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ORIGINAL RESEARCH

Communication and Information Deficits in Patients Discharged to Rehabilitation Facilities: An Evaluation of Five Acute Care Hospitals

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BACKGROUND: The quality of discharge documentation in patients discharged to rehabilitation centers and other subacute facilities is less well studied than that of patients discharged home.
OBJECTIVE: To evaluate the quality of information transfer among patients discharged from acute hospitals to subacute facilities across an integrated healthcare delivery system.
DESIGN: Retrospective evaluation of discharge documentation packets of selected patients.
SETTING: Five acute care hospitals of the Partners Healthcare System.
MEASUREMENTS: We measured the presence of specific data elements required to safely care for patients after discharge, including all data elements required by the Joint Commission on Accreditation of Healthcare Organizations (TJC).
RESULTS: A total of 1501 discharge documentation packets were reviewed from March 2005 through June 2007. Only 1055 (70.3%) discharge summaries had all the information required by TJC, with physical examination at admission and condition at discharge most often missing (in 11.4% and 14.2% of cases, respectively). Other deficiencies not mandated by TJC included a list of preadmission medications (missing in 20.3%) and reasons for changes in these medications at discharge (35.3%), mention of pending test results (47.2%), and postdischarge management and follow-up plans (11.1%).
CONCLUSIONS: We found room for improvement in the inclusion of data elements required for the safe transfer of patients from acute hospitals to subacute facilities, especially in areas such as medication reconciliation, pending test results, and adequate follow-up plans. ***Journal of Hospital Medicine*** **2009;4:E28–E33.** © *2009 Society of Hospital Medicine.*

KEYWORDS: patient discharge, quality indicators, rehabilitation centers.

Effective communication among physicians during the hospital discharge process is critical to patient care. Patients are at high risk of having an adverse drug event,[1] readmission, or death[2] during the transition from hospital to home.[3] Ineffective communication between inpatient and outpatient providers has been implicated as a leading cause of adverse events.[3–5] Conversely, efforts to improve communication have been shown to improve compliance with follow-up tests and decrease readmission rates.[6,7] Recently, the absence of several specific data elements in discharge documentation have been shown to be common and to have potential for patient harm, including test results that are pending at the time of discharge.[8,9] Unexplained discrepancies between preadmission and discharge medication regimens are also common and potentially dangerous.[1]

According to the Joint Commission for Accreditation of Healthcare Organizations (TJC), the following elements should be included in discharge summaries: "the reason for hospitalization; significant findings; procedures performed and care, treatment, and services provided; the patient's condition at discharge; and information provided to the patient and family, as appropriate."[10] TJC also advocates medication reconciliation, "a process of identifying the most accurate list of all medications a patient is taking—including name, dosage, frequency, and route—and using this list to provide correct medications for patients anywhere within the health care system."[11]

Despite the importance of complete communication among providers at hospital discharge, a recent systematic review showed that discharge summaries often lacked important information such as diagnostic test results (missing from 33%-63%), treatment or hospital course (7%-22%), discharge medications (2%-40%), test results pending at discharge (65%), patient or family counseling (90%-92%), and follow-up plans (2%-43%).[1]

Most of the studies addressing this issue have evaluated communication pitfalls between acute care hospitals and primary care physicians among patients discharged home.[1–7] In contrast, the quality of discharge documentation among patients discharged to rehabilitation centers and other subacute care facilities has been less well studied, perhaps due to relatively smaller numbers of patients discharged to such facilities. This communication is as or more important because these patients are potentially more vulnerable and

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their medical conditions more active than for patients discharged home.[12] Furthermore, discharge information from acute care hospitals will often form the basis for admission orders at subacute facilities. Last, these patients will have a second transition in care (from subacute facility to home) whose quality is dependent at least in part on the quality of communication during the first transition.

The aim of this study was to evaluate the quality of information transfer among patients discharged from acute hospitals to subacute facilities across an integrated healthcare delivery system. The long-term goals of this effort were to determine the areas most in need of improvement, to guide interventions to address these problems, and to track improvements in these measures over time as interventions are implemented and refined.

