

Patient Satisfaction With a Hospitalist Procedure Service: Is Bedside Procedure Teaching Reassuring to Patients?

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Disclosure: Nothing to report.

BACKGROUND: In recent years, hospital medicine programs have adopted “procedure teams” that supervise residents in performing invasive bedside procedures. The effect of procedure teams on patient satisfaction is unknown.

OBJECTIVE: We sought to measure patient satisfaction with procedures performed by a hospitalist-supervised, intern-based procedure service (HPS) with a focus on patient perception of bedside communication.

DESIGN: This was a prospective survey.

METHODS: We surveyed all patients referred to the HPS for bedside thoracentesis, paracentesis, lumbar puncture, and arthrocentesis at a single academic medical center. Following each procedure, surveys were administered to English-speaking patients who could provide informed consent. Survey questions focused on patients’ satisfaction with specific aspects of procedure performance as well as the quality and impact of communication with the patient and between members of the team.

RESULTS: Of 95 eligible patients, 65 (68%) completed the survey. Nearly all patients were satisfied or very satisfied with the overall experience (100%), explanation of informed consent (98%), pain control (92%), and expertise (95%) of physicians. The majority of patients were satisfied with procedure duration (88%) and in those with therapeutic procedures most (89%) were satisfied with improvement in symptoms. Hearing physicians discuss the procedure at the bedside was reassuring to most patients (84%), who felt this to be a normal part of doing a procedure (94%).

CONCLUSIONS: Patients are highly satisfied with procedure performance by supervised trainees, and many patients were reassured by physician communication during the procedure. These results suggest that patient experience and teaching can be preserved with a hospitalist-supervised procedure service. *Journal of Hospital Medicine* 2011;6:219–224. © 2011 Society of Hospital Medicine.

KEYWORDS: graduate medical training, patient satisfaction, procedure education, supervision.

Additional Supporting Information may be found in the online version of this article.

In order to improve resident supervision and timeliness of invasive bedside procedures such as paracentesis, thoracentesis, and lumbar puncture, some academic medical centers have implemented procedure services that focus on providing high-quality procedural care.^{1,2}

Procedure services have the potential to affect patient satisfaction, a key indicator in quality of care measurement.³ Having senior physicians present increases patient comfort during outpatient case presentations⁴ and improves patient satisfaction with explanations of tests and medications.⁵ However, we had concerns that teaching during a procedure may heighten patient anxiety. Patients are reluctant to be the first patient of a resident or medical student for a procedure,^{6–8} and patients are more likely to refuse consent to have a resident perform complex procedures.⁸ In previous studies, patient satisfaction with gynecological exams and flexible sigmoidoscopy performed by residents was comparable to satisfaction with those performed by staff physicians,^{9,10} though in the case of flexible sigmoidoscopy, procedure duration was slightly longer.¹⁰ Few, if any, data describe bedside teaching or patient impressions of physician communication during procedures.

We carried out a prospective study of patient perceptions of the University of California San Francisco (UCSF) Hospitalist Procedure Service (HPS). Our study had the primary goal of understanding how our model—which involves bedside procedural teaching and feedback in “real time” (eg, as the procedure is performed)—is perceived by patients.

Patients and Methods

Site

Our survey was carried out at UCSF Moffitt-Long Hospital, a 560-bed university teaching hospital and the primary university hospital for the University of California San Francisco. This study was reviewed and approved by the Committee on Human Research at UCSF.

Procedure Service

The HPS is composed of two interns who rotate for 2 weeks on a mandatory rotation performing the majority of the procedures done by the service. Every procedure is supervised by an attending hospitalist who has received extended training from interventional radiologists and emergency

department ultrasound faculty. Patients are referred to the service by their primary admitting team. Interns receive procedure-specific didactics, demonstration, and practice with procedure kits, supplemental readings, computer-based procedure modules, and evidence-based summaries of procedure-related considerations. All interns also attend a half-day procedure simulation session to review procedural and ultrasound techniques.

