

Underutilized Time for Health Education of Hospitalized Patients

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BACKGROUND: Our anecdotal observations suggested that hospitalized patients had considerable time during the day when they were not occupied with diagnostic testing or other activities. Accordingly, we sought to quantify the fraction of free time that hospitalized patients had available to participate in health educational activities and if and when during their hospitalization they were interested in participating in these activities and felt capable of doing so.

METHODS: From June 25 through August 15, 2005, randomly selected consenting patients admitted to the Internal Medicine service of an academic safety-net hospital became subjects of a time-motion study that was conducted from admission to discharge or to hospital Day 6. Another randomly selected group received daily surveys, and patients in a third group were interviewed on Day 2 or 3 of their hospitalization.

RESULTS: Time-motion data, surveys, and interviews were obtained from 13, 138, and 15 patients, respectively. Of the 316 patient-hours observed, 71% were classified as downtime. More than 80% of patients either “strongly agreed” or “agreed” that they were interested in and capable of being educated on all days of their hospitalization. The themes generated from the interviews included the desire to know more about self-management, prevention of disease recurrence or progression, and their primary illness.

CONCLUSIONS: Adult medical inpatients have considerable time and strong motivation to participate in health educational activities throughout their hospitalization. The current structure for educating hospitalized patients should be supplemented to take these findings into account. *Journal of Hospital Medicine* 2008;3: 238–246. © 2008 Society of Hospital Medicine.

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Educating patients about smoking cessation when they are hospitalized for acute coronary syndrome results in a 57% 1-year quit rate.¹ This rate is far higher than the typical 15%–30% 1-year quit rates observed with smoking cessation programs administered in the outpatient setting^{2–4} and suggests that hospitalized patients may be uniquely motivated to respond to health education.

Kerzman and colleagues⁵ found that 42% of hospitalized patients expressed a wish to receive more comprehensive counseling about their medications before being discharged from the hospital. And although the Joint Commission on Hospital Accreditation and the Centers for Medicare and Medicaid Services have established core quality measures mandating that patients hospitalized with congestive heart failure receive education as one component of a high-quality discharge process,^{6,7} approximately one third of patients nationally do not receive adequate patient education.⁸

Barber-Parker⁹ suggested that because patient acuity in hospitals was so high and patients were so commonly absent from their nursing units for testing and treatment, there was little time available for health education during their hospitalization. Anecdotal observations in our institution suggested, however, that adult patients hospitalized on the general Internal Medicine service spent much of their day doing little more than lying in bed watching television. Accordingly, we hypothesized that considerable time might be available for patient education during a hospitalization. We therefore sought to quantify the fraction of time patients were not involved in treatment activities, diagnostic testing, or other evaluations and to determine whether during these times they wanted and were feeling well enough to participate in educational activities. We also sought to determine what patients wanted to know about their health problems and what types of educational activities they most preferred.

MATERIALS AND METHODS

We conducted a time-motion and survey study from June 25, 2005, to August 15, 2005, at Denver Health Medical Center, an academic public safety-net hospital affiliated with the University of Colorado School of Medicine. All patients older than 18 years of age who spoke English or Spanish and were admitted to the general Internal Medicine service were candidates for enrollment. Exclusion criteria were being admitted to the intensive care unit, having an inability to communicate, being in contact precautions, and being previously enrolled. The study was approved by the Colorado Multiple Institutional Review Board. Written informed consent was obtained for all study participants.

At 8:00 AM, all patients admitted during the previous 15 hours were assigned a random number from a random number table and were approached for consent in numeric order. With 2 data collectors working daily, a maximum of 12 patients could be enrolled each day. Consenting subjects who passed a vision test were given the Test of Functional Health Literacy in Adults at the time of enrollment and a written questionnaire (in either English or Spanish) on a daily basis for a maximum of 6 days. Some of these patients also participated in a structured interview that was designed to elicit their views on health education topics and formats for education of hospitalized patients. Others, again

TABLE 1
Categorization of Patient Activities

First level	Second level	Third level
Downtime	Alone	TV Resting Sleeping Reading Telephone Other
	Friends/family	TV Resting Sleeping Reading Telephone/talk Other
Provider	Physician	
	Nurse	
	Physician and nurse	
	Physician and other	
Busy	Other	
	ADL	
	Meal	
	Out of room	
	Other	

determined by random number, were subjects of a time-motion study.

