Hospitalized Patients' Understanding of Their Plan of Care

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OBJECTIVE: To evaluate hospitalized patients' understanding of their plan of care.

PATIENTS AND METHODS: Interviews of a cross-sectional sample of hospitalized patients and their physicians were conducted from June 6 through June 26, 2008. Patients were asked whether they knew the name of the physician and nurse responsible for their care and specific questions about 6 aspects of the plan of care for the day (primary diagnosis, planned tests, planned procedures, medication changes, physician services consulted, and the expected length of stay). Physicians were interviewed and asked about the plan of care in the same fashion as for the patients. Two board-certified internists reviewed responses and rated patient-physician agreement on each aspect of the plan of care as none, partial, or complete agreement.

RESULTS: Of 250 eligible patients, 241 (96%) agreed to be interviewed. A total of 233 (97%) of 241 physicians completed the interview, although sample sizes vary because of missing data elements. Of 239 patients, 77 (32%) correctly named at least 1 of their hospital physicians, and 143 patients (60%) correctly named their nurses. For each aspect of care, patients and physicians lacked agreement on the plan of care in a large number of instances. Specifically, there was no agreement between patients and physicians on planned tests or procedures for the day in 87 (38%) of 229 instances and in 22 (10%) of 220 instances. Complete agreement on the anticipated length of stay occurred in only 85 (39%) of 218 instances.

CONCLUSION: A substantial portion of hospitalized patients do not understand their plan of care. Patients' limited understanding of their plan of care may adversely affect their ability to provide informed consent for hospital treatments and to assume their own care after discharge.

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High-quality communication between health care professionals and their patients is fundamental in ensuring comprehension and in providing effective care. Studies in ambulatory settings document that agreement between patients and physicians regarding the diagnosis and treatment plan is associated with improved medication adherence and better outcomes.¹⁻⁴ Hospital settings present unique challenges to the patient-physician relationship, including the lack of a prior relationship, rapid pace of clinical care, and dynamic nature of inpatient medical teams. Prior studies revealed important findings about the relationship between hospitalized patients and health care professionals. Most hospitalized patients are unable to correctly identify their physicians or nurses,⁵⁻⁸ and patients in teaching hospitals have difficulty understanding their physicians' level of training.^{7,9,10} At hospital discharge, patients are frequently unable to list their

diagnoses and the names, purpose, and adverse effects of medications.^{11,12} Moreover, physicians frequently overestimate patients' understanding of the treatment plan at hospital discharge¹¹ and may not recognize patients with low health literacy.¹³

Although deficits in patients' understanding of the plan of care in the ambulatory setting and at hospital discharge are well documented, no studies have evaluated patients' understanding of their plan of care *during* hospitalization. Yet, case studies clearly demonstrate the hazards patients may encounter when they do not fully comprehend their diagnostic and treatment plan in the hospital.^{14,15} We hypothesized that disagreement between patients and their physicians on the plan of care might be present early in the hospital stay. We sought to characterize patients' understanding of their plan of care during hospitalization and factors associated with improved understanding.

PATIENTS AND METHODS

We conducted interviews of a cross-sectional sample of patients and their physicians from June 6 through June 26, 2008. Each weekday during the study period, patients admitted to general medical services and their physicians were interviewed in the afternoon of the patient's second hospital day. Patients were randomly selected from daily hospital census reports for inclusion in the study using a random number generator.

The study was conducted at an 897-bed, academic, not-for-profit, urban hospital. The study was approved by the Northwestern University Institutional Review Board. Hospital units consisted of 30 beds and were staffed by 1 of 2 physician services: a house staff-covered teaching service or a non-house staff hospitalist service. Each teaching service unit was staffed by 3 teaching service physician teams who cared for patients solely on their designated

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unit. Teaching service teams consisted of 1 attending physician, 1 second- or third-year resident, 1 to 2 interns, and 1 to 2 students. Each hospitalist service unit was staffed by 3 hospitalists. Hospitalists cared for patients without the assistance of house staff or midlevel professionals (nurse practitioners or physician assistants). Patients were admitted to these units based solely on bed availability, either from the emergency department or directly by an outpatient physician.

