administrative data (sites of care reported were not included in our datasets).

The kappa statistics indicated good agreement between parent report and administrative data for hospital readmission, ED visit, and composite any type of reutilization but moderate agreement for urgent care visit (Table 1).

Discrepancies were noted between parent report and administrative data (Table 2). In 15 children, a parent reported no reutilization when the administrative data included one; in 15 children, a parent reported a reutilization (including seven unverifiable events) when the administrative data revealed none. However, a few discrepancies were due to the incorrect site of care report (Table 2). Chart review of discrepancies involving CCHMC locations verified the accuracy of administrative data except in one case. In this case, a child’s ED revisit appeared to be a separate encounter but actually led to a hospital readmission.

The 14-day reutilization rates by type (any, hospital readmission, ED visit, and urgent care visit) and data source (administrative data only, parent report only, and administrative or parent report) are depicted in the Appendix. Reutilization rates were similar when computed using administrative only or parent report only. However, reutilization rates increased slightly if a composite measure of any administrative data or parent report was utilized. No significant difference was found between administrative data and parent report in the marginal reuse proportions, with McNemar’s test *P* values all >.05 for hospital readmission, ED visit, and urgent care visit evaluated separately.

DISCUSSION

By comparing parent report of reutilization after hospital discharge through postdischarge phone calls with administra-

TABLE 2. Discrepancies in Recall at CCHMC

Number of Patients	Parent Report	Administrative Data
2	Hospital Readmission	No visit
7 ^a	ED Revisit	No visit
6 ^b	Urgent Care Revisit	No visit
1	ED Revisit	Hospital Readmission & Separate ED Revisit
3 ^c	Hospital Readmission	ED Revisit & Separate Hospital Readmission
1	ED Revisit	Urgent Care Revisit
1	Hospital Readmission	Urgent Care Revisit
1	No visit	ED Revisit & Separate Hospital Readmission
1	No visit	Urgent Care Revisit & Separate Hospital Readmission
7	No visit	Hospital Readmission
4	No visit	ED Revisit
2	No visit	Urgent Care Revisit

^aIncludes three unverifiable events.

^bIncludes four unverifiable events.

^cMedical record review identified administrative data inconsistency (ED revisit appeared to be a separate encounter but actually resulted in hospital readmission).

Abbreviation: CCHMC, Cincinnati Children's Hospital Medical Center; ED, emergency department.

tive data, we demonstrated high overall agreement between sources (95.9%); this finding is similar to prior research investigating the relationship between an established medical home and reutilization.⁹ However, this agreement is largely due to both sources reporting no reutilization. When revisits did occur, the agreement was notably lower, especially with regard to urgent care visits.

Discrepancies between sources have several possible explanations. First, parents may be confused by the framing of reutilization questions, perhaps lacking clarity around which visit we were referencing. Second, parents may experience limitations in health literacy^{10,11} with a lack of familiarity with healthcare language, such as the ability to delineate location types (for example, a parent may identify an urgent care visit as an ED visit, given their close proximity at our facility). Finally, our prior work identified that the "fog" of hospitalization,¹² which is often a stressful and disruptive time for families, may linger after admission and could lead to difficulty in recalling detailed events.

Our findings have implications for effective care in a complex healthcare system where parent report may be the most practical method to obtain historical information, both within clinical care and in the context of research or quality measures, such as postdischarge utilization. Given that one of the greatest risk factors for readmission is prior utilization,¹ the knowledge that a patient experienced a reutilization after a prior discharge might prompt the inpatient provider to better prepare families for subsequent transition to home.

To apply our findings practically, it is important to realize that a parent report may be sufficient when reporting that no visit occurred, if there is also no record of a visit in accessible

administrative data (such as an electronic health record). However, further questions or investigation should be considered when parents report a visit did occur or when administrative data indicate a visit occurred that the parent does not recall. Providers and researchers alike should remember to use health literacy universal precautions with all families, employing plain language without medical jargon.¹³ As linked electronic health record use becomes more prevalent, administrative data may be accessible in real-time, allowing for verification of family interview information. Administrative data beyond a single hospital system should be considered to effectively capture reutilization for research or quality efforts.

Our study has several limitations. Similar to most studies using reutilization outcomes, our data may miss a few unverifiable reuse events. By supplementing with additional regional data,⁷ we likely captured most events. Second, we did not include patients with limited English proficiency, although it is unclear how this might have biased our results. Third, while relatively few families did not complete the calls, it is possible that more discrepancies would have been noted in nonresponders. Fourth, research coordinators administering the calls followed a script to determine reutilization information; in clinical practice, a practitioner might not ask questions as clearly, which could negatively impact recall or might add clarifying follow-up questions to enhance recall. Finally, the analysis occurred in the setting of a randomized controlled trial that included children with relatively noncomplex health conditions with short LOS;⁶ thus, the results may not apply to other populations.

In conclusion, parent report and administrative data of reutilization following hospital discharge were usually in agreement

when no reutilization occurred; however, discrepancies were noted more often when reutilizations occurred and may have care implications.

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