Demographic data collected included age, sex, language, race, comorbidities, insurance status, and discharge diagnosis.

Time-Motion Study

Patients were observed from 8:00 AM to noon and from 1:00 to 5:00 PM 7 days a week. Data were collected using TimerPro™ on a Dell Axim A5 pocket PC and imported daily into an Excel spreadsheet. Observations were categorized as downtime, busy time, or provider time and subcategorized as summarized in Table 1.

Questionnaire

We were unable to find a validated questionnaire in the literature that was designed to assess patient opinion or level of interest in educational activities during a hospitalization. Accordingly, we developed our own using a 5-point Likert scale (Box 1). Two outcomes researchers with expertise in using questionnaires for clinical research independently reviewed the questionnaire to establish face validity.

Interview

All patients were asked the open-ended questions listed in Box 2, and the entire interview was recorded on audiotape for subsequent analysis.

Box 1. Daily Questionnaire on In-Hospital Health Education

The following statements were read to the patients on a daily basis and answered using the following scale:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

1. I feel well enough today to learn about my illness or my health.
2. I want to learn more about my illness or my health today.
3. I have time to learn about my health today.
4. It is important to me to learn more about my illness or health while in the hospital.

Box 2. Interview Questions with Probes for Educational Preferences

1. What things related to your health would you like to learn more about while you are in the hospital? (list up to three topics in order of importance to you).
2. How can we help you learn more about your illness or health while in the hospital?
3. Who should do the teaching (eg, an MD, a nurse, a dietician, a medical student, peers, physical therapists, respiratory therapists)?
4. Who else should be present (eg, patients with similar illness, family, no one)?
5. How should this teaching be done (eg, didactic sessions, hands-on, video tape, pre- and post-testing)?

Data Analysis

All analyses were performed using SAS, version 9.1 (SAS Institute, Inc., Cary, NC). A P value < 0.05 was considered significant.

Time-Motion Data

Mixed-effects general linear models (growth curve or repeated measures), using SAS Proc Mixed, were used to test whether the proportions of downtime, busy time, and provider time differed by day of hospitalization. Linear growth curve models were used to test whether a linear trend was present. If not, repeated-measures models were used to obtain estimates by day of hospitalization.

Questionnaire Data

Mixed-effects general linear models (growth curve or repeated measures) were used to determine whether patient responses differed by day of hospitalization, as described above.

Interview Data

Tape recordings were reviewed in depth to code participant responses to the structured questions. We utilized the template style of analysis, coding

segments of the interviews and identifying illustrative quotes whenever possible. Key patterns and themes were summarized along with specific patient preferences regarding topics of interest and learning opportunities while in the hospital and after discharge.

RESULTS

Patient selection is described in Figure 1, and patient demographics are summarized in Tables 2 and 3.

Time-Motion Study

Thirteen patients were studied. Of the 315 patient-hours observed, 71% were categorized as downtime, 15% as provider time, and 14% as busy time. The proportion of downtime ranged from a low of 0.65 (SE 0.04) on hospital Day 2 to a high of 0.76 (SE 0.06) on hospital Day 4, but the differences in downtime proportions by day did not reach statistical significance ($P = .65$; Fig. 2). The lowest percentage of downtime observed in any patient on any day was 39%. The 125 hours of downtime observed consisted of 1317 separate blocks of time, 80% of which were less than 15 minutes in duration,

