The Art of Bedside Rounds: A Multi-Center Qualitative Study of Strategies Used by Experienced Bedside Teachers

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BACKGROUND: Medical educators believe bedside rounds are effective for the delivery of patient-centered care, and are necessary in helping trainees acquire competence in clinical care. Although recommendations for bedside rounds have been reported, a recent, systematic assessment of strategies used by current-day bedside teachers was needed to advance knowledge of this teaching method.

OBJECTIVE: To identify and understand bedside teachers' 1) preparatory steps, 2) patient selection, and 3) role allocation during the process of bedside rounds.

DESIGN: A qualitative inductive thematic analysis using transcripts from audio-recorded, semi-structured telephone interviews.

PARTICIPANTS: Internal medicine physicians (n=34) who perform bedside rounds from ten academic US institutions (2010–2011).

APPROACH: A purposive sampling strategy was utilized to identify physicians who were active inpatient attending physicians and met specific inclusion criteria for "bedside rounds." A total of 34 interviews were completed, and each was recorded and transcribed verbatim. A thematic analysis extracted key themes pertaining to the three objectives.

KEY RESULTS: Most respondents (51 %) were associate or full professors, with an average of 14 years of academic experience. Attending physicians prepared using trainee-specific, patient-specific and disease-specific information, while also mentally preparing for bedside rounds. They sought trainee buy-in and learning objectives, reviewed expectations and methods to ensure patient comfort, and provided early guidance with bedside encounters. Patients were selected if they

required immediate care, were new to the service, or had a high educational value, while patients were deferred if unavailable, unwilling, or unable to communicate. The team members' roles during bedside rounds varied, with trainees being given graduated autonomy with increased experience.

CONCLUSIONS: Bedside teachers' methods for preparation, patient selection, and role allocation during bedside rounds enhance trainees' education within the workplace. Strategies used by experienced bedside teachers can be used for faculty development efforts aimed at promoting this activity.

KEY WORDS: medical education-qualitative methods; medical education; medical education-faculty development; patient-centered care.

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INTRODUCTION

Bedside rounds have been a principal strategy for clinical education since the time of William Osler, and are still considered essential for helping physicians-in-training to achieve clinical competence.^{1–4} In recent years, however, the use of bedside rounds has declined, with < 25 % of encounters occurring at the bedside.^{5–9} Additionally, following the Accreditation Council on Graduate Medical Education (ACGME) duty hour mandates, residents and faculty have raised concern about the impact on educational quality, reporting less time spent in educational conferences and at the bedside.^{10,11}

Lack of comfort, inexperience, and increasing demands on providers are thought to be primary reasons current-day clinician educators use bedside teaching less than their predecessors.^{12–14} For physician or divisional efforts seeking to build bedside skills, there is limited rigorous research

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available for guidance. Janicik et al. describe a model for bedside teaching derived from workshops with medical educators, and Kroenke and Ramani et al. suggest guidelines and “tips” for best methods.^{15–17} Collectively, Irby’s works provide an empirical model of best practices for bedside teaching, identifying the knowledge domains, instructional characteristics, and clinical instructional reasoning processes used by attending physicians during successful teaching rounds.^{18–20} Although these works inform our understanding of the process of bedside rounds, more research that systematically explores the practices of bedside teachers, informed by ACGME duty hours and current pressures of inpatient medicine, could help guide faculty development and mentoring efforts aimed at promoting this teaching strategy.

In this study, we report the results of semi-structured interviews with academic physicians who routinely use bedside rounds for clinical teaching. Our aim was to identify a core set of effective techniques used in: 1) preparing for bedside rounds, 2) patient selection, and 3) role allocation during bedside rounds.

METHODS

Study Approach

Based on our review of the literature, strategies used in preparation, patient selection, and role allocation during bedside rounds were not well published. Irby and Janicik highlighted preparation strategies used by attending physicians, but more recent work was not identified.^{15,19} At the time of our study, no work reported on patient selection or role allocation; Gierk et al. has subsequently reported patient selection processes for medical student rounds.²¹ Given this paucity in the literature, these areas became the focus of our research. To construct a conceptual understanding of bedside teachers’ approaches used in these three areas of the process, a thematic analysis was used.^{22,23} Although suggested best practices for bedside rounds have been published, none has reported a generalized consensus from bedside teachers pertaining to these three objectives; therefore a data-driven, inductive approach was taken. The relevant literature on “attending rounds” did inform the survey and probing questions.^{15–17,19} We chose interviews because we wanted to explore individual practices in detail.

