

Five Microskills for Clinical Teaching

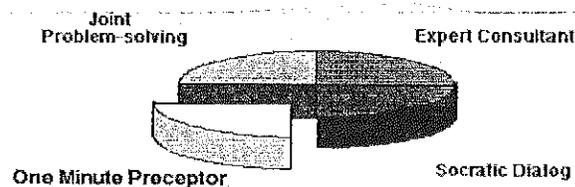
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Most clinical teaching takes place in the context of busy clinical practice where time is at a premium. Microskills enable teachers to effectively assess, instruct, and give feedback more efficiently. This model is used when the teacher knows something about the case that the learner needs or wants to know.

Clinical teachers play several different professional roles: expert consultant, joint problem solver, Socratic teacher, and, when appropriate, the One Minute Preceptor.

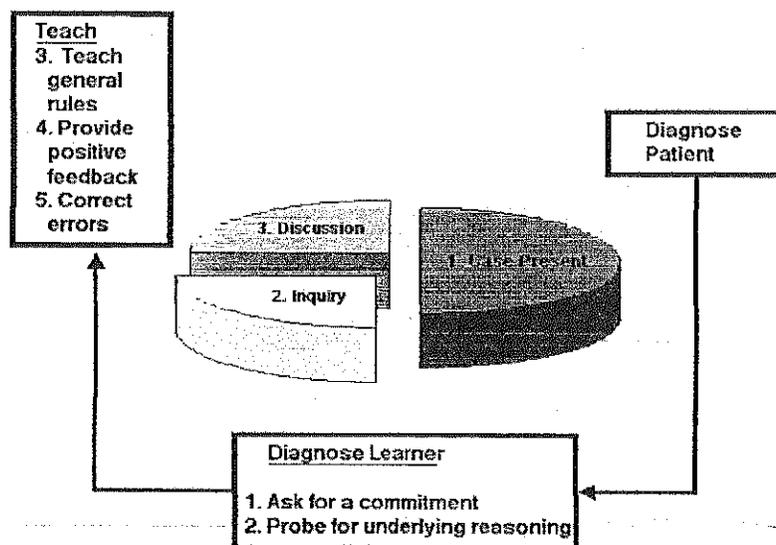


This program defines each component of the One Minute Preceptor and provides opportunities to practice five microskills for clinical teaching:

- Get a commitment
- Probe for supporting evidence
- Teach general rules
- Reinforce what was right
- Correct mistakes

This teaching model is described in: Neher, JO, Gordon, KC, Meyer, B, and Stevens, N. A Five-step "Microskills" Model of Clinical Teaching. *Journal of the American Board of Family Practice*. 5:419-424, 1992.

Teacher Reasoning During Case Presentations and Five Microskills for Clinical Teaching



During case presentations and discussions in ambulatory settings, residents spend 50% of the time presenting the case. Clinical teachers then ask questions (25% of time) and discuss the case (25% of time).

This process is mirrored in the minds of the preceptors. Clinical teachers first focus on diagnosing the patient's problem, then on diagnosing the learner's needs, and finally on providing targeted instruction.

The microskills in this program facilitate this instructional process. The first two microskills 1) Get a Commitment and 2) Probe for Underlying Reasoning diagnose learner knowledge and reasoning. The three microskills 3) Teach General Rules, 4) Reinforce What Was Right, and 5) Correct Mistakes, offer tailored instruction.

For more detailed information see Knudson et al. Analysis of Resident and Attending Physician Interactions in Family Medicine. *Journal of Family Practice*. 28 (6): 705-709, 1989. And Irby, D. How Attending Physicians Make Instructional Decisions When Conducting Teaching Rounds. *Academic Medicine*. 67 (10): 630-638, 1992.

Microskill 1: Get a Commitment

Cue: After presenting the facts of a case to you, the learner either stops to wait for your response or asks your guidance on how to proceed. In either case, **the learner does not offer an opinion on the data presented.** If you recognize the patient's problem, your immediate response is to want to tell the learner the answer.

Preceptor: Instead, you ask the learner to state **what s/he thinks** about the issue presented by the data. Issues may include coming up with more data, proposing a hypothesis or plan, developing a management plan, figuring out why the patient is non-compliant, deciding on whom to consult, etc.

Rationale: Asking learners how they interpret the data is the first step in diagnosing their learning needs. Without adequate information on the learner's knowledge, teaching might be misdirected and unhelpful. When encouraged to offer their suggestions, learners not only feel more of the responsibility for patient care but enjoy a more collaborative role in the resolution of the problem.

Examples

"What do **you** think is going on with this patient?"

"What other types of information do **you** feel are needed?"

"What would **you** like to accomplish in this visit?"

"Why do **you** think the patient has been non-compliant?"

Non-examples

It is not offering your own opinion.

"This is obviously a case of pneumonia."

It is not asking for more data nor is it Socratically leading them to the right answer.

"Anything else?"

"Did you find out which symptom came first?"

Microskill 2: Probe For Supporting Evidence

Cue: When discussing a case, the learner has committed him/herself on the problem presented and looks to you to either confirm the opinion or suggest an alternative. You may or may not agree with the opinion and your instinct is to tell them outright what you think about the case.

Preceptor: Before offering your opinion, ask the learner **for the evidence that he/she feels supports his/her opinion. A corollary approach is to ask what other choices were considered and what evidence supported or refuted those alternatives.**

Rationale: Learners proceed with problem solving logically from their knowledge and data base. Asking them to reveal their thought processes allows you both to find out what they know and to identify where there are gaps. Without this information, you may assume they know more or less than they do, and risk targeting your instruction inefficiently.