Methods

This observational study was conducted as part of a quality improvement project evaluating the quality of information provided during the discharge process across Partners Health Care System. The institutional review boards of the participating institutions approved the study.

Study Sample

We evaluated a sample of discharge documentation packets (eg, discharge summaries, discharge orders, nursing instructions, care coordination, and physical/occupational therapy notes) of patients discharged from all 5 acute care hospitals of the Partners Healthcare System to 30 subacute facilities (rehabilitation hospitals and skilled nursing facilities) from March 2005 through June 2007.

For reviewers at acute sites, discharge documentation packets were randomly selected each quarter using a random number generator within Microsoft Excel (Microsoft, Redmond, WA). At subacute sites, reviewers selected which packets to review, although they were encouraged to review all of them. Random selection of packets could not be achieved at subacute sites because reviews took place on the day of admission to the subacute facility. All reviewers received 1 hour of training on how to evaluate discharge packets, including review of a standardized teaching packet with 1 of the coauthors (J.L.S. or T.O.).

Two of the 5 acute care hospitals in the study are academic medical centers and the other 3 are community hospitals. Reviewers were a mix of trained medical residents or nurse practitioners at acute sites and admitting physicians or nurse practitioners at receiving subacute sites.

Fifty packets were reviewed per acute site per quarter. This provided roughly 10% precision around our estimates (ie, if compliance with a measure were 80%, the 95% confidence interval around this estimate would be 70%-90%). This sample size is consistent with those used to obtain other national benchmarks, such as those for National Hospital Quality Measures, which generally require at least 35 cases per quarter.[13]

TABLE 1. Measured Data Elements at Discharge

	Reason(s) for Admission
Joint Commission requirements	A focused history
	A focused physical exam
	Pertinent past medical history
	Treatment rendered
	Discharge diagnosis(es)
	Condition on discharge
	Discharge summary
	Any information missing
Non-Joint Commission requirements	
Medication information	Discharge medications
	Drug allergies
	Preadmission medication information
	Explanation for any differences between preadmission and discharge medications
Test results information	Latest pertinent laboratory results
	Pertinent radiology results
	Test results pending at time of transfer
Overall assessment	Were management and follow-up plans adequately described?
	Did you uncover a significant condition not mentioned in the discharge packet?

Measures

A multidisciplinary team at Partners derived, reviewed, and refined a "minimum data set" required to appropriately care for patients during the first 72 hours after transfer from an acute care hospital to a subacute facility. Several of these measures are required by TJC. Other measures were either modifications of TJC measures made to facilitate uniform data collection (eg, "history" and "physical examination" at admission instead of "significant findings") or additional data elements (not required by TJC) felt to be important to patient care based on the medical literature and interviews with receiving providers at subacute facilities. All measures were refined by the multidisciplinary team with input from additional subspecialists as needed (see Table 1 for the final list of measures).

Data Collection

After reviewing the entire discharge documentation packet, reviewers completed a survey concerning the inclusion of the required data elements. Surveys were completed online using Perseus Survey Solutions 6.0 (Perseus Development Corp., Braintree, MA) in the month following discharge (for reviewers at acute care sites) or within 24 hours of admission to the subacute facility (for reviewers at subacute sites). To verify the accuracy and completeness of packets, reviewers at acute sites were instructed to compare the discharge documentation to a review of the inpatient medical record. Similarly, reviewers at subacute sites were instructed to complete their evaluations after admitting each patient to their facility.

Outcomes

The primary outcome was the proportion of packets that contained each data element. In addition, we calculated the

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TABLE 2. Inclusion of Discharge Data Elements