Participant Sampling

To obtain a purposive sample representative of academic medical centers, we began the recruitment process by selecting one colleague from each of ten U.S. institutions; most of these colleagues were Clerkship Directors in

Internal Medicine (CDIM) members, or had prior research experience. Based on a prior study, we estimated that each institution would have three to six clinicians who would meet the inclusion criteria for bedside rounds, so we recruited ten institutions to participate.⁶ Each of the initially selected individuals was asked to recruit three to six bedside teachers who were known locally to be respected bedside teachers, either through bedside teaching awards, or as identified by faculty or house staff (Appendix 1). The participants had to: 1) be general internists (either hospitalists or non-hospitalists), 2) have served as inpatient attending physician with trainees at least 2 weeks in the prior 2 years, and 3) perform ‘bedside rounds’ a minimum of 3 weekdays. We defined “bedside rounds” as: “the team of medical providers, including at minimum one house officer and the attending physician of record, presenting the patient’s history or reviewing one physical exam component, in addition to discussing the diagnosis/management at the bedside in the patient’s presence.” We explicitly sought to exclude “hallway rounds” or “card flips,” which may include some bedside activity but do not meet all of the above criteria. Lead investigators sent potential participants an email script for consent and an interview invitation.

Data Collection

From February to November 2010, using an interview guide created for this study, two investigators (J.G., B.D.) performed digitally recorded, one-on-one telephone interviews, consisting of closed-ended questions assessing demographics and attitudes, and open-ended questions that allowed for spontaneous responses about the main research questions (Appendix 1). Each participant was offered a \$15 gift certificate at the study’s completion. A professional transcriptionist transcribed each recorded interview verbatim.

Data Analysis

During data collection, the lead investigator (J.G.) took notes, and using a process of constant comparative analyses, identified themes and categories and generated a preliminary codebook to facilitate analysis. Based on this drafted codebook, data saturation was reached after 24 interviews, but all planned 34 interviews were completed and transcribed. Two investigators (J.G., B.H.) analyzed two transcripts independently with data management support through the program Atlas.ti™ 6.0 (Scientific Software, Berlin, Germany). They compared the created codes for inconsistency and agreement, and jointly updated and modified the codebook. Then both investigators independently coded the remaining 32 interviews. Using regular adjudication sessions, the investigators met to modify the codebook, discuss

disagreements, and establish new codes. Finally, the two investigators discussed overarching themes and selected exemplary quotations. Member checking, a common technique to support validity of content analysis, was performed by two interviewees to assess if the data matched their experience.²⁴ The study was exempt from further review by the IRB at the University of Pittsburgh and each institution.

RESULTS

Participants' Characteristics and Key Findings

In total, 34 interviews were completed, with a minimum of three interviews from each institution. Participants were predominantly associate or full professors (51 %), averaged 14 years (range, 1–42) of academic experience, the majority had not received formal education on bedside rounds (74 %), and on average, performed bedside rounds with 62 % of patients. Key themes and principles were identified within the following domains: 1) preparation strategies, 2) patient selection, and 3) role allocation during bedside rounds.

PREPARATION STRATEGIES

Nearly all bedside teachers identified preparation strategies for two distinct groups: 1) the attending physician (Appendix 2) and 2) trainees (Table 1). The strategies were grouped into higher order categories, which are presented here.

Table 1. Preparation Strategies for Bedside Rounds Utilized by Bedside Teachers from Ten US Academic Institutions (n=34)

Attending Physician Preparation of Trainees
Trainee buy-in Organizes orientation meeting at the start of rotation Provides overview and motivations for bedside rounds Cites literature on patient preferences ^{5,36} Requests feedback on length and flow of encounters
Roles and expectations Reviews anticipated days of week for bedside rounds (typically post-call) Identifies roles during encounters (e.g. introductions, case presentations, exam) Sets expectation for case presentation length/format (cites literature, provides handout) ³⁷ Reviews patient selection process, offers opt-out for patients with sensitive issues Requests minimizing interruptions during encounters Reviews positioning of team at bedside (e.g. examine from right side, direct discussion to patient)
Communication and patient comfort Requests patient prior approval for bedside rounds Reviews desired bedside actions to ensure respect/dignity Reviews expectation to avoid medical jargon and impersonal/third-person terms Describes efforts to actively involve patient (e.g. elicit questions or corrective information)
Trainee guidance Selects ideal patient(s) for first bedside rounding experience Leads initial encounters, demonstrating desired actions Discusses goals of encounter prior to entering room Requests trainees identify areas for teaching immediately prior to entering room

Attending Physician Preparation Strategies

Four main areas required for attending physician preparation were identified:

1. Trainee-specific. During an orientation meeting at the rotation's start, attending physicians often sought trainees' learning objectives, to be used as a guide for rounding sessions. For example, one attending physician stated: "Trainees identify their own learning goals and needs. Simply asking to identify a learning goal is not specific, so I push them to crystalize something that's more helpful. We'll tailor our bedside teaching to that." Another exemplary comment of the need to engage the learner was: "They want to work on their history or exam skills, so they feed into it. I say, 'If that is one of your goals, that is one of my goals'."
2. Disease-specific. Through review of the electronic medical record (EMR) or discussion with residents prior to rounds, attending physicians identified diagnoses with which they felt less comfortable, and reviewed these using online resources. This preparation helped create teaching points or scripts for rounds: "If it's something I do not feel comfortable with, then I'll do some background reading or pull a recent article."
3. Patient-specific. Prior to rounds, nearly all attending physicians reviewed written notes, EMR, and if possible, evaluated patients directly. Using this information along with team learning objectives, many attending physicians prepared teaching points: "I look up information on the patient, [such as] lab data and procedure results from the previous day. I decide what I am going to focus on and prepare a couple of questions on each patient to make it more meaningful for the team."
4. Mental preparation. Some attending physicians highlighted the need to mentally prepare for rounds to achieve pre-set goals: "I have to get centered before I round with the team. I need to be thinking of the group dynamic around the patient's bedside. I need to be focusing on multiple different things at the same time, which means before I start rounds, I've got to center myself so that I can be fully present." This preparatory step allowed for "an intellectual scaffolding about what needs to be attended to and to make sure we're not missing anything. Rounding is a very complex task. There is wisdom that needs to be applied."

Trainee Preparation Strategies

During the team orientation session, nearly all attending physicians used several strategies to prepare trainees for bedside rounds.

1. Seek trainee "buy-in." At the orientation session, many attending physicians described his or her motivations

for bedside rounds, seeking trainee buy-in to participate. Noting bedside rounds are atypical for most trainees, this formal introduction served as an icebreaker, preparing them for the change in their routine. One representative comment was: “Bedside rounding is an unusual occurrence for residents. There needs to be a degree of buy-in among residents. We talk about goals and expectations, and I tell them one of my goals is to spend time learning at the bedside. We talk about how to do it well, how to present, and [prepare] them for feedback.” Many attending physicians identified trainees’ initial apprehensions and sought to relieve their anxieties. One attending stated: “I give a pep talk to relieve anxiety and reassure them. I point out patients like it and it offers the patient the opportunity to see [we] are thinking about their problems and making plans.”

2. Define roles and expectations. Attending physicians discussed the roles of each team member and what to expect during bedside encounters. A bedside teacher stated: “[We discuss] who should be presenting, what kind of information is presented, how long that will take, and who leads discussions and completes the problem list because that drives the daily plan.” Steps in the bedside encounter are explicitly reviewed: “[We review] who walks in first, [and identify] interesting findings or things they want to [review] when we see the patient.” To accomplish the educational goals during bedside rounds, attending physicians identified the importance of creating a safe learning environment for trainees. One attending physician prepared trainees to anticipate questions: “I say, ‘When you’re done present[ing], I’m going to ask questions. It’s not a matter of me saying you don’t know, it’s getting your brain thinking about different paths you can take.’”
3. Establish a climate that fosters patient comfort and communication. Communication and patient comfort was addressed by many attending physicians as a specific focus during “roles and expectations” preparation. Particularly with trainees new to the process, bedside teachers recognized potential negative ramifications of bedside rounds without patient-centered behaviors demonstrated by team members. To avoid these negative consequences, attending physicians reviewed appropriate bedside actions. One attending stated: “I prep them for the most appropriate and patient-centered ways to do bedside rounds and minimize patient discomfort. I tell them to sit on the edge of the bed, pull a chair out, cover them back up, put their TV back on.” Attending physicians sought to ensure patients have the opportunity to contribute and ask questions. An exemplary comment included: “I expect the patient to be involved, so they may ask questions or make commentary to the discussion.” To

optimize patient inclusion, attending physicians recommended to trainees: “Speak to the patient, not the team, using terms they understand. Explain you are going to present their story and they are free to chime in and correct information.”

4. Tailor bedside activities to the experience of trainees. Since many trainees are unfamiliar with bedside rounds, attending physicians performed a number of activities to assist in the early transition. At the start, attending physicians identified patients for encounters that would most likely be successful and often role-modeled preferred activities. One attending physician stated: “[At the start], residents are just trying to figure out where stuff is, do you know the term deer in headlights? Before we get into the room, I select the first patient, someone who is not going to be hard.” Another attending physician stated: “With new teams, I run bedside rounds the first couple days. I take the lead, introduce everybody, and show them how to talk in front of patients.” Attending physicians believed the skills required to coordinate bedside rounds could be difficult for new junior resident trainees: “If they’re a new resident, I might take the leader role initially to show them what I expect.”