While interns obtain informed consent and prepare the patient for the procedure, the attending and intern team communicate the following points with each patient: 1) identification as the dedicated procedure team, separate from the primary team caring for the patient; 2) attending self-identification as the supervisor; 3) attention to stepwise communication with the patient during the procedure; 4) attention to patient comfort throughout the procedure; 5) emphasis on patient safety through the use of time-outs, sterile technique, and ultrasound when appropriate; and 6) the intention to discuss best practice and teach during the procedure.

All paracentesis and thoracentesis sites are marked by using bedside ultrasound (S-Cath, SonoSite, Bothell, WA) guidance prior to and, if needed, during the procedure. Ultrasound is occasionally used for marking joint aspiration and lumbar puncture.¹¹ Interns are responsible for making an initial site marking, which is then confirmed by the attending physician. Although not systematized, our service encourages the intern and attending to communicate about proper technique during the procedure itself. For example, attendings ask questions about technique based on evidence in the literature (eg, “Why do you replace the stylet in a lumbar puncture needle prior to removal?”) or about trouble shooting (eg, “What would you do if the flow of ascites stops during this paracentesis?”) and also correct any errors in technique (“Recall the angle you intended to use based on the ultrasound view”).

Patients

Patients are referred to the procedure service by their primary team; referrals are accepted for patients on all services at all levels of care, including the emergency department (ED) and the intensive care unit (ICU). Participants in this study were referred for one of our target procedures (paracentesis, thoracentesis, or lumbar puncture) between November 2008 and July 2009. Patients gave written consent for the supplemental survey independent of consent for the procedure. All consents and procedures were performed in a patient's hospital room and one family member was allowed to stay in the room if desired by the patient. After the completion of the procedure, the attending on the procedure service at the time, which included study authors D.S. and M.M., approached consecutive patients who spoke and read English and were deemed to have capacity to consent for their own procedure to be surveyed. Patients were considered to have capacity to consent based on commonly

accepted criteria described in the literature.^{12,13} Patients were also excluded if their procedure was performed by the attending alone, if they had repeated procedures done by the service, or if they were too altered or critically ill to participate in the survey.

Survey

Our survey was developed through identification of items reported in the literature,^{14–21} as well as items newly developed for purposes of examining our primary aims. Newly developed questions focused on patients' satisfaction with major aspects of procedure performance as well as the quality and impact of communication with the patient and between members of the team. Two open-text questions were included to allow patients to share what went well with the procedure as well as areas for improvement. The research team developed a pool of question items for potential inclusion in a patient satisfaction questionnaire. These items were then shown to a group of research-oriented health professionals, who meet regularly to review academic research protocols. The group provided their opinions about the content and comprehension of the questions, and the written survey employed was a result of their revisions (see Appendix in Supporting Information online).

Written surveys were distributed to patients by the hospitalist attending on service following the procedure as permitted by patients' severity of illness and availability. Surveys were anonymous and self-administered by the patient or a family member who was in the room for the procedure; all questions were voluntary. A nurse was made responsible for collecting the survey when possible. Survey results were entered into a database without identifiers, with limited demographic information; patient gender, age, and procedure type were included by the attending hospitalist at the end of the survey. A separate and more detailed procedure database was kept of all procedures performed and was used to record patient consent or reason for not consenting as well as documented receipt of a completed survey. This non-anonymous database contained detailed supplemental information including patient age, level of care, referring service, presence of bloody fluid at any point during the procedure, and physician-reported immediate complications at the bedside in free text.

Analysis

Reported immediate complications were classified into major and minor based on reported definitions in the literature.^{22–26} Similar to previous studies, major immediate complications were defined as those requiring further procedural intervention, medical therapy, or both.²⁷ Major complications were defined as: bleeding requiring transfusion, pneumothorax requiring a chest tube, respiratory failure, bowel perforation, cerebral herniation or shock, cerebrospinal fluid (CSF) leak requiring intervention, and transfer to a higher level of care. For patients receiving a thoracentesis,

chart review was performed to determine the presence of a follow-up chest x-ray, the presence of a pneumothorax, or clinical evidence for re-expansion pulmonary edema. We analyzed differences between respondents and non-respondents using Chi-square tests for categorical variables (gender, level of care, referring service, procedure type, bloody fluid, and immediate reported complications) and independent *t* tests for continuous variables (age).

