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WEB PAPER

# Teaching strategies used by internal medicine residents on the wards

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## Abstract

**Background:** Residents serve as teachers to interns and students in most internal medicine residency programs.

**Aim:** The purpose of our study is to explore what internal medicine residents perceive as effective teaching strategies in the inpatient setting and to formulate a guideline for preparing residents to lead their ward teams.

**Methods:** Housestaff identified as excellent teaching residents were recruited from a large internal medicine residency program. Focus groups were formed and interviews were conducted using open-ended questions. Transcripts of the interviews were reviewed, analyzed, and compared for accuracy by two investigators. The transcripts were then coded to categorize data into similar subjects from which recurrent themes in resident teaching were identified.

**Results:** Twenty-two residents participated in four focus group interviews held in 2008. We identified five principal themes for effective teaching by residents: (T)aking advantage of teaching opportunities, (E)mpowering learners, (A)ssuming the role of leader, (C)reating a learning environment, and (H)abituating the practice of teaching.

**Conclusion:** Strategies for effective teaching by residents exist. The TEACH mnemonic is a resident-identified method of instruction. Use of this tool could enable residency programs to create instructional curricula to prepare their residents and interns to take on the roles of team leaders and teachers.

## Introduction

Internal Medicine (IM) housestaff have an important role in education during residency, performing as both learners and teachers. In most IM residency training programs in the United States, second-year residents assume a new role as team leader and are expected to conduct work rounds on the inpatient medical wards. Typically, this transition to resident team leader occurs with very little specific training (Morrison et al. 2001). Team leadership is important in helping residents mature into a "decision-making" role after internship where they now are directly in charge of the interns, with attending physicians playing a more supervisory role on the inpatient teams. This maturation is crucial for the successful training of housestaff as well as other health professional members of the team as residents also act as teachers during residency (Brown 1970; LaPalio 1981; Bing-You & Tooker 1993). These two important roles help residents learn to accept more responsibility while serving as leaders and teachers during their training (Tonesk 1979; Wilkerson et al. 1986).

Research shows that without educational support during residency, residents' teaching skills do not improve in relation to their clinical competence (Edwards et al. 1988). Furthermore, IM residents experience conflicts inherent to their simultaneous commitment to learning, teaching, and service that may undermine both their effectiveness in supervising interns and their own professional development (Yedidia et al. 1995). Unfortunately, the defined teaching strategies in medicine have been extrapolated mostly from observations of attending physicians (Irby 1978, 1994; McLean 2001; Torre et al. 2005), with none focusing on residents themselves as the teachers. Indeed, attending physicians and residents face different challenges in education under current duty hour restrictions, and the teaching strategies used by both may be divergent due to this (Coverdill et al. 2011). A recent study involving faculty, residents, and medical students demonstrated that significant differences exist between faculty

### Practice points

- Ideas regarding effective teaching during residency exist and are shared by residents.
- Effective teaching during residency is important for the successful operation of a medicine inpatient service with regards to patient care, housestaff training, and resident well-being.
- The learning environment created by the resident as the medical team leader is a crucial component of fostering productive learning on the wards.
- The concept of empowering learners is a novel yet simple teaching technique used by residents.
- Self-knowledge of teaching is an important concept for both teachers and learners to be aware of in medical education.

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and residents in both their learning and teaching preferences (Jack et al. 2010).

The demand and importance for training residents to be clinician-educators appear to be on the rise; at a national scientific meeting in the United States held in 2009, many leaders in medical education convened for a workshop and developed a framework for IM residency programs to follow in the design and implementation of clinician-educator curricula for housestaff (Heflin et al. 2009). Current residents-as-teachers curricula are promising for improving residents' teaching skills (Hill et al. 2009), but none have actually defined the specific teaching strategies that are most valued by residents. The purpose of this study is to evaluate residents' perceptions of their role as teacher and team leader during residency in order to help identify strategies for improving a resident's teaching effectiveness.

## Methods

### Study design

We performed a qualitative study utilizing focus groups of IM residents to investigate their perceptions of effective teaching strategies. This study was approved by the Committee on Human Research at the University of California, San Francisco and the San Francisco Veterans Affairs Medical Center.

### Study population and sampling

Current and recent former housestaff who were recognized as excellent teaching residents were recruited at a single IM residency program. Housestaff were identified as excellent teaching residents either by election to chief residency or by selection for various teaching awards. Next, a "snowball" sampling technique was used to identify further housestaff who did not meet the above criteria. Further sampling by this technique occurred by asking focus group members to name other residents they considered to be outstanding teachers. Sampling stopped once the list of residents generated in our study matched the names of those identified by study participants.