PATIENT SELECTION PROCESS

Primarily through collaboration with house staff, attending physicians frequently prioritized patients for selection and deferment from bedside rounds (see Table 2).

Table 2. Prioritization of Patients Chosen For and Deferred from Bedside Rounds by Bedside Teachers from Ten US Academic Institutions (n=34)

Priority for Patient Selection	Patient description or factor
Definitely perform bedside rounds	Sick patients requiring immediate care New admissions to team Post-call days
Likely to perform bedside rounds	Clinical-decision making required High educational value for trainees Geographic considerations
Variable (depending on time and patient census)	Patients pending discharge House staff preference
Likely to defer bedside rounds	Clinically stable patients with low educational value Sensitive issues anticipated in discussion Patient on contact or respiratory isolation
Definitely defer bedside rounds	Patient not available (e.g. off floor for testing) Patient status impairs adequate communication (e.g. if obtunded) Unwilling patient

Patients Preferred

Attending physicians selected patients for bedside rounds based primarily on clinical care issues such as patient acuity, and systems factors, including post-call days and geographic location of patients. For nearly all participants, urgent issues received top priority: "First, we need to see anyone with emergent situations, the [patients] house staff feel are the sickest." Primarily on post-call days, since the diagnosis, management plan, and patient-team introductions have not been finalized, new admissions are chosen for bedside rounds: "For quality of care, I see the patients I am not sure what is going on with them, the new ones first." Additionally, "New patients need to know [their caregivers] from the get-go." Next, patients with challenging diagnoses or high educational value are chosen: "We round on patients with challenging medical conditions. If there is a patient house staff want to talk about because of an [unfamiliar] issue, we round at the bedside." Notably, in difficult situations, educational benefit could still occur: "We talk about [sensitive issues] outside the room, but we still go in as a team. There is still something to be gleaned. [Trainees] see an expert history, exam, or key thing to illustrate a point. I try to role model a positive learning experience for them."

Patients Deferred

Primary reasons for deferring patients included lack of patient preference or inability to communicate, such as patients with altered mental status or who were non-English speaking: "There has to be a general sense of the willingness of the patient to participate." Bedside teachers respected sensitive situations where group discussion may be detrimental: "A new diagnosis of a life-threatening condition or a disease with stigma, such as advanced cancer, AIDS, an STD, [or unexpected] pregnancy, we won't discuss that in front of the patient." Encounters unlikely to proceed efficiently, such as "difficult" patients, were deferred: "Drug-seeking behavior, adjustment disorder or a patient being demanding, we may go to the bedside, but we limit [it]." Lastly, unavailable, clinically stable, or patients awaiting transfer were deferred: "Patients aren't in the room, they're at a procedure. Some patients are stable and awaiting transfer. If we're short on time, [we] see those patients outside of rounds."

ROLE ALLOCATION DURING BEDSIDE ROUNDS

Here, we highlight attending physicians' and trainees' roles during bedside encounters. We identified six key steps during bedside encounters: introductions, case presentation, physical examination, assessing patient comfort, case discussion, and closing (Table 3). Roles during bedside

encounters varied between and for each participant: "I've seen everyone run [rounds], from students to me. It depends on the abilities of house staff and team dynamics."

Attending Physician Role During Bedside Rounds

Attending physicians viewed their role as: 1) team leader or 2) consultant.

Some attending physicians sought the leadership role: "If I haven't examined a new patient, then I lead. [House staff] have many things to worry about. Running rounds could distract from their work. I try to make it efficient and high yield." Often, attending physicians delegated control to house staff: "[I tell the patient], this is the team and your intern who you've been working with. They will tell you what is going on."

Alternatively, some bedside teachers wanted house staff to direct encounters: "The patient needs to see [the trainee] as the one responsible for them. They should be taking the lead." These attending physicians defined their supportive role: "My function is strictly as a teacher or consultant. I stand in the background and provide collateral information or consultation." Attending physicians provided support: "If things need to be brought up or if [there are] uncomfortable situations, they can turn it over to me." Despite their "consulting style," attending physicians were often active at the end of encounters: "That's [when] I chime in, if the symptom needs elaboration, I ask questions to the patient directly."