INTERVIEWS OF PATIENTS AND PHYSICIANS

We created a structured interview instrument designed to characterize patients' knowledge of the names and roles of their health care professionals and understanding of their plan of care. We first conducted pilot interviews and made modifications based on feedback from participants. Standardized interviews of patients and physicians were then conducted by 1 of 3 research assistants on patients' second hospital day (eAppendix 1 and 2 online linked to this article). Two of the research assistants (K.J.H. and J.J.) were second-year medical students with prior clinical research experience using interviews. The third research assistant (K.M.E.) was an undergraduate student who received 2 days of training specifically for this study. Patients who were unable to speak and/or understand English were excluded. Patients disoriented to person, place, or time were also excluded. On the basis of the duration of pilot interviews, we set a goal for obtaining a convenience sample of 240 patients for the study period.

Patients were asked whether they knew the name of the physician(s) and nurse primarily responsible for their care. Patients were then asked specific questions about the following 6 aspects of their plan of care for the day: the primary diagnosis, planned tests, planned procedures, medication changes, physician services consulted, and the expected length of stay. Patients' responses to questions about the plan of care were recorded verbatim by the research assistants.

Patients' primary service physicians were interviewed and asked about aspects of the daily plan of care for the patient in the same fashion as for the patients. For patients admitted to the teaching service, we interviewed the intern. For patients admitted to the hospitalist service, we interviewed the hospitalist. We designated these physicians to be interviewed because they were primarily responsible for patient-physician communication in the hospital. Because the study was performed late in the academic year, no medical students were performing sub-internships during the study period.

To minimize confounding due to evolving plans of care and various levels of physician training, all interviews were conducted during the afternoon of patients'

second hospital day. This ensured that house staff physicians were interviewed after their supervising attending physician had made rounds with the team and discussed the plan of care for patients admitted the previous day. In addition, we made an effort to conduct interviews of patients and their physicians in temporal proximity to one another.

PHYSICIAN REVIEW FOR AGREEMENT ON THE PLAN OF CARE

Two board-certified internists (M.P.L. and N.K.) reviewed patient and physician responses and rated patient-physician agreement on each aspect of the plan of care as no agreement, partial agreement, or complete agreement. For example, if the patient responded that the main diagnosis was fainting and the physician responded that it was syncope, complete agreement was given for that aspect of care (primary diagnosis). If the patient responded that the planned testing for the day included only ultrasonography of the legs and the physician responded that the plan was for the patient to undergo a lower-extremity venous duplex study and chest computed tomography, partial agreement was given. If the patient responded that he or she did not know the plan, the aspect of care was coded as having no agreement between the patient and physician. For anticipated length of stay, we defined complete agreement as an exact match between the patient and physician, partial agreement as a difference of 1 day, and no agreement as a difference of more than 1 day. We calculated a patient-physician summary agreement score by assigning 0, 1, or 2 points for no agreement, partial agreement, and complete agreement, respectively, to each of the 6 aspects of the plan of care. To assess interrater reliability, approximately 30% of participant responses underwent duplicate review.

STATISTICAL ANALYSES

Demographic data on patients and physicians were obtained from administrative databases and complemented information from interviews. We report the number and percentage of patients who correctly identified the nurse assigned to care for them that day and at least 1 of the hospital physicians on their primary team and their role(s). We also report the number and percentage of patient-physician pairs who agreed on specific aspects of the plan of care. We evaluated differences in the patient-physician summary agreement score on the basis of patient sex, ethnicity, and education level and physician sex, ethnicity, and service using the Mann-Whitney test and Kruskal-Wallis test. We explored associations between the patient-physician summary agreement score and patient and physician age using the Spearman rank correlation. We assessed interrater reliability on the plan

of care using the weighted κ statistic. All analyses were conducted using Stata statistical software, version 10.0 (College Station, TX).