Examples

"What were the major findings that led to your conclusion?"

"What else did you consider? What kept you from that choice?"

"What are the key features of this case?"

"What questions are arising in your mind?"

Non-examples

It is not list making nor an oral examination/grilling about the problem.

"What are the possible causes of congestive heart failure?"

It is not a judgment on the student thinking.

"I don't think this is infectious mono. Don't you have any other ideas?"

It is not your own opinion on the case.

"This seems like a classic case of..."

It is not asking for more data about the case than was presented initially.

"What do you know about her previous childbirth?"

Microskill 3: Teach General Rules

Cue: You have ascertained from what the learner revealed that the case has teaching value, i.e., you know something about it which the learner needs or wants to know.

Preceptor: Provide general rules, concepts or considerations, and target them to the learner's level of understanding. A generalizable teaching point can be phrased as: "When this happens, do this..."

Rationale: Instruction is both more memorable and more transferable if it is offered as a general rule or a guiding metaphor. Learners value approaches that are stated as more standardized approaches for a class of problems or as key features of a particular diagnosis.

Targeting your instruction minimizes the risk of misjudging the learner's sophistication on the topic - resulting in either insulting or losing him/her, and wasting both of your time.

Examples

"If the patient only has cellulitis, incision and drainage is not possible. You have to wait until the area becomes fluctuant to drain it."

"Patients with cystitis usually experience pain with urination, increased frequency and urgency of urination, and they may see blood in the urine. The urinalysis should show bacteria and white blood cells, and may also have some rbc's.

Non-examples

It is **not the answer** to a problem (although this may also be needed), rather it is an approach to solving it.

"In this case, it's a good idea to soak the affected area to relieve the tenderness rather than lancing it."

It is not an unsupported, idiosyncratic approach.

"I'm convinced the best treatment for diarrhea with salmonella enteritis is still a liquid or soft diet."

Microskill 4: Tell Them What They Did Right

Cue: The learner has handled a situation in a very effective manner that resulted in helping you, patients, or other colleagues. He/she may or may not realize that the action was effective and had a positive impact on others.

Preceptor: Take the first chance you find to comment on:
1) **the specific good work** and 2) **the effect it had.**

Rationale: Some good actions are pure luck, others are more deliberate. In either case, skills in learners are not

well established and are, therefore, "vulnerable." Unless reinforced, competencies may never be firmly established.

Examples

"You didn't jump into solving her presenting problem but kept open until the patient revealed her real agenda for coming in today. In the long run, you saved yourself and the patient a lot of time and unnecessary expense by getting to the heart of her concerns first."

"Obviously you considered the patient's finances in your selection of a drug. Your sensitivity to this will certainly contribute to improving his compliance."

Non-examples

It is **not general praise**.

"You are absolutely right. That was a wise decision."

"You did that IV preparation very well."

Microskill 5: Correct Mistakes

Cue: The learner's work has demonstrated mistakes (omissions, distortions, or misunderstandings) that have or will have an impact on the patient's care, the team's functioning, or the learner's own effectiveness.

Preceptor: As soon after the mistake as possible, find an appropriate time and place to **discuss what was wrong and how to avoid or correct the error in the future**. Allow the learner a chance to critique his/her performance first.

Rationale: Mistakes left unattended have a good chance of being repeated. By allowing the person the first chance to discuss what was wrong and what could be done differently in the future, you are in a better position to assess both their knowledge and standards.

Learners who are aware of their mistakes and know what to do differently in the future need only to be reinforced.

Learners who are aware of their mistakes but unsure of how to avoid the situation in the future are very likely to be in a "teachable moment" (they are eager for and appreciate tips that will help them get out of or avoid the uncomfortable situation in the future).

Learners who are unaware that they made a mistake or are unwilling to admit the error are more troublesome.

Obviously they have not seen that their action has an undesirable consequence. In order to maximize learning for them, detailing the negative effect as well as the correction are both essential for effective feedback.

Example

"You may be right that this child's symptoms are probably due to a viral upper respiratory infection. But you can't be sure it isn't otitis media unless you've examined the ears."

Non-example

Avoid vague, judgmental statements.

"You did what.?"

The Case of a Painful Ear

A new first year resident presents a case to you while you are attending in the ambulatory clinic. The resident appears to be bright and eager to learn. He says:

Resident: "I just saw a four year-old boy in the clinic with a complaint of ear pain and fever for the past 24 hours. He has a history of prior episodes of otitis media, usually occurring whenever he has an upper respiratory tract infection. For the past two days, he has had a runny nose and mild cough and yesterday, he began to have a low grade fever and complained that his right ear was hurting. His mother gave him Tylenol last night and when he got up this morning. He has no allergies to medication."

"On physical exam, he appeared in no acute distress and was alert and cooperative. His temperature was 38.5 C. His HEENT exam was remarkable for a snotty nose and I think his right tympanic membrane was red, but I'm not sure. It looked different from the left

one. His throat was not infected. His neck was supple without adenopathy. His lungs were clear and his heart had no murmur. I didn't see any rashes or skin lesions."

Preceptor: "This is obviously a case of Otitis Media. Give the child amoxicillin and get him out of here."

<Stop>

Alternative Strategy

Same case presentation by the resident.

Preceptor: "What do you think is going on?"

Resident: "I think he has an upper respiratory infection, probably otitis media."

Preceptor: "What led you to that conclusion?"

Resident: "He has a history of repeated otitis media and currently has a fever, a painful right ear, and a runny nose."

Preceptor: "What would you like to do for him?"