In both attending physician roles, the physical exam was the primary area where they lead: "Physical exam teaching is done by me, as opposed to the resident. I focus on useful physical exam findings to illustrate a point. I show them something they probably observed but didn't quite realize the significance."

Senior Resident Role

Attending physicians identified that residents may lack confidence assuming the leadership role: "For residents early in their junior year or some quieter residents who aren't grabbing the reins, I am more hands on at driving the conversation." In reference to stressful situations: "Some residents are not comfortable with it, they get bent out of shape if there is a high stress situation. But I push them to oversee this."

With progressive trainee experience, residents primarily coordinated encounters and rounding sessions: "[Residents] are on top of issues, they know who has clinic or is post-call. They dictate where we start, who we see first. They lead us into the room, introduce everybody, talk to the patient and ask questions, and [help] lead the examination." Residents were viewed as co-leaders: "The resident and I are both leading rounds. I make it clear I want the resident

Table 3. Steps During Bedside Encounters Reported by the Bedside Teachers in Composite Format (n=34) from Ten US Academic Institutions

Steps during Bedside Encounter	Quotation
Opening	
Introductions	"Whoever is presenting the patient walks in first, then everyone walks in, and I usually walk in last. I try to get the interns to be the conductors when we enter. The intern then introduces me as the attending responsible for their care. [We] always say hello to the patient and acknowledge anybody else there—spouse, children, friends."
Patient preparation	"[We review] what the patient could expect, 'Dr. so and so is going to tell us what they found in between yesterday and today.' It's an introductory statement about what's going to happen. I acknowledge [our] talk is going to be jargon laden, but I promise that we'll bring them up to speed."
Encouraging patient participation	"[We tell patients], 'When we're done, if you have comments, questions or anything you can add, we would be very happy to hear from you'."
History of present illness (HPI)/Case Presentation	
Synopsis of case by junior trainee	"I almost never start interactions without hearing the case presentation from a trainee first. [They are] the presenter and the transmitter of information. We basically do an overnight SOAP (Subjective, Objective, Assessment and Plan), summarizing overnight and morning care. That allows for more efficient and shorter rounds."
Physical Examination	
Focused physical examination component performed and reviewed	"We don't do full physical exams. It is very rare that with the entire team [we] do a head to toe exam. We'll highlight findings or questions that [residents] identified before rounds. I lead the exam and model the jugular venous pressure (JVP) on this person, modeling of physical examination."
Assessing Patient Comfort	"When doing physical things, [we] think about patient modesty and attend to patient comfort. We moisten their mouth, get them water, straighten their bed, lift them up. When we leave, we turn the lights back out, put everything back the way we found it."
Discussion	
Pertinent to case (clarifying exam or history points)	"[It is] often a collaborative effort when we teach directly off of the patient. After [house staff] are done talking to the patient, if I want to elicit anything from the patient, that's when I'll jump in and add teaching points I want to make."
Daily management plan	"[We] go over the plan with the patient. If [the team] comes to rounds with basic knowledge of the patient, [we] can efficiently hone in on the assessment and plan. You can color it with the most updated labs, results, and consultations."
Closing	
Check for understanding, opportunity for questions	"I end bedside rounds looking for patient understanding by asking: 'We've talked a lot about you, used some medical terms, but do you understand the main plan for today?'"
Closing thoughts	"I offer a summary at the end if a point needs to be clarified, maybe adding affectation or qualification to what has been said. If the patient [is] still a little confused, I will usually get the last word."

to run this, get comfortable talking to patients. After the presentation, I look to the resident for teaching points." Attending physicians believed: "This is part of training in how to do bedside rounds for residents."

Intern and Student Role

Interns and students' primary role was performing case presentations: "The intern or student, whoever is the primary provider for that patient, is doing the case presentation." Some attending physicians sought to increase intern duties, particularly later in the year: "I encourage seniors to ask interns to [lead] as part of their transition to senior resident. It is important for them to make the introductions and be the conductor. In March, the interns will often step right in."

patient-centered strategies, explicitly demonstrated in their preparation for bedside rounds, patient selection, and orchestration of team member roles at the bedside. Many attending physicians elicit trainee-identified learning objectives, seek buy-in, and model initial encounters to ease the team's transition into a likely unfamiliar activity and increase the benefits of the bedside experience. The tailored patient selection process, influenced by patient-specific and external variables of inpatient wards, prioritizes team workflow, trainees' educational needs, and clinical requirements for patients. The roles during bedside rounds are not static, adjusting to the comfort and skill level of trainees, to ensure progressive development of trainee skills, while also ensuring patients' trust in the care team. Employed in the context of clinical work and real-time patient encounters, these strategies create a rich experience-based, workplace learning environment for trainees.