RESULTS

We identified 294 patients to participate in the study. Twenty-two patients were discharged before we approached them for interview. Sixteen were ineligible to participate because of cognitive impairment or inability to speak English. Six patients were unavailable to be interviewed because they were undergoing testing or procedures. Of the 250 eligible patients, 241 (96%) agreed to be interviewed. Of the 241 physicians, 233 (97%) completed the interview. Individual physicians may have been interviewed multiple times given that many of their patients may have been enrolled in the study. Physicians completed 1 to 14 interviews (median, 6; interquartile range, 3-7), and a total of 44 different physicians were interviewed. Three-quarters of patient and physicians interviews were conducted within 2.5 hours of one another.

Participant characteristics are summarized in Table 1. Patients' payer mix was as follows: Medicare, 113 (49%); private, 68 (29%); Medicaid, 29 (12%); self-pay, 20 (9%); and other, 2 (1%). Of 241 patients, 203 (84%) were admitted via the emergency department, and 119 (50%) were admitted at night. Of 241 patients, 101 (42%) were admitted to the teaching service, whereas 140 (58%) were admitted to the hospitalist service.

PATIENTS' KNOWLEDGE OF THE NAMES AND ROLES OF THEIR HEALTH CARE PROFESSIONALS

Of 239 patients, 77 (32%) correctly named at least 1 of their hospital physicians, and 27 (11%) correctly named their physician's role. Patients' ability to correctly identify 1 or more of their physicians did not differ whether they were cared for on the teaching service or on the hospitalist service. A total of 143 patients (60%) correctly named their nurses.

TABLE 1. Characteristics of Study Participants^a

Characteristic	No. (%) of patients (n=241)	No. (%) of physicians (n=44)
Age (y), mean $\pm$ SD	58.5 $\pm$ 18.5	30.9 $\pm$ 3.9
Women	133 (55)	26 (59)
Ethnicity		
White	129 (54)	26 (59)
Black	91 (38)	2 (5)
Hispanic or Latino	7 (3)	0 (0)
Asian	5 (2)	16 (36)
Other	7 (3)	0 (0)
Education level		
Less than high school	33 (14)	NA
High school graduate	116 (50)	NA
College graduate	51 (22)	NA
Advanced degree graduate	34 (15)	NA
Have primary care physician	194 (82)	NA
Hospital service		
Teaching service	101 (42)	NA
Hospitalist service	140 (58)	NA

^a Due to missing data, the number of patients with data available for a given characteristic varies from 234 to 241. NA = not applicable.

PATIENTS' UNDERSTANDING OF THEIR PLAN OF CARE

Across all aspects, few patients indicated that they did not know their plan of care for the day. Specifically, 2 patients (1%) indicated that they did not know their diagnosis; 5 (2%) and 3 (1%) did not know their planned tests or procedures, respectively; 12 (5%) did not know whether medication changes were planned; and 8 (3%) did not know if consulting physicians were planning to see them. Many more patients (77 [32%]) indicated that they did not know when they would be discharged from the hospital.

Despite patients' strong perception of understanding, they were not in agreement with their physicians on aspects of the plan of care in a large number of instances. As indicated in Table 2, there was no agreement between patients and physicians on planned tests or procedures for the day in 87 (38%) of 229 instances and in 22 (10%) of 220 instances, respectively. There was no agreement between patients and their physicians on planned medication

TABLE 2. Agreement Between Patients and Physicians on Aspects of the Plan of Care

Aspect of care	No. of occurrences/total No. of occurrences (%) ^a		
	No agreement	Partial agreement	Complete agreement
Primary diagnosis	83/230 (36)	43/226 (19)	104/231 (45)
Planned tests	87/231 (38)	23/230 (10)	121/233 (52)
Planned procedures	22/231 (10)	0/0 (0)	209/232 (90)
Medication changes	127/233 (54)	16/229 (7)	90/231 (39)
Physician consultations	105/233 (45)	17/243 (7)	111/231 (48)
Anticipated length of stay ^b	96/218 (44)	37/218 (17)	85/218 (39)

^a Sample sizes vary from 218 to 233 because of missing data elements.