Resident: "First, I would like you to confirm my findings on the right ear. If you concur about otitis media, then we should give him some antibiotics. Since he doesn't have any allergies to medications, I think amoxicillin is a reasonable choice."

Preceptor: "You did a good job of putting the history and physical exam findings together into a coherent whole. It does sound as if otitis media is the most likely problem. There is great variability in ear problems. The key features of otitis media that I look for in the physical exam are the appearance and mobility of the ear drum, landmarks, opacity of the drum, and mucus discharge, and in the history are prior upper respiratory infections and past problems with the ears. This child would seem to fit these criteria."

"With the lack of allergies, amoxicillin is a logical choice for an antibiotic. I'll be glad to confirm your ear exam findings. Let's go and see the patient."

The Case of an Adolescent Girl

In ambulatory clinic, a third year medical student presents the following case to you. The student appears to be conscientious but somewhat insecure about her knowledge and skill in pediatrics. The student reports:

Student: "I just finished examining a 16 year-old girl. She has been complaining of pain when she urinates for the past few days. She has never had a urinary tract infection. She denies burning on urination, abdominal pain, fever or seeing blood in her urine. She says she thinks her last menstrual period was a couple of weeks ago. I don't know if she is sexually active. I wasn't sure if I was supposed to ask those kinds of questions. She is here with her mother.

"On physical exam, she looked well to me. She was afebrile and the rest of her vital signs were O.K. Her HEENT exam was normal. Her lungs were clear and her heart was regular without any murmurs. Her abdomen was soft and not tender and I didn't think her spleen or liver were enlarged. That's all I examined."

(Preceptor as Expert Consultant: "Get a urine and make sure she doesn't have a vaginal or meatal discharge.")

<Stop>

Preceptor: "What do you think is her problem?"
(Skill 1: Get a Commitment)

Student: "I am concerned that it might be a urinary tract infection."

Preceptor: "What do you see here that might indicate a urinary tract infection?"
(Skill 2: Probe for Underlying Reasoning)

Student: "She has pain on urination but not much of a problem with frequency or urgency of urination."

Preceptor: "The UTI is a logical possibility but we don't have adequate information to confirm the diagnosis. We need a more complete physical examination -- particularly of the lower abdomen and external genitalia. We also need a sexual history. Has she suddenly become sexually active?"

"You identified the most probable concern in this case but you need to complete the physical exam and get a sexual history. Without more information, we can't be sure of what we have."

"Do you want me to model how to take a sexual history and do a pelvic examination or would you like me to observe you do them?"

(Skills 3-5: Teach General Rules, Provide Positive Feedback, and Correct Errors)

Student: "I would really appreciate your demonstrating how to do them."

Preceptor: "O.K. Let's go and see the patient."

Microskill Precepting Simulations

Working in triads or small groups, each person will have the opportunity to play the student, the preceptor and the observer of the interaction.

Roles

Learner: Use one of the trigger cases at the end of this workbook. Remember that **learners make mistakes** and modify your presentations accordingly! Don't offer your ideas too freely; or the preceptor will be left with nothing to do.

Preceptor: Use as many of the microskills as you can - try for at least the first two (getting a commitment and probing for evidence). Remember that these skills are counter-intuitive and may not be part of your regular teaching scripts. Thus, you will need to be purposefully aware of the microskills as you practice them.

Observer: Take brief notes on the dialogue, cues and responses. What microskills are being used? What suggestions can you make for improvement?

Process

Choose roles.

Role play for 3 to 5 minutes.

After completing the simulation, allow the "preceptor" to critique him/herself, then the student, then the observer.

Practice Cases

Directions: The following case presentations provide the stimulus for a teaching simulation. One person should perform the role of the resident, another the preceptor, and the remainder observers. Preceptors should practice using as many of the five microskills as possible.

1. Learner: I just don't understand these electrolytes on my patient, Mr. T. He's the 36 year old man on 4 East with alcoholic hepatitis. His sodium is 133, potassium 2.9, Chloride 102, and bicarbonate 18. He looks O.K., but still has some nausea and a fever of 101.2. BP is 106/68, pulse 90. On exam he is jaundiced, and has mild RUQ tenderness but no rebound. His wbc is 16.8, unchanged from admission. Why do you think his potassium is so low? We've been putting some in his IV fluid.

2. Learner: I have a 57 year old male with a history of hypertension, one pack per day smoker who presents with dyspnea when climbing hills to work. Further questioning reveals a vague tightening in the anterior chest with exertion that the patient rates as 6/10. He first noted this 2 months ago, now occurring daily. He had a pain free, comfortable exam. BP 140/90, EKG normal. I'm wondering if we should admit him to the hospital.

3. Learner: I have a case of an 18 year-old G1P0 single, white female who presented for her regular prenatal appointment at 31 3/7 weeks gestation (by a 13-week ultrasound). She incidentally complained of a frontal headache and swelling in her ankles and hands. Her blood pressure was 180/100. Urine was 4+ SSA. She has 3+ edema, 3+ deep tendon reflexes, and her cervix was thick and closed.

4. Learner: I have a 35 year old female with two teenagers who reports being depressed and having suicidal ideations. The patient quit work three months ago to help her husband in his business and to assist in the home remodel. She began worrying about money and has lost sleep, appetite and energy.

5. Learner: I have a five-year-old boy with fever and ear pain for five days. His tympanic membrane are red. I'd like to treat him with amoxicillin and Actifed.