General strategies for successful patient-centered teaching encounters, in both the inpatient and outpatient settings have been proposed by expert medical educators. These techniques, although broadly covering the characteristics of successful teachers, "attending rounds," or the phases of encounters (before, during, after), primarily provide

DISCUSSION

Our interviews reveal that although bedside teachers may practice variable rounding styles, they apply learner and

descriptions of teaching strategies to be used during actual encounters.^{15–17,19,25–27} Our work builds upon this prior knowledge by providing a current and systematic assessment of action items for the “pre-rounding” period, the patient selection process, and the roles taken during inpatient bedside encounters. We emphasize that rather than examining the views of a heterogeneous group of educators, we specifically targeted a homogenous group who perform bedside rounds and are more able to inform our study questions. Collectively, these works offer insight into the most effective bedside rounding models and provide a valuable roadmap for faculty and mentoring efforts aimed at promoting the complex task of bedside rounds.

Essential to their preparatory phase, bedside teachers assess educational needs, review motivations and expectations, and seek trainee buy-in. Similarly, outpatient preceptors in works by DaRosa et al. and Usatine et al. and inpatient bedside teachers in Irby’s work engaged in significant planning prior to instruction, including assessing learners’ needs, orienting learners to their role, discussing cases with residents prior to rounds, and brainstorming instructional “scripts.”^{19,28,29} Bedside teachers in our study, consistent with Irby’s findings, also engaged in mental preparation, highlighting the planning and continuous monitoring required for successful bedside rounding encounters. Less evident from these results are the implicit challenges of coordinating all of the tasks in the bedside rounding process in the often unpredictable workplace environment, issues which deserve consideration for educators prior to embarking on bedside rounding sessions.

We observed that participants in our study were deliberate in the selection of educationally valuable and newly admitted patients and those requiring medical decision-making, as well as in the decision to defer patients who were unwilling, unavailable, or unable to communicate. The selection of patients with educational value confirms findings from prior studies. During outpatient precepting with students and inpatient student teaching rounds, patient selection was based primarily on educational value, existing doctor–patient relationship, and perceived efficiency, with increased importance on disease severity in the hospital setting.^{21,30} Wiese suggests rounding upon the “dire, diagnostic, and discharge” patients first; our results support the former two, with lower priority given to “discharges.”³¹ Our somewhat dissimilar findings likely reflect differences in study settings (inpatient vs. outpatient), trainee type (inpatient team vs. student), and that our attending physicians were also the “attending-of-record,” requiring a balance of clinical care demands with educational responsibilities. In an already compressed workday, medicine teams do not perform bedside rounds on all patients, utilizing a unique patient selection process that reflects real-time experiences encountered by both trainees and

attending physicians. As reported by our participants and in prior studies, a non-trivial number of patients are excluded from bedside rounds, which may imply to trainees and possibly to patients and families a perceived lack of educational value or “worth,” meriting further exploration.

The attending physicians also seek to define trainee-specific learning plans, tailor teaching to learning goals, and progressively delegate control to house staff during bedside rounds, strategies embedded in an authentic workplace environment.^{32,33} Bedside rounds facilitate the linkage of prior knowledge to clinical encounters in a learner centered manner, promoting focused skill development, autonomy, and growth. Further, by closely monitoring their trainees in practice and providing real-time feedback, attending physicians are able to appropriately regulate each trainee’s assumption of increasing responsibility. In this way, bedside rounds enable enriched, experience-based, workplace learning that fosters the development of trainee competence, notably in a time when sufficient educational workplace learning opportunities may be lacking.^{11,34,35}

This study has several limitations. Although all attending physicians met the inclusion criteria, each had different bedside rounding styles, limiting the identification of a “unified model” for bedside rounds. Nonetheless, we uncovered strategies that were used in common, regardless of the style used to implement bedside rounds. As we were interested in understanding strategies used during bedside rounds to establish a model, we recognize that we did not explore the strategies used by inexperienced physicians to identify any areas of commonality or difference. Furthermore, the identification of our participants was done by individuals at the recruited institution, and we did not have independent verification of their expertise. Lastly, all institutions were large academic centers and may not be generalizable to smaller teaching programs.

Our study shows that experienced bedside teachers implement learner and patient-centered strategies during the preparatory phase, patient selection process, and allocation of roles for bedside rounds. Still possible in the 21st century, bedside rounds can promote effective teaching behaviors while successfully delivering patient care.