	Sample Size	Missing [n (%)]	95% CI Missing %
Joint Commission requirements			
Reason(s) for admission	1497	14 (0.9)	0.4–1.4
A focused history	1493	65 (4.4)	3.3–5.3
A focused physical exam	1493	170 (11.4)	9.7–13
Pertinent past medical history	1494	69 (4.6)	3.5–5.6
Treatment rendered	1494	33 (2.2)	1.4–2.9
Discharge diagnosis(es)	1480	53 (3.6)	2.6–4.5
Condition on discharge	1462	208 (14.2)	12.4–16.0
Discharge summary	1475	90 (6.1)	4.8–7.3
Any information missing	1501	447 (29.7)	27.4–32.0
Non-Joint Commission requirements			
Medication information			
Discharge medications	1491	19 (1.3)	0.7–1.8
Drug allergies	1470	88 (6.0)	4.7–7.2
Preadmission medication information	1460	297 (20.3)	18.3–22.4
Explanation for any differences between preadmission and discharge medications	1060	374 (35.3)	32.0–38.1
Test results information			
Latest pertinent lab results	1460	261 (17.9)	15.9–19.8
Pertinent radiology results	1303	139 (10.7)	9–12.4
Test results pending at time of transfer	341	160 (47.2)	41.9–52.5
Overall assessment			
Were management and follow-up plans adequately described?	1461	No (%): 161 (11.1)	95% CI No %: 9.5–12.7
Did you uncover a significant condition not mentioned in the discharge packet?	1469	Yes (%): 162 (11.0)	95% CI Yes %: 9.4–13.0
All applicable elements present	1501	503 (33.5)	31.1–35.9

Abbreviation: CI, confidence interval.

proportion of packets that contained all applicable elements required by TJC and all applicable data elements measured in the study. Last, we evaluated two global (albeit subjective) measures of satisfaction with the packet: "Were management and follow-up plans adequately described?" (both components needed to be adequately described to get credit for this question) and "Did you uncover a significant condition not mentioned in the discharge packet?" Significant conditions were defined as active medical problems requiring management during or immediately following the hospitalization.

Statistical Analysis

Results were calculated as proportions, odds ratios, and 95% confidence intervals (CI), using SAS version 9.1 (SAS Institute, Inc., Cary, NC). Simple logistic regression was used to compare inclusion of data elements between medical and surgical services and between academic medical centers and community hospitals. To evaluate interrater reliability, 2 reviewers (both at acute sites) independently evaluated 29 randomly chosen charts, each with 12 data elements.

Results

A total of 1501 discharge documentation packets were reviewed, including 980 patients (65%) from a medical unit and 521 patients (35%) from a surgical unit. Based on 2007 data, these packets represent approximately 4% of all eligible discharges to subacute facilities. Patients discharged from 1 of the 2 academic medical centers represented 44% of the sample. A total of 644 discharge packets (43%) were reviewed at acute sites and 814 packets (54%) were reviewed at subacute sites. Information about reviewer site was missing in 43 discharge packets (3%). For the 29 charts independently reviewed by 2 reviewers, there was complete agreement for 331 out of 348 data elements (95.1%).

Only 1055 (70%) discharge summaries had all the information required by TJC (Table 2). Physical examination at admission (a component of "significant findings," as noted above) and condition at discharge were the 2 elements most often missing. The defect-free rate varied by site, with a range of 61% to 76% across the 5 acute care hospitals (data not shown).

The rates of inclusion of other (non-TJC required) data elements are shown in Table 2. Most often missing were preadmission medication regimens, any documented reason for any difference between preadmission and discharge medications, pertinent laboratory results, and an adequate follow-up plan (including who to follow up with, when to follow-up, and a list of tasks to be accomplished at the follow-up visit). Notation regarding significant test results that were pending at the time of transfer was missing in 160 of 341 applicable patients (47%), and in 162 patients (11%), physicians uncovered a significant condition that was not

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mentioned in the discharge documentation. Only 503 (33.5%) discharge documentation packets had all applicable measures present. In addition, the discharge summary was not received at all on the day of discharge according to the receiving site in 90 patients (6%).

Reviewers were asked in a separate question which missing data were necessary for patient care. Data elements most often cited were explanations for any medication discrepancies and test results pending at the time of the hospital discharge.

Community hospitals had a higher rate of inclusion of TJC-required data elements when compared to academic medical centers (Table 3). Also, among non-TJC required data elements, inclusion rates were higher among the community hospitals, especially regarding information about medication discrepancies, pending test results, and follow-up information (Table 3).

Although no differences were found between medical and surgical services regarding compliance with TJC requirements, a difference was noted in documentation of explanations of medication discrepancies and pending test results, with medical services performing better in both measures (Table 3).