After review of the open-ended fields, responses were classified into the following categories: pain control, physician skill, professionalism, communication, symptom relief, procedure duration, and miscellaneous comments. Responses regarding patient perceptions of physician communication were dichotomized into positive (1 = Strongly Agree, 2 = Agree) and negative (3 = Neutral, 4 = Disagree, and 5 = Strongly Disagree), and independent *t* tests were used to determine the contribution of factors, such as age, while Chi-square tests were used for the contribution of gender and procedure type. All statistical tests were performed by using the SAS statistical application program (version 9.2).

Results

Respondent Characteristics

Of 324 procedures performed by the HPS during the study period, 95 (29%) were eligible for consent. Of the 229 patients not eligible for consent, 32 (10%) were excluded because the procedure was performed by the attending alone, 76 (23%) lacked English proficiency or literacy, 66 (20%) had altered mental status, 32 (10%) were intubated and/or had severe illness precluding consent, and 23 (7%) were repeat procedures on patients who had previously completed the survey. Only two patients specifically requested an attending to perform the procedure after an introduction to the service. Of the 95 patients eligible for consent, 89 were consented for the survey, and 65 (68%) completed the survey. Of the six eligible, non-consented patients, all were leaving the floor immediately following the procedure, and time did not allow for consent and survey distribution. There were no differences between eligible responders and nonresponders in age, gender, procedure, requesting service, presence of bloody fluid, or physician-reported immediate complications (Table 1).

Complications

As complications would likely play a role in procedure satisfaction, we describe immediate complications for the study population. Of the 324 procedures performed during the study period, no patient had predefined major immediate complications. Upon further chart review of the 96 patients that had a thoracentesis performed, all had a follow-up chest x-ray and none suffered an iatrogenic pneumothorax or re-expansion pulmonary edema. Minor immediate complications for the 324 procedures were reported as follows: postprocedure pain in four patients (1.2%), cough in nine patients (2.8%), five equipment malfunctions (1.5%), four

TABLE 1. Baseline and Procedure Characteristics by Responder and Nonresponder (N = 89)

Demographics	Responder ^a (n = 65)	Nonresponder (n = 24)
Age, y [mean (SD)]	55.4 (15.7)	50.4 (17.4)
Male gender, n (%)	41 (63.1)	11 (45.8)
Procedure, n (%)		
Paracentesis	31 (47.7)	10 (41.7)
Thoracentesis	17 (25.8)	6 (25.0)
Lumbar puncture	15 (22.7)	7 (29.2)
Arthrocentesis	2 (3.0)	1 (4.2)
Patient location, n (%)		
Floor	47 (72.3)	19 (79.2)
Step down/telemetry	17 (26.1)	3 (12.5)
Intensive care unit	1 (1.5)	2 (8.3)
Service requesting, n (%)		
Medicine	29 (44.6)	10 (41.7)
Cardiology	6 (9.1)	3 (12.5)
Liver transplant	20 (30.3)	7 (29.2)
Bone marrow transplant	7 (10.6)	1 (4.2)
Surgery	0	1 (4.2)
Neurosurgery	1 (1.5)	1 (4.2)
Other	2 (3.0)	1 (4.2)
Reported presence of bloody fluid at any point in the procedure, n (%)	9 (13.6)	4 (16.7)
Other reported immediate complications		
Equipment malfunction	2 (3.0)	1 (4.2)
Significant cough/pleuritic pain	1 (1.5)	1 (4.2)
Transient oxygen desaturation	1 (1.5)	0
Ascites leak	0	0
Hematoma	0	0
Persistent bleeding	0	0
Transfer to a higher level of care	0	0

^a Differences between responders and non-responders were not statistically significant. Abbreviation: SD, standard deviation.

ascites leaks (1.2%), and one incisional bleed requiring a suture for hemostasis (0.3%). There was no significant difference in complications between those consented for the survey and the total study population.