References on Clinical Teaching

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What Do Emergency Medicine Learners Want from Their Teachers? A Multicenter Focus Group Analysis

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Abstract

Background: To the best of the authors' knowledge, there are no reports describing what learners believe are good emergency medicine (EM) teaching practices. EM faculty developers are compromised by this lack of knowledge about what EM learners appreciate in their teachers. **Objectives:** To determine what Canadian EM learners consider to be good prerequisites and strategies for effective teaching in the emergency department (ED). **Methods:** Clinical clerks and residents from the Canadian College of Family Physicians, Emergency Medicine certification [CCFP(EM)] fellowship program, the Royal College of Physicians and Surgeons of Canada, Emergency Medicine certification [FRCP(EM)] fellowship program, and off-service programs from all five Ontario medical schools participated in monitored focus-group sessions. Conversations were recorded, transcribed by a third party, and coded by two independent assessors using standard grounded theory methods. The text was categorized based on the final code into basic themes and specific qualifiers, which were

then sorted by frequency of mention in the focus groups. Results are presented in descriptive fashion. **Results:** Twenty-eight learners participated. They identified 14 major principles for good EM teaching, and a further 30 specific qualifiers. The top five principles were: "has a positive teacher attitude," "takes time to teach," "uses teachable moments well," "tailors teaching to the learner," and "gives appropriate feedback." Agreement on classification of ideas was 86%. **Conclusions:** Learners are sensitive to the constraints of the ED teaching environment, and have consistent views about good ED teaching practices. Among 14 general principles identified, "takes time to teach," "gives feedback," "tailors teaching to the learner," "uses teachable moments," and "has a good teacher attitude" were the most commonly reported. **Key words:** emergency medicine; medical education; clinical teaching; learner perceptions; postgraduate medicine; undergraduate medicine; emergency department. *ACADEMIC EMERGENCY MEDICINE* 2005; 12:856-861.

While emergency departments (EDs) provide a unique opportunity for clinical teaching, little original research on what learners consider to be good ED teaching practices exists.^{1,2} Studies in other areas consistently show that learners value a positive teacher attitude, enthusiasm, patient-centeredness, and good teaching skills.²⁻⁹ These traits and practices have informed the development of effective teaching models for ambulatory teaching settings.^{6,10-12} However, the ED setting presents challenges to traditional good teaching practices markedly dissimilar from

those found on the wards, in the operating rooms, or even in other ambulatory environments. For example, the frequency of interruptions during clinical activities is higher during ED shifts than elsewhere, ED teaching must occur around the clock, and it must address the needs of learners from a variety of programs, at different levels of training, and with a vast array of previous experience.¹³⁻¹⁶ The diversity of patient demographic characteristics and the spectrum of diseases seen make the ED a rich learning environment, but challenge teachers to maintain high-quality and consistent teaching. Schedules for trainees and staff physicians are often independent, taking away the opportunity for a staff physician to become comfortable over time with an individual learner's interests, capabilities, and needs. Finally, all ED teaching interactions must be balanced against the imperative to maintain tolerable patient waiting times, the interests of nonmedicine health care workers, and scheduling inconveniences.

Accomplished ED teachers can identify what they do to effect good learning during clinical shifts.¹⁷ Good teaching practices from the perspective of the ED learner have not been explored. With no reports describing what trainees feel are good prerequisites and practices for effective emergency medicine (EM)

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teaching, faculty developers are compromised in their efforts to improve or develop specific ED teaching skills and characteristics. The objective of our study was to determine what EM learners consider to be prerequisites and practices for effective EM teaching.

METHODS

Study Design. A qualitative methodology best suited the exploratory ethnographic nature of our question.¹⁸ We chose to conduct focus groups across medical schools, and concurrently include a variety of opinions from each important ED learner group to improve the generalizability of our results. Participants were assured that all comments would remain anonymous to anyone other than the moderator, and that specific comments would not be attributed to individuals in any publication of the data. Students were told that participation in the interview would be considered implied consent, and all demonstrated understanding of and agreement with this. This study received institutional ethics review board approval.

Study Setting and Population. The EM program chief residents at all five academic centers in Ontario were asked to solicit five volunteers for a focus group held at their institution. Each focus group was to include a medical student, a junior and senior FRCP (Fellowship, Royal College of Physicians and Surgeons of Canada) resident, a CCFP(EM) (Canadian College of Family Physicians, Emergency Medicine certification) resident, and an off-service resident. CCFP(EM) residents are third-year family practice residents completing a specialized year of EM training, and off-service residents are those whose primary specialty is not EM but who were doing an EM rotation at the time of the study. We were able to balance representation and achieve optimum focus-group size by limiting our groups to five or six members.¹⁹

Study Protocol. The same trained moderator conducted the focus groups at each site using standardized instigating questions. Discussions were tape-recorded and transcribed by a third party. Participants were assigned a code to be stated prior to each comment indicating their status (e.g., "junior") to allow matching of comments with participant level yet ensure confidentiality and encourage candid commentary.

Scripts were reviewed by two independent assessors (GB and LT) and a coding framework was derived using grounded theory methods.²⁰⁻²² The narrative text was broken up into individual ideas at the reviewers' discretion. Each idea was considered novel to the project if it was fundamentally different from anything previously mentioned. A repeat occurrence of an idea was noted if an idea was supported by another participant or mentioned by the original participant in a different context. Repeated mentions

of the same idea by the same participant during a single context or anecdote were counted only once. Every novel idea was assigned a new teaching code and, in the case of subtle variation, a new qualifier code. When a new code was added to the list, the entire transcript was reviewed to reclassify ideas as needed. The two reviewers' codes were then compared, interpretation difficulties were resolved, and the codes were combined by consensus agreement into a final code. The two reviewers independently coded five sample pages of transcript to determine assessor agreement. The reviewers agreed on 41 coded items and disagreed on nine. Five of these nine disagreements involved agreement on general theme but disagreement on specific qualifiers. One involved disagreement on a general theme, and the remaining three were text fragments identified as separate thoughts and coded by one reviewer but not the other.