### Data collection

Focus group interviews were held in a private setting in October 2008 and audiotaped. The focus group moderator (Dustin T. Smith) was a fellow resident at the time of this study. Trained in qualitative interviewing techniques, the peer moderator began by asking open-ended questions and utilized prompts to encourage group discussion about teaching strategies used during residency among the study participants. Occasionally, reflective probes were employed by the moderator to encourage respondents to clarify and expand on their statements and any areas of ambiguity that arose during the interviews. All interviews were transcribed verbatim.

### Data analysis

The transcripts were reviewed with the audiotapes and checked for accuracy. We performed a qualitative content analysis of the data within the transcripts. Content analysis allows researchers to examine text for the purpose of identifying and grouping themes by using methods such as coding, classifying, and developing categories based on the content within the text (Pope & Mays 1995). Two investigators (Dustin T. Smith and R. Jeffrey Kohlwes) independently analyzed the transcripts and created codes to denote the study participants' statements. Similar topics were then categorized together and a coding scheme emerged. All discrepancies in coding were discussed by the two investigators until a consensus was reached regarding the assignment of each code. From the coding generated, dominant themes in resident teaching were identified. The authors agreed on representative quotes for each theme.

## Results

A total of 40 current or former IM residents were invited for this study, and 22 residents participated in four focus groups held in October 2008. Characteristics of the study participants are presented in Table 1.

### Major themes

Participants from this study described many teaching strategies during the focus group interviews (Table 2). Five principal themes for effective teaching by residents were identified through analyses of the interviews: (A)ssuming the role of leader, (C)reating a learning environment, (T)aking advantage of teaching opportunities, (E)mpowering learners, and (H)abituating the practice of teaching (Table 3).

### Assuming the role of leader

The ability to assume the role of team leader was a dominant theme with residents citing role modeling and professionalism

**Table 1.** Characteristics of study participants.

| Characteristic | Participants ($n = 22$) |
|---|---|
| Gender | |
| Male | 14 (64%) |
| Female | 8 (36%) |
| Race or ethnic group | |
| White | 14 (64%) |
| Black | 1 (5%) |
| Asian | 7 (31%) |
| Current training level | |
| PGY-3 | 15 (68%) |
| PGY-4 | 6 (27%) |
| Attending physician | 1 (5%) |
| Chief residency or teaching award | |
| Future chief resident | 4 (18%) |
| Current chief resident | 3 (14%) |
| Teaching award | 4 (18%) |
| Career choice | |
| Primary care | 6 (27%) |
| Subspecialty | 16 (73%) |

*Note*: Data are presented as number (percent). PGY, postgraduate year.

as necessary attributes to gain the respect of one's learners and peers. This is demonstrated by the following quote: "I think the modeling is a huge percentage of resident teaching." Residents also commented on the importance of setting both team and individual expectations as team leader. The concept of daily pre-planning before rounds was highly stressed by housestaff in our study. In addition, residents noted the importance of attitude in determining how they were perceived as leaders and also how meaningful their teaching would be. One resident conveyed: "The demeanor and personality of the team leader sets the tone for the whole month and the whole team."

Finally, study participants felt residents should be skilled at recognizing the knowledge deficiencies of learners. They noted that the ability to understand when team members were uncomfortable with a topic enabled them to teach more effectively. They felt that in order to fix knowledge deficits, the resident as team leader first had to recognize when these gaps in knowledge were present.

## Creating a learning environment

Another common theme noted was the necessity of creating a supportive learning environment. Residents identified four behaviors to achieve this: make the working environment positive, practice effective time management, maintain intellectual honesty, and give useful feedback. Residents also stressed the importance of finding an appropriate balance of work and teaching while on rounds by showing respect for learners' roles and time. One resident underscored how to optimize time while on work rounds:

> It's balancing work and teaching, you have to be there at that patient's bedside anyway. You have to. There's no getting around it. So either you teach around [the patient] or you don't teach that day because you're too busy.

Another resident suggested "trying to decompress the morning as much as possible" in order to decrease the anxiety and stress the interns feel to complete their work. A different resident highlighted the importance of creating a learning environment:

> Nobody learns when they don't want to be there. You can waste all your time teaching. Especially if interns have pages they have to answer, they could care less about what you're saying. There has to be a real respect for their work for effective teaching to occur.