In general, reviewers at subacute sites more often evaluated packets as deficient than reviewers at acute sites, up to an absolute difference of 33% in the proportion of missing data, depending on the data element (see Appendix, Table 1).

TABLE 3. Completeness of Discharge Documentation by Site and Service

	Total (n)	All Elements Present [n (%)]	OR (95% CI)
Joint Commission requirements			
Hospital type			
Community hospitals	949	826 (87)	2.7 (2.1–3.6)
Academic medical centers	541	384 (71)	Ref.
Service			
Medical services	1013	745 (73)	1.3 (1.0–1.7)
Surgical services	488	332 (68)	Ref.
Explanation for any medication discrepancies		Yes [n (%)]	
Hospital type			
Community hospitals	718	550 (76)	5.0 (3.8–6.5)
Academic medical centers	342	136 (39)	Ref.
Service			
Medical services	754	529 (70)	2.2 (1.7–2.9)
Surgical services	306	157 (51)	Ref.
Test results pending at time of transfer		Yes [n (%)]	
Hospital type			
Community hospitals	172	109 (63)	2.4 (1.5–3.7)
Academic medical centers	169	71 (42)	Ref.
Service			
Medical services	227	146 (64)	4.2 (2.6–6.9)
Surgical services	114	34 (30)	Ref.
Follow-up plans adequately described		Yes [n (%)]	
Hospital type			
Community hospitals	968	883 (91)	1.7 (1.2–2.4)
Academic medical centers	543	466 (85)	Ref.
Service			
Medical services	983	862 (87)	0.67 (0.5–1.0)
Surgical services	478	437 (91)	Ref.

Abbreviations: CI, confidence interval; OR, odds ratio.

Discussion

Our study evaluated the completeness of documentation in the discharge summaries of patients discharged from acute care to subacute care facilities. Our results for the inclusion of TJC-required data elements were similar to those quoted in the literature for patients discharged home.[6] Our results also demonstrated a high rate of other missing data elements that are arguably of equal or greater importance, including reasons for discrepancies between preadmission and discharge medication regimens and tests that are pending at the time of discharge.[1,8,9] Our results also demonstrated the relatively poorer performance of academic centers compared to community hospitals regarding inclusion of information about medication reconciliation, follow-up, pending test results, and complete information required by TJC. Finally, we found that patients discharged from surgical services more often lacked documentation of medication discrepancies and pending test results compared with patients from medical services.

To our knowledge, this is one of the first studies looking at the quality of information transfer in patients discharged to subacute care facilities. The results of this study are not surprising given the known problems with general information transfer at hospital discharge.[1] The fact that community hospitals provided more complete information than academic medical centers for certain data elements may be due to the difference between residents and more senior physicians preparing discharge documentation. Such differences could reflect differences in experience, training, and degree of appreciation for the importance of discharge documentation, and/or restrictions in work hours among residents (eg, resulting in time-pressure to complete discharge summaries and/or summaries being written by residents who know the patients less well). These hypotheses deserve further exploration. The differences between medical and surgical services should also be validated and explored in other healthcare systems, including both academic and community settings.

The results of this study should be viewed in light of the study's limitations. Packets evaluated by reviewers at subacute facilities were chosen by the reviewers and may not have been representative of all patients received by that facility (in contrast to those reviewed at the acute sites, which were chosen at random and more likely to be representative, although we did not formally test for this). It is possible that reviewers at subacute sites selected the worst discharge documentation packets for evaluation. Second, evaluations by reviewers at subacute sites did not distinguish between information missing from discharge documentation and failure to receive the documentation at all from the acute care hospital (again in contrast to reviewers at acute sites, who always had access to the documentation). Lastly, reviewers at acute and subacute sites may have graded packets differently due to their different clinical perspectives. These 3

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factors may explain the relatively poorer results of discharge packets reviewed by reviewers at subacute sites. Further study would be needed to distinguish among these possibilities (eg, having acute and subacute reviewers answer the same questions for the same discharge packets to allow us to measure interrater reliability between the different kinds of reviewers; explicitly asking subacute reviewers about receipt of each piece of documentation; comparing the distribution of diagnosis-related group [DRG] codes and hospital length of stay in evaluated vs. total discharge packets as a measure of representativeness). We also cannot rule out the possibility of reviewer bias, but all reviewers were trained in a standardized fashion and we know that reliability of assessments were high, at least among reviewers at acute sites. Last, we did not measure actual or potential adverse events caused by these information deficits.