The five transcripts from the focus groups were then recoded by a single investigator (LT) using the final code. Twenty percent of the data were also coded independently by a third investigator (SL), to allow estimation of interrater reliability, measured by agreement. Text fragments that were believed to adhere to more than one code label were included in as many code categories as applicable.

Data Analysis. The number of occurrences in the entire transcript for each general theme and specific qualifier was then determined. This number was used as an estimate of the popularity of the idea among participants. The code strategies and qualifiers were arranged in descending order of popularity and tabulated.

RESULTS

Characteristics of Focus Groups. Twenty-eight learners participated in the five focus groups between October 2002 and August 2003. The constituencies of the groups differed slightly because of local recruitment practices of senior residents, volunteer availability, and scheduling. Although not every focus group had a representative from each learner group, and several had double representatives, our overall representation was acceptable because we sought to provide broad representation of groups rather than to distinguish between them. Participants included 15 FRCP residents, five CCFP(EM) residents, four medical students, and four off-service residents. Focus groups lasted from 55 to 120 minutes (average 99 minutes).

Main Results. Participants provided 680 individual text fragments, or ideas, during the focus groups. Fourteen general principles for effective teaching emerged from the coded text. These categories are

TABLE 1. Effective Teaching in the ED

General Principle	Specific Characteristic	Occurrences in Interview
1. Takes time to teach	a. Uses flexible approach	52
2. Gives appropriate feedback		39
3. Tailors teaching to learner	a. Tailors to level	37
	b. Tailors to personal circumstances	20
4. Uses teachable moments well	a. Uses cases for teaching	35
	b. Finds a teachable moment	35
	c. Considers/uses broad range of content area	29
5. Positive teacher attitude	a. Attentive to learner	30
	b. Enthusiastic	28
	c. Approachable	24
	d. Communicates	21
	e. Proactive/takes initiative	21
	f. Honest	19
	g. Encouraging/supportive	18
	h. Open to questions	15
	i. Patient	7
	j. Flexible	7
	k. Sense of humor	2
6. Demonstrates useful ED skills	a. Knowledgeable	30
	b. Multitasks/good time management	17
	c. Organized	7
7. Treats resident as a colleague	a. Treats with respect	29
8. Challenges student	a. Asks questions	27
9. Provides independence	a. Gives autonomy	27
	b. Provides supervision	16
10. Sets expectations	a. Addresses knowledge base	16
	b. Addresses performance	14
	c. Addresses expectations of the teacher	13
11. Teaches skills effectively	a. Teaches procedures effectively	15
	b. Teaches history and physical examination	8
12. Uses formal teaching techniques or sessions	a. Assigns reading	15
13. Possesses formal training in teaching/education		4
14. Uses visual teaching aids/props/equipment		3

arranged in descending order of frequency (Table 1). The agreement on the 20% of independently coded material using the final merged code was high at 86%. The top 12 principles were mentioned at least 15 times each, and in all five focus groups. The last two principles, “formal training in education” and “uses visual teaching aids/props/equipment,” were mentioned in some but not all focus groups. General themes were broken down into an average of 2.75 more specific qualifiers (range 0–11).

Our data give rise to several interesting interpretations. The top five general principles of effective ED teaching in our study may relate to how they address an underlying fundamental challenge to ED teaching, that of efficiency. With constant competing demands, efficiency is essential to carrying out effective teaching in the ED. In the authors’ experience with EM faculty development needs assessments, clinical EM faculty members frequently ask for efficient strategies for teaching.²³ These top five principles were: “takes time to teach,” “gives appropriate feedback,” “tailors teaching to learner,” “uses the teachable moment,” and “has a good teacher attitude.” Combining these principles into a summary sentence, an effective ED teacher is one who “demonstrates a good attitude while finding time to tailor relevant, contextual teach-

ing to the learner and provide feedback during the shift.” These principles are highly complementary. Moreover, there is synergy among them that makes their use applicable and advantageous in the busy ED teaching environment. The identification of these by learners in our study may represent an appreciation of the fact that effective teachers often use these synergistic strategies together. Teachers who tailor teaching are more likely to choose an appropriately relevant teaching point, and thus improve efficiency and save time. They will spend less time teaching material to which the learner is not receptive. In addition, teachers who know their learners can theoretically provide more directed, succinct, and informative feedback. A good teacher attitude increases learner receptiveness and enhances the teacher–learner relationship.^{7,24–27} Therefore, although all five of these strategies are independent, they may well be practiced together by many faculty who are regarded as effective teachers. An observational study might best explore this further.