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REFERENCES

1. Holmboe ES, Sherbino J, Long DM, Swing SR, Frank JR. The role of assessment in competency-based medical education. *Med Teach*. 2010;32(8):676–682.
2. Horwitz RI, Kassirer JP, Holmboe ES, et al. Internal medicine residency redesign: proposal of the Internal Medicine Working Group. *Am J Med*. 2011;124(9):806–812.
3. Frank JR, Snell LS, Cate OT, et al. Competency-based medical education: theory to practice. *Med Teach*. 2010;32(8):638–645.
4. Gonzalo J, Heist BS, Duffy BL, Dyrbye L, Fagan MJ, Ferencich G, Harrell H, Hemmer P, Kernan W, Kogan J, Rafferty C, Wong R, Elnicki DM. The Value of Bedside Rounds – A Multi-Center Qualitative Study. *Unpublished manuscript*. 2012.
5. Gonzalo JD, Chuang CH, Huang G, Smith C. The return of bedside rounds: an educational intervention. *J Gen Intern Med*. 2010;25(8):792–798.
6. Gonzalo JD, Masters PA, Simons RJ, Chuang CH. Attending rounds and bedside case presentations: medical student and medicine resident experiences and attitudes. *Teach Learn Med*. 2009;21(2):105–110.
7. Gonzalo J. The Return of Bedside Rounds. *J Gen Intern Med* Nov 9 2010. doi:10.1007/s11606-010-1563-y.
8. Payson HE, Barchas JD. A time study of medical teaching rounds. *N Engl J Med*. 1965;273(27):1468–1471.
9. Tremonti LP, Biddle WB. Teaching behaviors of residents and faculty members. *J Med Educ*. 1982;57(11):854–859.
10. LaCombe MA. On bedside teaching. *Ann Intern Med*. 1997;126(3):217–220.
11. Myers JS, Bellini LM, Morris JB, et al. Internal medicine and general surgery residents' attitudes about the ACGME duty hours regulations: a multicenter study. *Acad Med*. 2006;81(12):1052–1058.
12. Nair BR, Coughlan JL, Hensley MJ. Impediments to bed-side teaching. *Med Educ*. 1998;32(2):159–162.
13. Ramani S, Orlander JD, Strunin L, Barber TW. Whither bedside teaching? A focus-group study of clinical teachers. *Acad Med*. 2003;78(4):384–390.
14. Williams KN, Ramani S, Fraser B, Orlander JD. Improving bedside teaching: findings from a focus group study of learners. *Acad Med*. 2008;83(3):257–264.
15. Janicik RW, Fletcher KE. Teaching at the bedside: a new model. *Med Teach*. 2003;25(2):127–130.
16. Kroenke K. Attending rounds: guidelines for teaching on the wards. *J Gen Intern Med*. 1992;7(1):68–75.
17. Ramani S. Twelve tips to improve bedside teaching. *Med Teach*. 2003;25(2):112–115.
18. Irby DM. Three exemplary models of case-based teaching. *Acad Med*. 1994;69(12):947–953.
19. Irby DM. How attending physicians make instructional decisions when conducting teaching rounds. *Acad Med*. 1992;67(10):630–638.
20. Irby DM. What clinical teachers in medicine need to know. *Acad Med*. 1994;69(5):333–342.
21. Gierk B, Harendza S. Patient selection for bedside teaching: inclusion and exclusion criteria used by teachers. *Med Educ*. 2012;46(2):228–233.
22. Bernard HR, Ryan GW. Analyzing qualitative data: systematic approaches. Los Angeles Calif: Sage; 2010.
23. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3:77–101.
24. Fraenkel JR, Wallen NE. How to design and evaluate research in education. 7th ed. New York, NY: McGraw-Hill; 2009.
25. Ende J. What if Osler were one of us? Inpatient teaching today. *J Gen Intern Med*. 1997;12(Suppl 2):S41–S48.
26. Roy B, Castiglioni A, Kraemer RR, et al. Using Cognitive Mapping to Define Key Domains for Successful Attending Rounds. *J Gen Intern Med*. Jun 22, 2012.[Epub ahead of print].
27. Sutkin G, Wagner E, Harris I, Schiffer R. What makes a good clinical teacher in medicine? A review of the literature. *Acad Med*. 2008;83(5):452–466.
28. DaRosa DA, Dunnington GL, Stearns J, Ferencich G, Bowen JL, Simpson DE. Ambulatory teaching “lite”: less clinic time, more educationally fulfilling. *Acad Med*. 1997;72(5):358–361.
29. Usatine RP, Nguyen K, Randall J, Irby DM. Four exemplary preceptors' strategies for efficient teaching in managed care settings. *Acad Med*. 1997;72(9):766–769.
30. Simon SR, Davis D, Peters AS, Skeff KM, Fletcher RH. How do precepting physicians select patients for teaching medical students in the ambulatory primary care setting? *J Gen Intern Med*. 2003;18(9):730–735.
31. Wiese J, American College of Physicians. Teaching in the hospital. Philadelphia, Pa: American College of Physicians; 2010.
32. O'Brien B, Teherani A. Using workplace learning to improve patient care. *Acad Med*. 2011;86(11):e12.
33. Illeris K. Workplace learning and learning theory. *J Work Learn*. 2003;15(4):167–178.
34. Daelmans HE, Hoogenboom RJ, Donker AJ, Scherpbier AJ, Stehouwer CD, van der Vleuten CP. Effectiveness of clinical rotations as a learning environment for achieving competences. *Med Teach*. 2004;26(4):305–312.
35. Dornan T, Boshuizen H, King N, Scherpbier A. Experience-based learning: a model linking the processes and outcomes of medical students' workplace learning. *Med Educ*. 2007;41(1):84–91.
36. Lehmann LS, Brancati FL, Chen MC, Roter D, Dobs AS. The effect of bedside case presentations on patients' perceptions of their medical care. *N Engl J Med*. 1997;336(16):1150–1155.
37. Zwillich C. Bedside rounding combines medical education and patient care. *Hospitalist: ACP*; 2008.
38. Simel DL, Rennie D, Keitz SA. The rational clinical examination: evidence-based clinical diagnosis. New York: McGraw-Hill; 2009.