As part of a Partners-wide initiative to improve transitions in care, the results were presented to the administrations of each of the 5 acute care hospitals. The Partners High Performance Medicine Transition team then began work with a steering committee (composed of representatives from each hospital) to address these deficiencies. Since then, the hospitals have taken several steps to improve the quality of information transfer for discharged patients, including the following:

1. Technological improvements to the hospitals' discharge ordering systems to actively solicit and/or autoimport the required information into discharge documentation.
2. Creation of discharge templates to record the required information on paper.
3. Provision of feedback to clinicians and their service chiefs regarding the ongoing quality of their discharge documentation.
4. Creation of an online Partners-wide curriculum on discharge summary authorship, with a mandatory quiz to be taken by all incoming clinicians.

In conclusion, we found room for improvement in the inclusion of data elements required for the safe transfer of patients from acute hospitals to subacute facilities, especially in areas such as medication reconciliation, pending test results, and adequate follow-up plans. We also found variation by site and type of service. For patients discharged to rehabilitation and other subacute facilities, improvement is needed in the communication of clinically relevant information to those providing continuing care.

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Appendix

TABLE 1. Differences in evaluation scores between reviewers at acute and Sub-Acute Sites

	Reviews from Sub-Acute Sites (N = 814)*				Reviews from Acute Sites (N = 644)*			
JCAHO Indicators	**Sample Size**	**Missing N**	**%**	**95% CI**	**Sample Size**	**Missing**	**%**	**95% CI**
Reason(s) for admission	812	9	1.1	0.4–1.8	643	4	0.6	0.01–1.2
A focused history	810	49	6.1	4.4–7.7	642	16	2.5	1.3–3.7
A focused physical exam	810	131	16.2	13.7–18.7	641	34	5.3	3.6–7.0
Pertinent past medical history	810	50	6.2	4.5–7.8	642	14	22.0	1.1–3.3
Treatment rendered	811	29	3.6	2.3–4.9	641	4	0.6	0.01–1.2
Discharge diagnosis(es)	806	59	7.3	5.5–9.1	630	7	1.1	0.3–1.9
Condition on discharge	800	92	11.5	9.3–13.7	622	109	17.5	14.5–20.5
Discharge summary	809	77	9.5	7.5–11.5	624	11	1.8	0.7–2.8
Any information missing								
Medication Information	**Sample Size**	**Missing**	**%**	**95% CI**	**Sample Size**	**Missing**	**%**	**95% CI**
Discharge medications	811	12	1.5	0.7–2.3	638	6	0.9	0.2–1.7
Drug allergies	811	47	5.8	4.2–7.4	639	35	5.5	3.7–7.2
Explanation for any differences between preadmission and discharge medications	542	275	50.7	46.5–55	498	88	17.7	14.3–21.0
Test results information	**Sample Size**	**Missing**	**%**	**95% CI**	**Sample Size**	**Missing**	**%**	**95% CI**
Latest pertinent lab results	790	178	22.5	19.6–25.4	629	73	11.6	9.1–14.1
Pertinent radiology results	668	110	16.5	13.7–19.3	601	27	4.5	2.8–6.2
Test results pending at time of transfer	183	87	47.5	40.3–54.8	152	73	48.0	40.1–56.0
Management Information	**Sample Size**	**No**	**%**	**95% CI**	**Sample Size**	**No**	**%**	**95% CI**
Were management and follow-up plans adequately described?	794	121	15.2	12.7–17.7	631	79	12.5	9.9–15.1
	Sample Size	**Yes**	**%**	**95% CI**	**Sample Size**	**Yes**	**%**	**95% CI**
Did you uncover a significant condition not mentioned in the discharge packet?	793	117	14.8	12.3–17.2	635	38	6.0	4.4–7.8

*Information about the reviewer was missing in 43 cases

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