^b Length of stay agreement was rated as follows: none, 1-day difference or longer; partial, 1-day difference; and complete, no difference (exact match).

TABLE 3. Examples of Patient-Physician Disagreement

Aspect of care	Type of physician service	Patient's response	Physician's response	Potential issue
Diagnosis	Hospitalist	Fast heart beat	Lung cancer	Limited understanding of underlying cause of symptoms
Diagnosis	Hospitalist	Prostate cancer	Palpitations, arrhythmia evaluation	Incorrect attribution of symptoms to prior diagnosis
Tests	Teaching	None	MRI of the foot, venous and arterial Doppler ultrasonography of lower extremities	No understanding of diagnostic plan
Tests	Teaching	CT	None	Faulty expectations
Procedures	Hospitalist	None	Cardioversion	Unaware that a procedure with potential risk has been planned
Procedures	Teaching	Upper endoscopy	None	Faulty expectations
Medication changes	Teaching	None	Cyclosporine administered	Lack of understanding of treatment plan and potential risk and benefits of treatment
Medication changes	Hospitalist	None	Warfarin administered	Lack of understanding that a long-term medication with potential adverse effects has been administered
Consultations	Teaching	Gynecology	Orthopedic surgery	Faulty expectations
Consultations	Teaching	None	Palliative care	Limited preparedness and/or understanding of departure from initial goals of care

CT = computed tomography; MRI = magnetic resonance imaging.

changes for the day in 127 (54%) of 235 instances. Complete agreement on the anticipated length of stay occurred in only 85 (39%) of 218 instances. When patients and physicians disagreed on the expected discharge date, more patients expected to be discharged sooner than their physician intended (43/56 [77%]) than later than their physician intended (13/56 [23%]). Interrater reliability between the internists in their rating of patient-physician agreement on aspects of the plan of care was very good (weighted κ range, 0.8-1.0).

No association was found between patient or physician age and the patient-physician summary agreement score. No differences were seen in the patient-physician summary agreement score based on patient sex, ethnicity, or education level or physician sex or ethnicity. Patients who were able to correctly identify 1 or more of their physicians were more likely to have a higher patient-physician summary agreement score (mean $\pm$ SD, 7.37 $\pm$ 2.42 vs 6.74 $\pm$ 2.43; $P=.06$). Patients treated by the hospitalist service had a significantly higher patient-physician summary agreement score compared with patients admitted to the teaching service (mean $\pm$ SD, 7.30 $\pm$ 2.44 vs 6.34 $\pm$ 2.47; $P=.007$). This difference was mainly due to better agreement between patients and their physicians on planned procedures for the day and expected length of stay. Specifically, there was complete agreement between the patient and physician on planned procedures for the day for 128 (96%) of 134 hospitalist service patients compared with 81 (84%) of 97 patients treated by the teaching service ($P=.002$). Similarly, there was complete patient-physician agreement on the expected length of stay for 66 (50%) of 132 hospitalist service patients compared with 31 (32%) of 97 teaching service patients ($P=.02$).

EXAMPLES OF PATIENT-PHYSICIAN DISAGREEMENT

Examples of patient-physician disagreement on aspects of the plan of care are given in Table 3. Examples revealed serious potential consequences of disagreement, including patients' erroneous understanding of the nature of their presenting symptoms, severely limited understanding of diagnostic and/or therapeutic plans, faulty expectations, and lack of knowledge that medications with potential adverse effects had been administered.