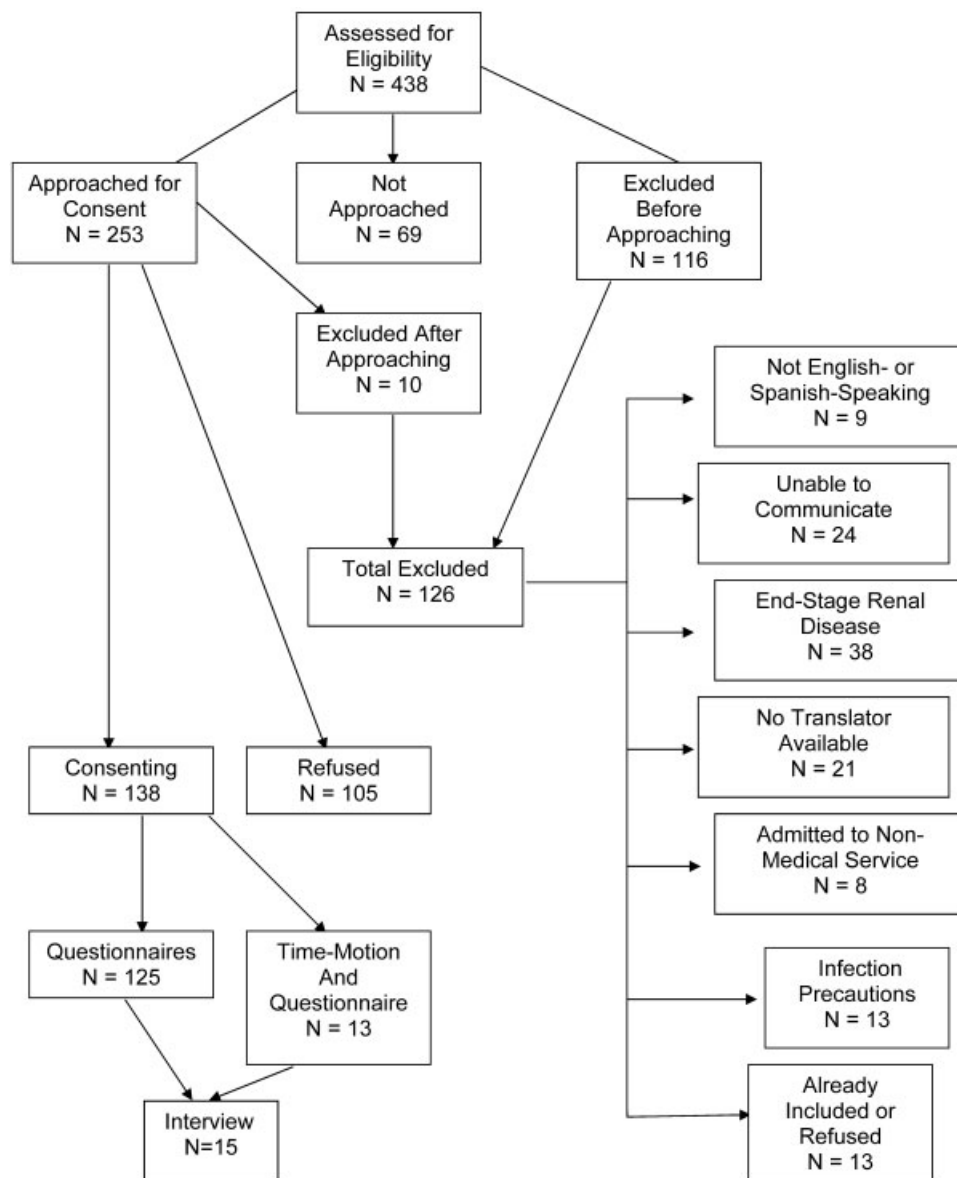


FIGURE 1. Enrollment by flowchart.

14% of which were 15 to 30 minutes in duration, and 6% of which exceeded 30 minutes in duration.

Thirty-six full days of observation, defined as greater than 7 hours of observation in 1 day, were used to assess the amount of time spent with providers. Of the 60 minutes/day (IQR = 44) that patients spent with health care providers, 21 minutes/day (IQR = 34) was spent with phlebotomists, physical or occupational therapists, dieticians, or social workers, 25 minutes/day (IQR = 25) was spent with patients' nurses, and a median of only 9

minutes/day (IQR = 11) was spent with their physicians.

Questionnaire

A total of 311 questionnaires were administered to the 138 consenting participants. Irrespective of the day of testing, 79% to 97% "strongly agreed" or "agreed" with the 4 statements (Fig. 3). In response to the first statement—"I feel well enough to learn"—patient scores increased steadily over the 6 days of hospitalization patients were surveyed (co-

TABLE 2
Patient Demographics [n (%)]

Demographic	Time-motion	Interview	Questionnaire
Study subjects	13	15	125
Sex			
Male	6 (46)	7 (47)	61 (49)
Female	7 (54)	8 (53)	64 (51)
Age (years), median (IQR)	47 (20)	51 (20.5)	51 (18)
Race/ethnicity			
White, non-Hispanic	6 (46)	5 (33)	46 (37)
Black/African American	3 (23)	4 (27)	27 (22)
American Indian	0 (0)	0 (0)	1 (1)
Hispanic	4 (31)	6 (40)	51 (41)
Primary language			
English	12 (92)	14 (93)	109 (87)
Spanish	1 (8)	1 (7)	16 (13)
Health literacy*			
Adequate	3 (75)	9 (82)	60 (71)
Marginal	1 (25)	0 (0)	6 (7)
Inadequate	0 (0)	2 (18)	18 (22)
Insurance status			
Self-pay	3 (23)	1 (7)	24 (19)
Medicaid	1 (8)	4 (27)	19 (15)
Medicare	3 (23)	0 (0)	2 (2)
Colorado Indigent Care Program	3 (23)	7 (47)	51 (41)
Private	2 (15)	1 (7)	5 (4)
Other	1 (8)	2 (14)	24 (18)