Besides effective time management, residents felt creating an atmosphere of intellectual honesty was necessary to achieve

**Table 2.** Representative quotes by dominant themes in resident teaching.

| | |
|---|---|
| Taking advantage of teaching opportunities | "I think the in-the-moment teaching is key and one thing I would try to do is frame [teaching] around clinical decision-making. So instead of saying, 'Oh, he's got hyponatremia, let's talk about that for five minutes on rounds.' Start from, 'Well, what do want to do about that,' and work backwards, start to probe how peoples' decision-making is being impacted by their fund of knowledge and then you can kind of fill in gaps in their fund knowledge. That way they kind of feel like they're getting work done at the same time that they're learning some stuff."<br>"So, I feel like there's a component of teaching that is important to do at the beginning of rounds and I would always try to do a little bit of that, but then really using the rounds process in and of itself as like an organic kind of teaching mode."<br>"You know kind of stepping out of the room and talking about what your plan is and really using it as an opportunity to teach the process [of medicine] is potentially even more important than that time [formal teaching] you spend at the beginning of rounds teaching." |
| Empowering learners | "When I first started out teaching I had this feeling like I was responsible for all their [team] learning. After a while I started to realize that when I was an intern I had to do a lot of stuff for myself. And that was very nice when I came to that revelation because it took a lot of the pressure off. And it's true."<br>"You can't expect to teach everyone everything. You have to put them in charge of their learning at some point too."<br>"They get to express their opinion which as an intern makes potassium repletion totally worth it." |
| Assuming the role of leader | "If the team leader is stressed out then everyone is stressed out and you are always on edge."<br>"The amount of learning that just happens in terms of watching you approach a patient and your bedside manner; all of that gets transmitted and there is a lot of learning that happens that way."<br>"I think it takes the first several days [of a rotation] to get to know each intern and where they're at [in training]. Up until the point when you've made what is a pretty good assessment, I feel like you're kind of watching them a little more closely, teaching them a little bit more, and calibrating your teaching and your level of involvement as a resident." |
| Creating a learning environment | "My focus was always trying to decompress the morning as much as possible. Because from the moment the interns pick up sign-out, they're very anxious to get work done, and a lot of that work needs to happen in the morning or else people feel stressed all day. I would try and separate formal teaching from the in-the-moment teaching, which is how I learned as an intern. I can't remember a single didactics lecture I went to as an intern because I was too darn stressed out all the time."<br>"Another important thing is making sure the interns realize that you respect their time. They have million things going on in their heads and if you try to teach for the entirety of work rounds, then they are not going to absorb much of [your teaching]."<br>"A component of [how to create a learning environment] is setting the tone and creating an active learning environment where people feel safe enough to ask questions."<br>"I guess the other component of teaching that I think is really important is to really kind of be okay with not knowing [the answer]. I think modeling that as a teacher is actually huge." |
| Habituating the practice of teaching | "You gotta do it [teach]... you just gotta do it to be a good teacher."<br>"I think one thing I didn't realize was that you have to be very deliberate about what you do on rounds. People should be engaged. I have to remind myself if the intern is talking to me and asking me a question that requires data to take that and engage someone else with that information instead of just that intern that I'm talking to. It's deliberate stuff like that which when you do it everyone has to pay attention now. They are all learning from this case instead of me just making a teaching point to that intern." |

**Table 3.** Effective teaching strategies for residents—the T-E-A-C-H mnemonic.

*Taking advantage of teaching opportunities*
- Making formal teaching relevant
  - Patient-centered
  - Framing medical decision-making
  - Emphasizing specific learning points
- Contextual learning
  - Identifying teaching moments
  - Adapting teaching to the environment
  - Effectively choosing topics
  - Bedside teaching
  - Thinking out loud

*Empowering learners*
- Encouraging learners to participate in teaching
  - Assigning tasks
  - Learning and bedside appreciation
- Challenging learners to direct medical decision-making

*Assuming the role of leader*
- Role modeling and professionalism
- Setting team and individual expectations
- Preparation and pre-planning
- Recognizing the knowledge deficiencies of learners

*Creating a learning environment*
- Positive working environment
- Time management
  - Balance of work and teaching
  - Respecting learners' roles and time
- Intellectual honesty
  - Socratic method
  - Teacher humility
- Giving feedback
  - Continuous
  - Real-time

*Habituating the practice of teaching*
- Prioritizing teaching
- Making teaching deliberate
- Being enthusiastic about teaching
- Recognizing learners' perception of teaching

a work environment ripe for learning. Many residents reported practicing the Socratic Method. They felt that although this could be considered a form of "pimping," when practiced artfully it could be a highly effective way to emphasize teaching points. Residents thought that admitting to not knowing information and ensuring that questions were always allowed also helped create a positive learning environment. All residents believed teacher humility was vital to achieve this.