Procedure Satisfaction

More than 90% of patients were satisfied or very satisfied with most aspects of the procedure, including the informed consent process, pain control, expertise, and courtesy of physicians (Table 2). The percentage of patients satisfied with the duration of procedure (88%) was lower than for other measures of satisfaction. Of the 38 patients receiving therapeutic procedures, 34 (89%) were satisfied or highly satisfied with the improvement in symptoms following the procedure.

When asked what went well with the procedure, 59 (91%) respondents provided additional comments and feedback. Each response was classified as described in the Methods section. Of the free text responses, 8 of the 59 patients (14%) commented on the attention to pain control (eg, "The caring and attention to my pain was most important to me"), 5 (8%) on the skills of the operators ("Great

TABLE 2. Procedure Satisfaction Measures (N = 65)

	Very Satisfied and Satisfied No. (%)	Neutral No. (%)	Dissatisfied and Very Dissatisfied No. (%)	N/A No. (%)
Your overall procedure experience	65 (100)	0 (0)	0 (0)	0 (0)
Explanation of the procedure, risks, and benefits before the procedure	64 (99)	1 (2)	0 (0)	0 (0)
Pain control during the procedure	60 (92)	5 (8)	0 (0)	0 (0)
Expertise/skill of the physicians performing your procedure	62 (95)	3 (5)	0 (0)	0 (0)
Courtesy and bedside manner of the physicians performing your procedure	65 (100)	0 (0)	0 (0)	0 (0)
The time it took to perform your procedure	57 (88)	6 (9)	0 (0)	2 (3)
Improvement in your symptoms following this procedure, if applicable	34 (52)	7 (11)	0 (0)	24 (37)

examination of the entire stomach region with the ultrasound to ensure the best position of the catheter”), 6 (10%) on the courtesy and professionalism of the team (eg, “Courteous, team-feeling, addressed my concerns”), 9 (15%) on their communication with the team (eg, “The doctors made me feel very comfortable before the procedure by laying out the plan and explaining each part of the procedure”), and 8 (14%) on relief of their symptoms (eg, “There was an almost immediate and significant improvement in my breathing, bloating, and pain”). Twenty-three of the 59 comments (39%) were categorized as miscellaneous (eg, “All went great. I fell asleep”).

When asked areas for improvement, 55 (85%) patients responded. Thirty-three patients (60%) reported that “nothing” could be improved or they instructed the team to “just keep doing what you are doing,” while 22 (40%) patients expressed a concern. Responses were categorized in a similar fashion to the positive responses. Five of the 22 negative comments (23%) reported that the procedure took too long (eg, “Procedure could have been shorter. I got tired sitting up”), 4 (18%) commented on pain control (eg, “The poke for marking my skin hurt more than the anesthetic. I was surprised”), 6 (27%) felt communication was a problem (eg, “Discuss the steps with the patient audibly, no whispering, speak clearly”), and 7 (32%) had miscellaneous concerns (eg, “Try not to do this procedure right after another one”).

Physician Communication

Sixty-four patients (98%) reported that the physicians performing their procedure communicated with each other during the procedure (Table 3). Although one patient did not feel

TABLE 3. Physician Communications Measures (N = 64)

	Strongly Agree and Agree No. (%)	Neutral No. (%)	Disagree, and Strongly Disagree No. (%)
I felt that the physicians talking to each other about my procedure was reassuring to me	54 (84)	10 (16)	0 (0)
Physicians talking to each other while doing a procedure is a normal part of doing a procedure	60 (94)	4 (6)	0 (0)

that the physicians communicated with each other, he or she still answered the follow-up questions regarding perceptions of physician communication. We excluded this patient from our analysis as his or her answers may not be reliable. The majority of patients (84%) reported this communication as reassuring and felt it was a normal part of procedure performance (94%). Those that did not agree that physician communication was reassuring did not differ in average age ($P = 0.307$), gender ($P = 0.511$), or procedure type ($P = 0.562$).