*Eighty-seven of the 138 study participants completed the TOFHIA. The remainder either declined or had a vision impairment that prevented them from taking the test.

efficient = 0.15, $P = .004$). On hospital day 1, the mean score was 3.85 (SE 0.08), and by day 6 the mean score had increased to 4.75 (SE 0.08). However, there was no significant change over time in patients' desire to learn, self-perceived time available to learn, or importance placed on learning during their hospital stay.

Interview

Fifteen interviews were conducted. Representative comments are presented in Table 4. Responses generally indicated that the patients had anxieties and uncertainties about their health and safety after discharge. Most participants wanted to know more about the condition for which they had been hospitalized, including information pertaining to management, prevention, etiology, and prognosis of their disease. Diabetic patients asked for information on insulin dosing, nutrition, and the effect of the disease on their bodies.

Patients preferred to pick their own topics for education rather than having topics chosen for them. Patients also showed interest in preven-

TABLE 3
Patient Discharge Diagnoses and Comorbidities [n (%)]

	Time-motion	Interview	Questionnaire
Study subjects (n)	13	15	125
Discharge diagnoses (selected)			
Coronary artery disease (including angina)	1 (8)	2 (13)	24 (19)
Congestive heart failure	1 (8)	1 (7)	4 (3)
Upper gastrointestinal bleeding, gastritis, reflux	2 (15)	4 (27)	14 (11)
Syncope	2 (15)	0	5 (4)
Acute renal failure	0	0	5 (4)
Pancreatitis	0	1 (7)	6 (5)
Venous thromboembolism	2 (15)	1 (7)	3 (2)
Chronic obstructive pulmonary disease	0	0	4 (3)
Diabetic ketoacidosis	1 (8)	1 (7)	3 (2)
Pyelonephritis	0	0	5 (4)
Pneumonia	2 (15)	1 (7)	5 (4)
Comorbidities			
Diabetes	5 (38)	9 (60)	41 (33)
Hypertension	1 (8)	9 (60)	55 (44)
Dyslipidemia	6 (46)	2 (13)	26 (21)
Tobacco	5 (38)	7 (47)	55 (44)
Chronic obstructive pulmonary disease	2 (15)	4 (27)	15 (12)
Congestive heart failure	2 (15)	2 (13)	13 (10)
Coronary heart disease	3 (23)	3 (20)	21 (17)

tion. One diabetic patient wanted to know how to prevent her children from becoming diabetic, and a cardiac patient wanted education on heart disease prevention. Other recurrent themes included the desire to know what was causing their illness and information about prognosis.

Almost all the patients were interested in more than one type of learning experience. The most frequently cited preference was to have a doctor or other knowledgeable health care professional answer questions specific to their individual situation. Video and group learning were each mentioned by approximately half the participants. Most patients thought that having family present during educational discussions was important.

Video was the most frequently mentioned learning tool, and patients thought it would be useful to have this modality available in the hospital as well as the home. Two patients expressed interest in computerized learning (one of whom had used health Web sites before his hospitalization). Most patients wanted handouts or reading material in addition to other methods of communicating information. Although many patients said they felt com-