Study participants recognized that ongoing feedback and evaluation also affected the learning environment and were highly effective tools to reinforce learning. Residents stated feedback should be continuous and done in real-time to be effective. Continuous feedback enables resident teachers to capitalize on "teachable moments" where guidance can achieve practice improvement. They also thought making feedback continuous normalized this form of evaluation and allowed team members to be more at ease with constructive remarks on their performance.

## Taking advantage of teaching opportunities

Many residents emphasized the necessity of taking advantage of teaching opportunities while working on the wards. Most were of the opinion that there was a major distinction between formal didactics and contextual learning at the bedside. Some residents tended to favor one approach over the other, but all residents agreed that both modalities had their respective benefits in promoting learning. The caveat mentioned regarding formal teaching dealt mostly with making this form of teaching relevant to the experiences faced by learners on the wards. Residents suggested three ways to do this: keeping the topics patient-centered, framing medical decision-making, and emphasizing specific learning points.

In contrast, residents felt that in order to be successful in contextual learning, there was more reliance on the identification of teaching moments and the adaptability of one's didactics to the work environment. Within contextual learning, it is the situation or context that actually produces the topic and secures its relevance. Residents acknowledged that the critical concept here was deciding which moments to teach from and which ones would be truly effective in promoting learning. Two easy ways to practice contextual learning suggested in this study were to "think out loud" and teach at the bedside. Residents explained the idea of "thinking out loud" to involve speaking through one's thoughts and decision-making process in order to be transparent with the team as medical decisions were being made. The housestaff in our study stressed that this was effective in giving insight to learners who yet had many chances for critical decision-making on the wards. The other suggestion of bedside teaching was had not repeatedly mentioned by residents in this study. One resident highlighted bedside teaching with these comments:

> I feel like walk round teaching and teaching on rounds is something that's very contextual.... So going to see every patient, like using that as a teaching moment to model something. Modeling the physical exam, modeling what you hear and comparing and contrasting it with what students or residents hear on exam.

## Empowering learners

Another theme was empowering learners to participate in their own learning and challenging learners to direct medical decision-making. In the former, residents recognized that assigning tasks to learners that involved having them teach back to the team were successful in both fostering team learning and sharing the responsibility of teaching. A resident shared his experience in empowering his learners:

> If the intern who is presenting seems to know the answer or wants to talk, encourage them to do that and let them do the teaching. I mean, everybody learns, they get confidence and it grooms them for being the resident.

Residents advocated empowering learners by allowing them to direct medical decision-making. They found that giving learners this autonomy and responsibility had a major

impact on their learning and confidence while training. One resident elaborated:

> They'll remember taking that stand [making a decision] and they'll remember whether they were right or not.

### Habituating the practice of teaching

The final dominant theme is the concept of making it a habit to teach. Residents had four specific suggestions to help sow the desire to teach in those practicing on the wards. First, a resident must make teaching a daily priority. Second, a resident needs to be deliberate in his/her actions with regards to teaching. Third, residents have to be enthusiastic about teaching for it to occur effectively. Finally, many residents commented that people were more likely to identify them as good teachers if they worked to support the perception that teaching was occurring. The residents had recognized the usefulness of pointing out when they were teaching and by highlighting learning points. By engaging the team when teaching was occurring, residents then found it easier to proceed as people were in the appropriate frame of mind for learning. One resident concluded with her approach below:

> I think taking something that you're going to have to do anyway like a procedure and prefacing it, 'We're learning now.' You know I think honestly it's being focused on it [teaching] all the time. Having it be a priority . . . having it be a priority in your mind. Finding the teaching moments in the procedure or family meeting or sick patient or whatever and setting up the environment to be a teaching one and making it a priority.

## Discussion

The purpose of this qualitative study was to understand the teaching practices of residents who were identified as superb educators during their residency. To our knowledge, this is the first study of its kind involving focus groups of medical housestaff to define teaching strategies for residents. In our study, excellent teaching residents suggested five general themes to adhere by on the wards (Table 3): assuming the role of leader, creating a learning environment, taking advantage of teaching opportunities, empowering learners, and habituating the practice of teaching.

Educational research has recognized the value of an instructor acting as a leader and role model in order to establish an effective working and teaching relationship with one's learners (Harden et al. 2000). One study involving medical students and residents supported the idea of role modeling as an effective teaching strategy wherein the behaviors of residents were found to be more instructive than a resident simply providing facts on rounds (Wilkerson et al. 1986). The concept of diagnosing the learner, which has been supported by other studies and used in various teaching models (Neher et al. 1992; Spickard et al. 1996; Furney et al. 2001), was alluded to by participants in our study by recognizing or probing for the knowledge deficiencies of learners. As team leader, one must always be prepared and research has shown that adequate preparation before rounds makes one a more organized teacher, which is a quality that is highly appreciated by learners (Irby 1978).