APPENDICES

Tables 4, 5

Table 4. Participating Institutions and Interview Questions Used with 34 Faculty Physicians from Ten US Academic Medical Centers, 2010–2011

Participating Institutions	
University of Pittsburgh School of Medicine	Pennsylvania State University College of Medicine
Alpert Medical School of Brown University	Perelman School of Medicine, U. of Pennsylvania
Loma Linda University School of Medicine	Uniformed Services University of the Health Sciences
Mayo Clinic College of Medicine	University of Florida College of Medicine
Michigan State U. College of Human Medicine	Yale University School of Medicine

Example Interview Questions

Close-ended survey questions:

Please state your name.

What is your position in the General Internal Medicine division? (open-ended)

Assistant professor	Chair/chief
Associate professor	Program director/associate program director/clerkship director
Professor	Other

How many years have you been practicing in academic medicine? (open)

Did you receive formal education about bedside rounds during the following periods in your career?

Internship/residency – y/n

If yes, in what format was this education provided?

Fellowship (if applicable) – y/n

If yes, in what format was this education provided?

Faculty position – y/n

If yes, in what format was this education provided?

How many weeks in the previous 2 years were you the “attending of record” with house staff? (open)

In an average week of 5 rounding days, how many days do you perform at least one bedside rounding encounter?

Open-ended questions:

How do you prepare for bedside rounds?

How do you select patients upon which you will bedside round?

Who runs the bedside encounters?

What patients do you defer bedside rounds?

Follow-up: Do you ever defer bedside rounds because of the learner who is presenting?

Think about a successful bedside rounding encounter that you had as a teacher or learner. Please share it with me.

Follow-up: What made the encounter successful?

Think about an unsuccessful bedside rounding encounter that you had as a teacher or learner. Please share it with me.

Follow-up: What made the encounter unsuccessful?

Closing Question:

Do you have any closing remarks? Anything else you would like to say that we did not cover in this time?

Table 5. Preparation Strategies for Bedside Rounds Utilized by Bedside Teachers from Ten US Academic Institutions (n=34)**Attending Physician Preparation****Trainee-specific**

Receives feedback from outgoing attending physician about trainees' needs

Identifies trainees' learning objectives (knowledge areas, exam components, etc.)

Meets with senior resident prior to rotation to discuss roles and goals

Disease-specific

Reviews less familiar disease processes

Reviews diagnostic/therapeutics of disease process (e.g. UpToDate®, JAMA Rational Clinical Exam³⁸)

Makes handouts for rounds or teaching session

Patient-specific

Listens to sign-out prior to rounds

Reviews EMR, notes, and diagnostics the evening prior to or morning of rounds

Discusses with resident (on admitting night or in morning)

Evaluates patients prior to rounds

Makes cards with lab values/vital signs for review during rounds

Prints overnight admission note and brings to rounds

Mental Preparation

Reviews how encounters should be accomplished to ensure education and patient comfort

Identifies patients on list with higher and lower educational value for trainees

Active listening or questioning during encounters to prepare for subsequent teaching points

Prior to rotation and throughout year, reviews physical exam skills to be taught during bedside rounds