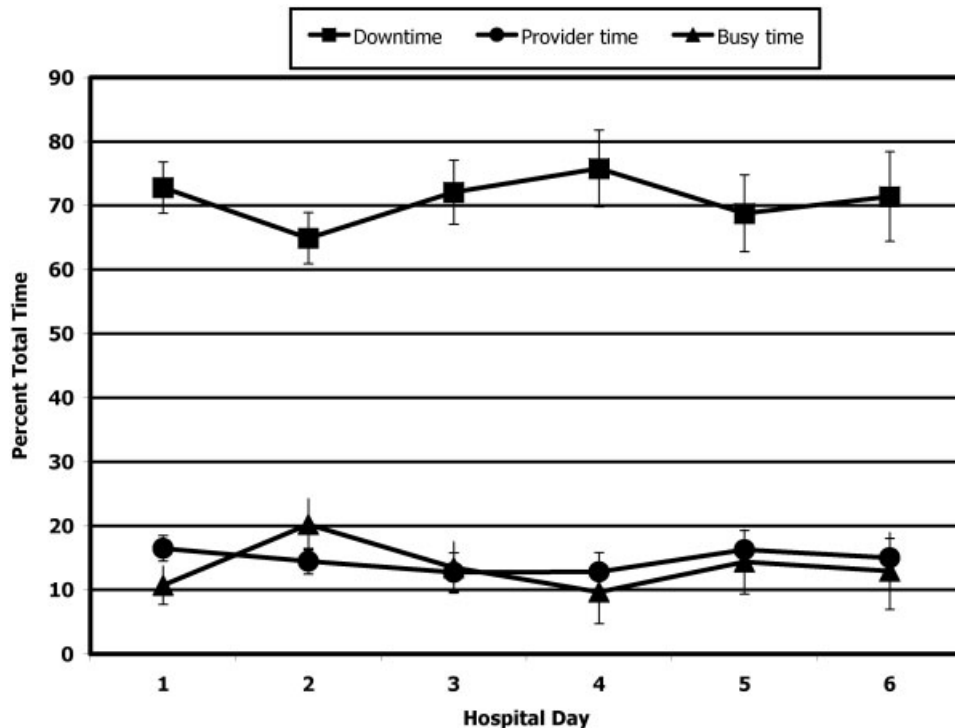


FIGURE 2. Patient time by hospital day.

fortable discussing their problems in group settings, some did not.

DISCUSSION

The important findings of this study are that hospitalized patients have a substantial amount of time available for health education and a considerable willingness and interest in participating in health educational activities. We found that although there was a great deal of time available on all days of hospitalization studied, patients felt increasingly well enough to participate in educational activities through their hospital stay.

We are unaware of other studies that have attempted to quantify the amount of time hospitalized patients are available for educational activities or whether they feel capable of participating in these activities. McBride¹⁰ found that 95% of hospitalized patients supported a “health-promoting hospital” and that almost 80% wanted to modify at least 1 aspect of their lifestyle. Martin and colleagues¹¹ found that patient satisfaction was improved by a “patient-centered” unit incorporating dedicated nursing staff to promote patient involvement and provide personalized care and education.

Barber-Parker⁹ suggested that high patient acuity, short durations of hospitalization, and lack of patient availability because of testing and treatment limited the opportunities that patients had for health education during their hospitalization. These conclusions were reached on the basis of surveys of nurses’ perceptions, however, rather than on direct observations or assessments of patients’ perceptions.

Our findings suggest that many types of patient educational approaches may be needed to achieve maximal effectiveness and that regardless of the specific approach employed, the focus should be on the primary reason for a patient’s hospitalization, what the hospitalization meant, why it happened and what the patient can do to prevent hospitalization from occurring in the future.

Transitions in care have been identified as periods in which communication lapses occur and outcomes can be adversely affected.¹² A recent study by Epstein and colleagues¹³ found that almost 12% of patients had new or worsening symptoms of disease within the first few days after discharge from the hospital and that 22% either did not pick up their medications or understand how to