Our results also suggest that relative differences in teaching approach, rather than absolute differences, are important to learners. Our focus-group participants did not identify specific levels of supervision or directedness, instead referring to the good teacher’s

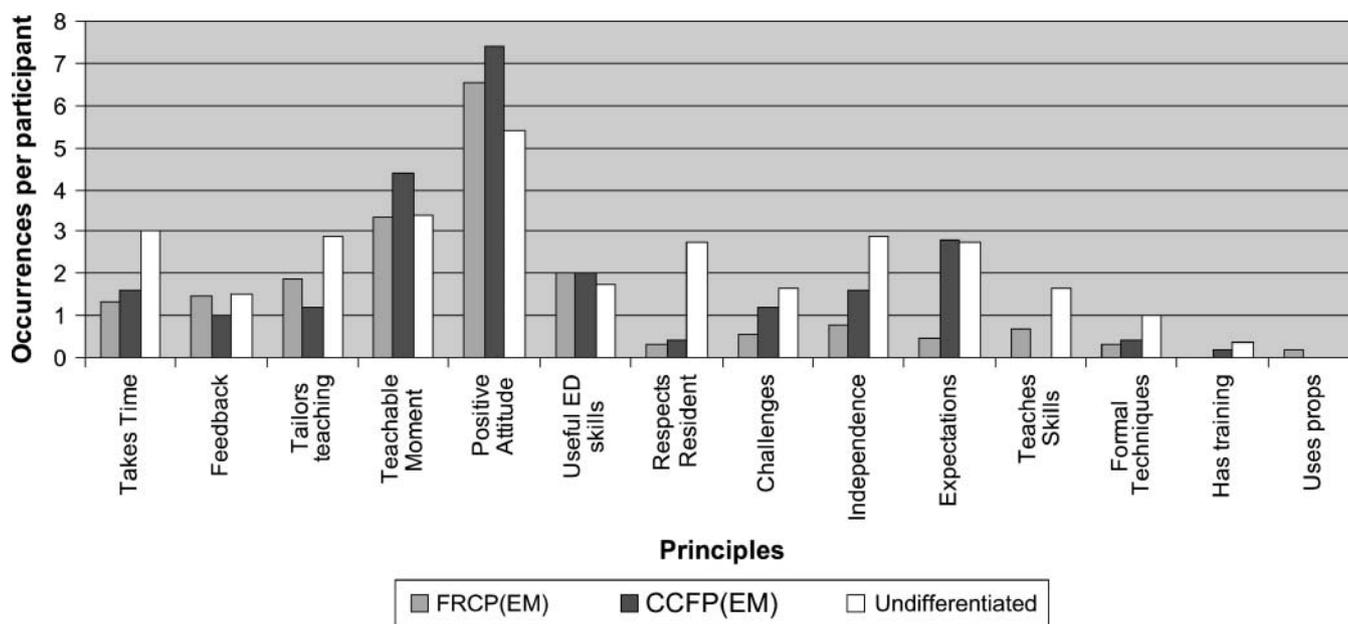


Figure 1. Proportion of participants mentioning each teaching principle. FRCP(EM) (Fellowship, Royal College of Physicians and Surgeons of Canada, Emergency Medicine certification) = 15; CCFP(EM) (Canadian College of Family Physicians, Emergency Medicine certification) = 5; undifferentiated = 8.

ability to match these to learner needs. This is important because previous work suggests that learners at different levels prefer different levels of involvement from their teachers and qualitatively different types of interaction.^{4,28} We have broken down the response rate by learner group (Figure 1). While we did not set out to discern differences between groups, it is reassuring to know that the distributions of answers across groups are similar. Notable exceptions include the undifferentiated learners' (medical students and off-service residents) endorsement of "treats learner as a colleague" and "takes time." Learners new to the ED (students) and those less familiar with it (off-service residents) may feel more vulnerable and uncertain in the environment. This may lead to more sensitivity to level of perceived respect. In addition, they may feel less empowered to approach faculty, and therefore appreciate it when faculty make time for them. In contrast, FRCP residents, who typically have significant ED experience and have repeated exposure to the same teachers over multiple rotations, mentioned "sets expectations" infrequently. This may represent their familiarity with the nuances of the rotation and diminished uncertainty about how their experience should be. Overall, however, the major themes are represented throughout all groups.

Our results reflect established principles of adult learning theory and support their applicability in the unique ED teaching environment. The 14 principles identified in our study are at a level of specificity that should make them easy to implement. However, 14 principles are too many for teachers to keep in mind at once. There is some benefit in grouping them under

general principles of education. When we attempted to do this, our confidence in the principles found in our study was reinforced by the ease with which they could be subsumed under basic principles of adult learning theory: learner-centeredness (takes the time, tailors teaching, treats resident as colleague, challenges student, sets expectations, provides independence); contextuality and relevance (uses teachable moments); effective teaching skills (teaches procedural skills effectively, possesses formal training in teaching, uses formal teaching techniques/sessions, uses visual aids/props/equipment, gives feedback); and good role modeling (has a good teacher attitude, possesses useful ED skills).^{2,29,30} The final principle is particularly important because research has demonstrated that good role models not only effect good learning, but also entice learners to consider the specialty as a career choice.^{5,8,9,31}

DISCUSSION

This study demonstrates several important learner perceptions about teaching in the ED. Emergency medicine residents, students, and off-service residents in Ontario schools identified 14 general principles and 30 specific characteristics as a basis for effective ED teaching. The principles were mentioned frequently across multiple sites and levels of learners, suggesting that participants perceived similar characteristics of teaching to be important in the ED. Half of the 30 specific characteristics stated in the interviews were mentioned more than 20 times in the text and 75% were mentioned more than 15 times.

Of the top five principles, feedback, tailored teaching, and good attitude have been identified by research in other areas.^{1,3,6,7,10,32-34} Learners preferred those teachers who were able to adapt these principles for use in the ED. The remaining two principles, "takes time" and "uses the teachable moment," may reflect sensitivities to the specific ED environment. Learners in general were sympathetic to the challenges faced by their ED teachers, and viewed favorably those who sought to overcome the challenges. Although not specifically a teaching technique, and therefore not part of our initial data analysis, we reviewed our transcripts and identified 22 comments indicative of learners' sympathy toward the teaching challenges faced by their teachers. For example, one off-service resident said, "Staff do not often have the time to sit down and go through maybe the salient parts of the case, but it's the good clinical teacher, I guess, who can sort of find the couple of important pearls."