The learning environment created by a teacher is a crucial component of fostering productive learning (Knowles & Associates 1984). One study using medical students emphasized good communication skills as the most important quality of a teacher and also found that learners respond to and are able to communicate better with teachers who are humble, approachable, and helpful (McLean 2001). It is in this type of situation that teachers and learners alike feel comfortable asking questions and at times not knowing the answers. Likewise, a positive work setting then allows for continuous and real-time feedback to occur without the fear of looking bad on the wards. Another study involving medical students demonstrated that high-quality teaching was occurring when feedback was common in the daily workplace (Torre et al. 2005). Feedback has already been validated in numerous studies as an instrument of instruction in medical training (Ende 1983; Bing-You 1993; Litzelman et al. 1998; Furney at al. 2001; Branch & Paranjape 2002).

An important subtopic from our study was that in order to create a mutual working and teaching environment, residents have to practice time management and flexibility. Balancing both work and teaching is crucial for gaining the respect of one's learners as well as engaging them. One study documented that housestaff feel conflicted in their roles as workers, teachers, and learners during residency (Yedidia et al. 1995). Residents in our study found great success in balancing this conflict using time management and flexibility while also demonstrating humility and empathy to their learners and occasionally sharing in their learners' duties.

The theme of how to take advantage of teaching opportunities was a major point of discussion among residents in our study. Similar to above, learners have to be engaged for effective teaching to occur in a busy work setting such as on the medical wards. Learners respond best when formal teaching is made relevant to their daily practice. Likewise, contextual learning has been shown to be a very effective teaching method in medicine (Irby 1994). Unfortunately, one review noted that bedside teaching may be a declining or lost art (LaCombe 1997). Residents in our study had several suggestions, also mentioned in this review, to help improve one's teaching abilities when opportunities arise at the bedside (LaCombe 1997).

A major but simple theme elucidated from our study was the teaching strategy whereby learners are empowered. Principles previously derived from adult learning theory including encouraging learners to formulate their own learning objectives and to take control of their learning are consistent with this theme derived from our study (Knowles & Associates 1984). Most of the data to support giving pupils control or having them take charge of their own learning in medical education comes from medical school curricula reviews such as problem-based learning or nurses' education literature (Knowles 1975; Barrows & Tamblyn 1980; Boud & Feletti 1985; Grundy 1987; Lunyk-Child et al. 2001; Costa et al. 2007;

Laitinen-Vaananen et al. 2007). Residents in our study found this to be a highly effective training strategy during residency, which is a challenging time where trainees, especially interns, are prone to feeling disempowered. By giving back some control with regards to learning and decision-making, this may make the learner more receptive to teaching and overall happier with their experience on the wards. This important subject needs to be examined further in future studies.

The final theme developed in our study deals with making the practice of teaching a habit. Aspects of this included being deliberate about teaching, being enthusiastic about teaching, and being able to recognize learners' perception of teaching. These latter two subthemes have been identified in other qualitative studies (Irby 1978; Morrison et al. 2005). The idea of self-knowledge of teaching or making learners aware that teaching is occurring was a dominant concept mentioned by residents in our study. This notion alludes to the fact that much of the learning that occurs in medical residency comes from "on-the-job" experience.

This study was conducted using qualitative research methods to explore what IM residents perceive as effective teaching strategies for the inpatient setting. This study was not designed to test hypotheses or prove theories. We used a snowball sampling technique which does not produce a random sample and is thus subject to bias. This type of sampling is able to provide a rich sample of subjects with knowledge in the desired area of interest being studied. It is also possible that there is imposition of meanings on our data. Finally, our observations were taken from a small sample of housestaff training in an IM residency program in the United States and may not generalize to other populations.

## Conclusion

Housestaff felt that effective teaching during residency is important for the successful operation of a medicine inpatient service with regards to patient care, housestaff training, and resident well-being. Study participants also articulated many shared beliefs about how to operate as an effective resident teacher and leader during residency. Finally, after analyzing dialogue taken from focus group interviews of excellent resident teachers, we propose a teaching model of effective resident teaching strategies involving: (A)ssuming the role of leader, (C)reating a learning environment, (T)aking advantage of teaching opportunities, (E)mpowering learners, and (H)abituating the practice of teaching – which can be rearranged into the mnemonic, T-E-A-C-H. Although these findings warrant additional study and validation, we feel the use of this tool could potentially guide residency programs in creating instructional curricula to prepare their residents and interns to take on the roles of team leaders and teachers during residency.

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***Declaration of interest*:** The authors report no conflicts of interests.

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