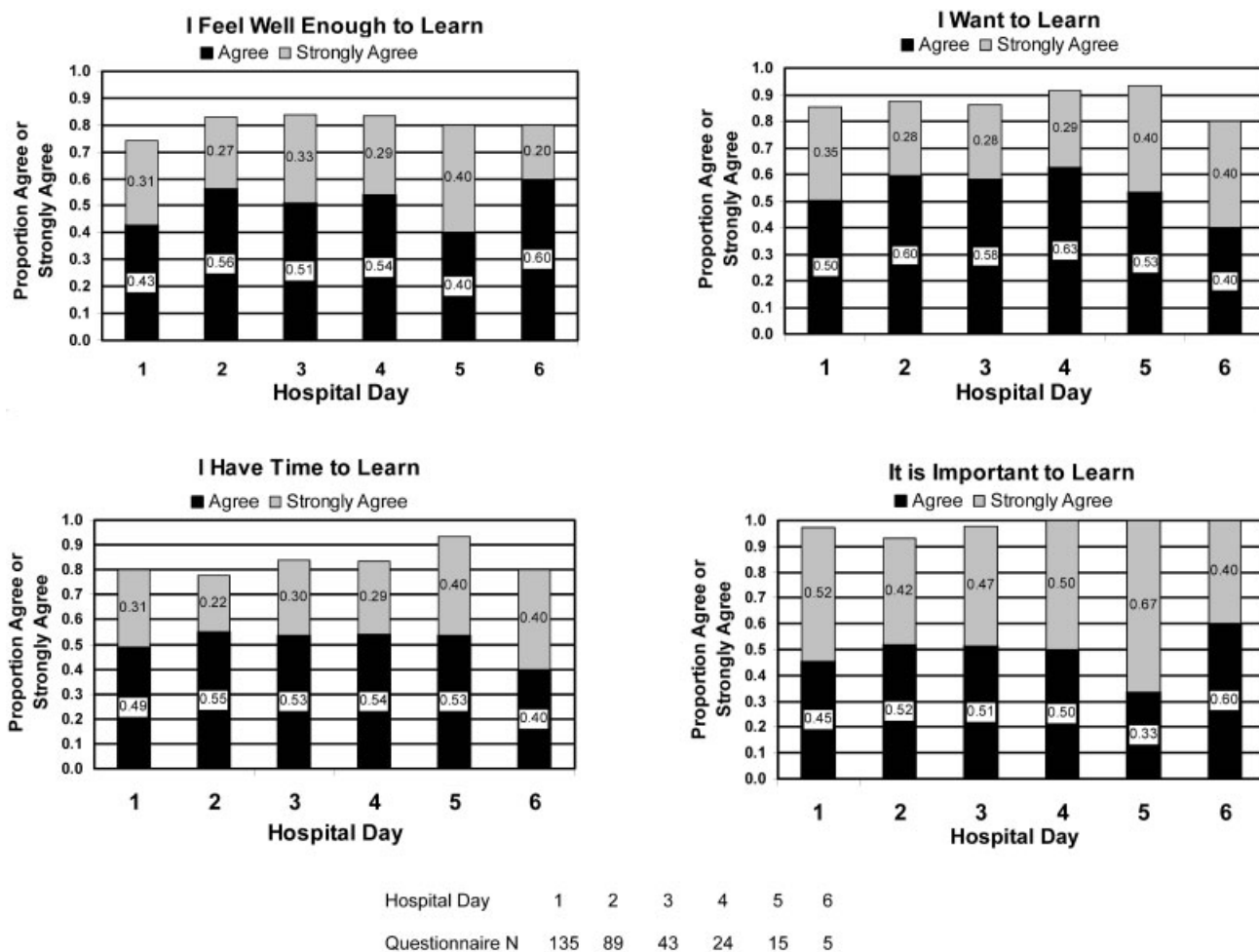


FIGURE 3. Patients' perspectives on their ability and motivation to learn while hospitalized.

take them (consistent with the observations of Kerzman and colleagues).⁵ The most common action taken in response to these findings was nurse-mediated patient education. Our study indicates there is potential for further educational processes in hospitals, which may improve the safety of transitions from a hospital setting to outpatient care.

Although many disease management programs have been studied in the outpatient setting,¹⁴⁻¹⁷ very few have been extended into hospitals. Accordingly, hospitalists are ideally suited to develop and implement disease management programs in concert with outpatient efforts.¹⁸ Our study suggests there is an underutilized opportunity for hospital-based physicians and other health care providers to work with patients at a time when they are uniquely focused on their own health and free from many of the time constraints of their normal lives.

Although JCAHO mandates that hospitalized patients "receive education and training specific to the patient's needs and as appropriate to the care, treatment and services provided,"¹⁹ there is a paucity of data describing the educational processes in US hospitals. Johansson and colleagues²⁰ conducted a survey in a Finnish hospital where patient education is also mandated. Written materials were given to about 55% of the patients. Demonstration and practice were used with about one third, whereas the Internet and videotapes were used for fewer than 10%. Although patients underwent educational activities throughout their hospitalization, and most were satisfied with the process, Johansson and colleagues found that only 59% felt that what they knew about their care was sufficient, almost a third felt they did not know enough about the side effects of their medical care, and almost

TABLE 4
Patients' Perspectives on Topics and Methods for Inpatient Health Education