A recent survey of experts in EM teaching identified 12 effective ED teaching strategies.¹⁷ The top five themes mentioned by students in our study were also among the teaching strategies most commonly mentioned by the expert teachers. The faculty were also able to provide examples of how they implemented the strategies in their daily teaching, thereby addressing challenges of the ED setting. All of the remaining principles identified in our study were also identified by faculty, either as one of the 12 general, or as one of the specific, effective teaching strategies. Moreover, the focus-group participants in our study were neither primed with lists of good teaching behaviors nor given any information about faculty perceptions. We conclude that faculty and learners generally agree on what makes a good ED teacher.

Of particular note are the two general principles mentioned least frequently in our study. Trainees mentioned "possesses formal training in teaching/education" and "uses visual teaching aids" four and three times, respectively, in the focus groups. Despite a long list of 30 specific characteristics listed as being prerequisites for effective ED teaching, the EM learners implied that ED faculty can demonstrate these qualities and techniques without having formal training in teaching. When formal training was mentioned, however, the students confirmed its importance, as indicated by the following quotes: "I think every physician in emergency medicine would benefit from doing a course or learning a bit extra on how to teach"; "The teachers who are outstanding have had some formal training"; "Faculty who are interested in being better teachers should develop the skill of teaching"; and "I think a teacher training module is important." Formal training was not something that many students thought to mention, suggesting that they are able to focus on what they prefer to encounter in their teachers rather than what background their

teachers have. Learners in our study may or may not have had any knowledge about what, if any, specific education training their teachers have had. We did not explore a real or perceived link between formal training and implementation of the teaching principles identified in this study.

Finally, all three references to using visual aids for teaching involved mention of practice oral examinations at the end of a shift. Excellent clinical teachers, however, mentioned using such items as electrocardiograms, radiographs, photographs, and Web-based material for self-guided learning, for quick question-and-answer sessions, or to embellish a case discussion.¹⁷

LIMITATIONS

Our study should be interpreted in light of several limitations. First, we included only learners from Ontario medical schools. Although unlikely, some findings may be specific to the teaching sites involved. Additionally, we recruited only five participants per site. Although this provided a small overall sample size, we are reassured by the consistency of responses across sites that the general principles derived represent a broad opinion among EM learners at sites similar to ours. The challenges of teaching in the ED are well established and have been identified in multiple centers.^{13-15,35,36} We interpret the general agreement of the principles outlined in our study with those reported from other areas of ambulatory teaching to mean that while the specific implementation will vary in EDs, the same general issues resonate with our learners. We included specific qualifiers for each principle to allow interested teachers to see how each principle might be implemented in an ED setting. We acknowledge that some of the specific qualifiers may not apply to all settings, and encourage teachers to reflect on how the more general principles may work for their particular circumstances.

Second, learners were not identified in the transcripts, but were known to their focus-group colleagues and the moderator. The moderator did not, however, have influence over the participants in their clinical encounters with teachers. This may still have limited their comfort in discussing teaching candidly. Mixing seniors and juniors may have had an adverse effect on what participants said. The seniors may have been reluctant to seem vulnerable and the juniors may have felt intimidated or unwilling to bring up concerns in the presence of their seniors, who may at some time be their teachers. Based on the number of suggestions generated, we believe that the learners were forthcoming with their perceptions of good teachers.

Third, we did not double-code all data. The agreement on the 20% of double-coded data was high, and suggests overall consistency in data interpretation.

Finally, our study was designed to determine trainee perceptions about teaching, rather than proven effective teaching practices.

CONCLUSIONS

Learners are sensitive to the constraints of the ED teaching environment and have consistent views about good ED teaching practices. Among 14 general principles identified, "takes time to teach," "gives feedback," "tailors teaching to the learner," "uses teachable moments," and "has a good teacher attitude" were the most commonly reported.

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Creating Effective Learning in Today's Emergency Departments: How Accomplished Teachers Get It Done

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Study objectives: Significant impediments to effective emergency department (ED) teaching compromise what could otherwise be an excellent learning milieu. There is little literature to guide faculty development around specific emergency medicine teaching techniques. We determine what recognized experts in emergency medicine teaching consider to be the important clinical teaching behaviors that make them good teachers, the main impediments to good teaching in EDs, and important prerequisites for a good ED teacher.

Methods: This was a structured telephone survey with qualitative grounded-theory analysis. Participants were current Canadian emergency medicine teaching faculty who have won awards, been promoted, or received persistent excellent evaluations according to their ED teaching. Participants underwent a 45- to 60-minute standardized structured telephone interview. Interviews were transcribed and independently coded by 2 investigators using a grounded-theory approach. The codes were merged by consensus, and the data were recoded. Twenty percent of data were then coded by both investigators to estimate interrater reliability of final coding. Discrepancies were resolved by agreement.

Results: Of 43 potential participants, 33 were still in practice, available, and willing to participate. Twelve ED-specific, practical, implementable strategies representing the general themes of learner-centeredness, active learning, individual relevance, and efficiency emerged. Participants collectively identified 6 significant impediments to teaching and 9 prerequisites to being an effective ED teacher.

Conclusion: Accomplished emergency medicine teaching faculty identify with common impediments to ED teaching yet are able to describe practical, easily implemented strategies that they believe make them good teachers. They also take advantage of basic prerequisites for good teaching. [Ann Emerg Med. 2005;45:253-261.]