DISCUSSION

We found that a substantial portion of hospitalized patients do not understand their plan of care. Several potential explanations exist for patients' incomplete understanding of the plan of care. Physicians in our study may not have adequately engaged patients in discussions about the plan because of time constraints or perceptions about patients' level of understanding or capacity to understand the plan. Physicians also may not have tested their patients' understanding of the care plan. A study of outpatient clinical encounters found that physicians frequently fail to assess patients' degree of understanding.¹⁶ Interestingly, patients in our study seemed to overestimate their own understanding. Only a small portion of patients indicated in the interviews that they did not know the plan of care for the day. Our finding that the patient-physician summary agreement score was higher for patients in the hospitalist service may reflect more mature communication skills on the part of hospitalists. Alternatively, the larger number of physicians caring for patients in the teaching service (1 attending, 1 resident, and 1-2 interns) may have resulted in a less unified patient-physician discussion.

In ambulatory settings, patients' understanding of their treatment plan is highly predictive of self-management behaviors,^{17,18} and agreement between a patient and his or her physician has been associated with improved medication adherence and better outcomes.¹⁻⁴ Experts have advocated for a shift in patient-physician relationships from a directive style to a more collaborative interaction.¹⁹⁻²¹ This *shared decision-making* model elicits patient preferences and emphasizes the patient's understanding of the risks and benefits of diagnostic and therapeutic decisions, alternatives, and uncertainties.²¹ Because the patient-physician relationship is a partnership in the shared decision-making model, both parties share authority and responsibility in a therapeutic alliance. Research shows that, given the opportunity, most hospitalized patients wish to participate in routine aspects of medical decision making.²²

An important implication of our findings relates to informed consent. Although often considered pertinent only to invasive procedures, the principles of medical informed consent apply to any treatment that carries risk, including the prescription of medications with serious potential adverse effects, as well as the initiation of diagnostic evaluations that may lead to additional testing and/or invasive procedures.^{16,23-25} The examples of patient-physician disagreement in our study suggest that the principles of informed consent were inconsistently applied when commencing treatments with potential risk.

To complement improvements in the patient-physician relationship, educational initiatives could be used during patients' hospitalizations. Initiatives might include multimedia health education tools and visits from pharmacists and trained health educators. A recent time-motion study of hospitalized patients found that 71% of patient time was classified as downtime and that 80% were interested in participating in health education activities during hospitalization.²⁶ Improving patients' understanding of their care plan by using a shared decision-making model and other health education activities throughout their hospitalization may better prepare patients to assume their own care after discharge.

Although 68% of our study patients were unable to correctly identify their physician, 60% were able to correctly identify their nurse. Prior research has consistently demonstrated patients' difficulty in identifying their physicians.⁶⁻⁸ Nurses have similar barriers in communicating with patients, including the lack of a prior relationship and frequent changes in patient assignment as a result of working in shifts. Yet, nurses in our study were able to overcome these barriers and succeeded in familiarizing patients with their names and roles. Francis et al⁵ demonstrated an improvement in patients' ability to identify their physicians and improved patient satisfaction by

placing photographs of physicians in patients' rooms. Therefore, we believe efforts to improve patients' familiarity with their hospital physicians can be successful and will complement other efforts to improve patient-physician communication.

Our study has several limitations. First, it consisted of patients in a general medical service and their physicians at a single hospital. Patients' understanding of their plan of care may differ among hospitals and hospital services. Second, some of the disagreement between patients and their physicians was possibly a result of rapidly evolving plans of care. Interviewing patients and their physicians in the afternoon of the second hospital stay should have provided enough time for plans to be established and communicated with patients. We also made an effort to interview patients and their physicians in temporal proximity with one another. A third potential limitation is our focus on the technical aspects of the plan of care. Future research should also assess whether patients and their physicians agree on symptom assessment and management.

CONCLUSION

Physicians should be aware that hospitalized patients frequently do not understand aspects of their plan of care. Improvement of patients' understanding is essential for patients to provide informed consent for hospital treatments and may better prepare patients to assume their own care after discharge. Efforts should be made to improve hospitalized patients' understanding of their care plan by using a shared decision-making model and health education activities throughout their hospitalization.

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