Theme	Sample quotes
<i>Preferred topics</i>	
Self-management	"I need to know what to do when I go home, how to take care of it." "Medical people...don't give enough information to the patient and patient's family so they can help themselves. You need to encourage patients to help themselves, take some responsibility for themselves."
Prevention of disease recurrence or progression	"It's okay to tell people that they have something and give them medicine, but also tell them what they can do to prevent it or make it less painful. I've known about bronchitis for many years, but didn't know it would affect my heart."
What's happening to me?	"Am I going to die...how long?"
Just fix me	"I came to the hospital to get fixed, not educated. I'm results-oriented, not cause-oriented."
<i>Preferred learning methods</i>	
One-to-one didactics with MDs	"I'd like one-to-one time with someone who has the time to listen." "One to one with doctors who can explain what can happen, what to take, what not to take."
Family involvement	"Get the family involved so the family understands the limitations of the person, how medications affect them. To say a person has a heart condition is a very vague statement. If they [family] understand more, it's better."
Groups	"A group of people with similar illness...I like groups where everyone listens." "I'd participate in groups at the hospital but not at home."
Video	"Hospital TV is not meeting my needs."
Printed material	"A doctor or nurse tell me what's going on and then also handouts on dietary and nutrition."
Electronic learning	"I learned a lot through the encyclopedia of family health care, and through Web sites..."

half felt they did not have sufficient input into what they were being taught.

Although we found a large amount of time that might be used for patient education during a hospitalization, this time was commonly limited to 15-minute blocks, as has been noted previously.⁹ This observation implies that educational activities should be designed so they can be conducted over short periods and/or stopped for short periods when interruptions occur or that the processes of care during a hospitalization should be altered to create larger blocks of continuous time available for educational activities.

A number of issues could have biased our results. Only 66% of the patients who were approached to participate agreed to do so. Because those declining may have been sicker and because sicker patients may require more diagnostic testing or more invasive treatment, we may have overestimated both the amount of downtime available and the willingness of patients to participate in educational activities. If we assume, however, that *all* patients who refused to participate either "disagreed" or "strongly disagreed" with the statements in the questionnaire regarding their interest in educational activities, the fraction of patients "agreeing" or "strongly agreeing" with idea that they were well enough and interested would still be 57% to 75% of the population sampled. Accordingly, this

potential bias, if it occurred, would not alter our conclusions.

The time-motion studies were only performed between 8:00 AM and 5:00 PM, such that the resulting data do not reflect any diagnostic testing, therapeutic interventions, or contact with health care providers that occurred at other times. This may have contributed to the strikingly small amount of time that patients spent with their physicians and nurses. If patient time after 5:00 PM and before 8:00 AM had been observed and included, it is likely that the absolute amount of time spent with physicians and nurses would increase, whereas the overall proportion of patient time spent with providers would decrease.

We were also only able to collect data on 13 time-motion subjects. This limited sample size from a single institution may not be representative of all hospitalized non-ICU patients on general medical wards. Accordingly, we make no claims that our data can be generalized to the entire population of patients admitted to non-ICU medical services. However, the results of our surveys, which sampled a much broader patient population and supported our time-motion findings, suggest that our time-motion findings are likely to be representative of significant underutilized time and motivation for patient education in the hospital setting.

Also, it is important to note that although the

time-motion studies were only done with 13 patients, these studies are extremely labor intensive and are rarely done with much larger samples. In addition, the SDs on the data collected from the time-motion studies were quite small. It is possible that if a larger sample were studied, the percentage of “free time” might be larger or smaller than what we observed for the 13 patients we studied. However, it would be quite unlikely that the amount of free time would be so small (eg, 10%-15%) that it would invalidate our conclusion that considerable time is available for patient education over and above what currently occurs in most hospital settings.

A patient’s self-perception of his or her ability to learn may not reflect that patient’s true cognitive readiness to do so. JCAHO requirements mandate that nurses be trained to assess patients for their ability to learn and to do so as part of the admission process. After reviewing all day 1 patient responses to our questionnaires, in no instance did a nurse assess a patient as having a barrier to learning when the patient had reported feeling well enough to learn. Accordingly, although we performed no direct tests of patients’ ability to learn, this retrospective independent assessment did not suggest that patients systematically overestimated their ability to learn.

Finding that hospitalized patients are unoccupied for approximately 70% of their daytime hours and that most patients are both highly motivated to learn and have few barriers to doing so indicates that educational activities during hospitalizations have substantial potential for expansion. The current structure for educating hospitalized patients should be supplemented to take these findings into account.

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