Of all positive and negative comments, five specifically addressed communication between physicians. Most (four) reflected satisfaction with bedside teaching (eg, “They discussed the procedure in a professional manner and eased my mind at all times”) and with having an expert in the room (eg, “[The team] discussed things like needle placement, which was nice because there was a second opinion right there in the room”). Patients also felt that it was “good to experience the teaching,” with one patient reporting that the best part of the procedure was “watching doctors learn from each other.” Patients did not express specific reservations about bedside teaching, resident technique, or fear of complications in free text.

Discussion

Even though novice interns performed procedures and simultaneous bedside teaching, patient satisfaction with a teaching procedure service was high, and reported complication rates were low. In addition, a majority of patients found discussions related to teaching activities reassuring and potentially important to their perception of care quality. Analogous studies examining patient satisfaction with endoscopic care found similar rates of patient satisfaction with endoscopists’ bedside manner, technical skills, and pain control, but these studies included sedated patients.²¹ Our results are unique, as we evaluated awake patients with attention to perception of bedside teaching with novice interns.

Our findings offer an alternative strategy for bedside procedural teaching that employs transparency in the use of an expert and a trainee to introduce patients to bedside teaching by experts, which is not common at many academic medical centers.²⁸ Patients may have been reassured by a clear explanation of the role of the service and the providers involved as well as an assurance of expertise and attention to patient comfort and safety. In addition to patient satisfaction, this

model has the potential to impact both the safety of bedside procedures and housestaff education around procedure performance. For example, pneumothorax rates using our procedure service model are lower than those published (0% vs. 4% for ultrasound-guided thoracentesis and 8.5% for thoracentesis by less experienced clinicians).²⁹

Providers may be reluctant to teach at the bedside of awake patients for fear of heightening patient anxiety over trainee inexperience. In the 1960s similar fears were raised over the concern for patient anxiety with bedside rounding,³⁰ but later studies revealed these concerns to be largely unfounded. Instead, bedside rounds have been shown to positively influence patients' feelings about their hospital experience and their relationships with their physicians compared with patients whose case presentations were made in a conference room.^{31,32} Given the opportunity to comment on areas for improvement, patients in our study specifically elaborated regarding pain control, communication, and efficiency problems. Although 16% of patients did not find the communication of physicians reassuring, none of the negative comments reflected problems with bedside teaching, but rather concepts such as desiring a better explanation of steps throughout the procedure. Specifically, patients desire better communication for unanticipated pain.

There are several limitations to this study. Lack of patient satisfaction data from a control group of patients whose procedures were performed by attendings or housestaff alone limits our ability to draw conclusions about our satisfaction scores. The scarce applicable literature offers only imperfect comparison data. Because hospitalists were not blinded to the survey, attending behavior may have been subject to a Hawthorne effect.³³ Consenting patients after the procedure could have provided hospitalists with an opportunity to exclude patients who appeared less satisfied with their procedure; however, attempts were made to prevent this behavior by requiring strict accounting of why a patient was not consented for the study. Use of alternative personnel for consent such as nurses was explored, but was found not to be feasible due to limited resources. These data are only applicable to English-speaking patients who are literate and well enough to complete a survey. It is not clear whether the experience for other patients would reflect the same outcomes. It is plausible that non-English-speaking patients might have more concerns about incomprehensible conversations taking place during their procedure. Although the surveys were anonymous and patients were told that the proceduralists would not see individual responses, responses may have been biased out of patient concern that their response might affect their care. Hospitalists obtaining consent, however, were careful to stress anonymity and the distinction between the primary team and the procedure team.

Academic hospitals are struggling with providing quality procedural care while balancing housestaff education and experience.²⁸ With hospitalists playing an increasingly prominent role in housestaff education and patient satisfaction initiatives, the supervision of housestaff by trained hospitalist

faculty may help meet both aims in the performance of invasive bedside procedures, particularly at institutions where simulation training resources are limited. Although concern may exist for potential patient anxiety with bedside teaching, our data demonstrate high levels of patient satisfaction with a hospitalist procedure service despite novice procedure performers and an emphasis on teaching during the procedure.

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