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INTRODUCTION

Background

The emergency department (ED) should be an excellent learning environment, but it often is not. Perceived advantages include the wide variety of patient demographics, illness, and triage severity; the opportunity to treat undifferentiated patients from initial interview to disposition decision; and constant supervision by staff physicians. Perceived challenges include the unpredictable variability in workload, adapting to the diverse backgrounds of trainees, inconsistent longitudinal exposure to a given trainee, teaching around the clock, the imperative to maintain tolerable patient waiting times, and teaching in crowded and physically compromised departments. Little is

known about how some emergency physicians become accomplished teachers despite these limitations.

Importance

There is a paucity of research on ambulatory teaching techniques.¹⁻³ Most studies have looked at teacher qualities rather than specific behaviors.¹ Furthermore, there is no published original ED research on clinical teaching. Research-based faculty development on ED teaching must use teaching models adapted from other practice environments.⁴⁻¹⁰ It is unclear how implementable these models are in the ED. Despite limitations to effective ED teaching and notwithstanding the lack of research in the area, faculty development

Editor's Capsule Summary

What is already known on this topic

There is no consensus on the methods or styles that result in successful and effective clinical teaching in the emergency department (ED).

What question this study addressed

The authors wished to identify behaviors and strategies common to good clinical teachers in the ED.

What this study adds to our knowledge

By performing structured interviews of Canadian emergency medicine teaching faculty who had been prospectively identified as "exceptional clinical teachers," the authors identified 12 factors that the teachers believed accounted for their success and identified specific educational interventions. Six impediments to good teaching were also identified, with examples.

How this might change clinical practice

The study adds to our knowledge of the positive traits and interventions that appear to be associated with effective teaching and provides examples for clinicians who teach.

for those interested in improving their ED teaching must be provided.

Goals of This Investigation

We ascertain what accomplished clinical teachers in emergency medicine identify as teaching behaviors that make them good teachers, what they consider to be important impediments to good teaching in the ED, and what characteristics they regard as prerequisites for good teaching.

MATERIALS AND METHODS

Study Design, Setting, and Selection of Participants

This was a prospective qualitative structured interview survey using a modified Dillman methodology.¹¹ The setting was Canadian academic EDs supporting emergency medicine residency programs. Emergency medicine program directors at all 11 academic centers in Canada were asked to identify 5 faculty who had been distinguished for excellence in clinical teaching by 1 or more of the following means: teaching award winner, promotion in academic rank primarily on the basis of teaching, or sustained excellent evaluations for clinical teaching. Canadian programs are university based, meaning that the 5 excellent teachers at each center were in most cases chosen from a large faculty working at several hospital sites. Faculty not currently in emergency medicine teaching practice were excluded from participation.

Data Collection and Processing

Faculty were contacted by e-mail to request their participation. Nonrespondents were contacted by e-mail on 2 sub-

sequent occasions, and finally the program director was asked to approach individuals to request their participation. All interviews with faculty who were available, still in a teaching emergency medicine practice, and willing to participate were carried out and transcribed by a single investigator (GB) to ensure consistency. A standard introductory paragraph outlining the format of the interview was read to each participant, who then underwent a 45- to 60-minute standardized semistructured telephone interview. The interview template was designed by consensus of 2 investigators (RT, GB) and piloted on 3 local ED faculty to assess for understandability and practicality. The template received minor revisions on the basis of this process. Participants were informed of the data collection process, assured that individual responses would not be attributed to individuals, and told that the interview would not be recorded. Each participant was asked the same questions according to an interview template (Figure 1). Answers were explored in greater or lesser degrees for clarification and understanding at the discretion of the interviewer using predetermined specific qualifier questions. Responses were written down on a standardized form as direct quotes verbatim using abbreviations, short forms, and acronyms to expedite the process. Each question had a separate answer blank. The interviewer repeated each written response to the respondent for clarification and confirmation. Every response provided by the respondent was included in the final transcript for coding. The response forms were retained as a permanent record of the conversation. Responses were then directly transcribed immediately after each interview from the standardized form into a composite transcript for analysis. The final transcript was a list of independent ideas or thoughts provided by the interviewee grouped first by interviewee and then by category of questioning (strategies, impediments, prerequisites). Each element of the list was a distinct text fragment amenable to categorization.

Investigators agreed a priori on a coding format consisting of general categories and specific qualifiers. The final transcript was then reviewed independently by 2 investigators (GB, SL), who derived a code and categorized ideas in typical grounded-theory manner.¹²⁻¹⁴ Every novel idea was assigned a new strategy code, and in the case of subtle variation, a new qualifier code. When a new code was added to the list, the entire transcript was reviewed to reclassify ideas as needed. The 2 reviewers' codes were then compared and combined by consensus agreement into a final code. Each section of the transcript was then recoded by a single investigator (GB, SL) using the combined (final) code (Figure 2). Twenty percent of the data were also coded with the combined code independently by a second investigator (SL, GB) to allow estimation of interrater reliability.

Primary Data Analysis

The text fragments were rearranged into their coded categories according to the final code using standard word processing cut-and-paste functions (Microsoft Word, Office Professional 2000; Microsoft Corporation, Redmond, WA). Text fragments that were thought to adhere to more than 1 code

Strategy 1

General Question: What are 5 teaching strategies or techniques that you use during clinical shifts?

Specific Probe 1: Let's start with one. What do you do that makes you a good teacher?

Specific Probe 2: What would a typical teaching interaction be for you? How do you maximize that opportunity?

Specific Probe 3: What positive feedback have you had about your teaching?

Strategy 2

General Question: What other techniques do you use to facilitate learning?

Specific Probe 1: What would a typical teaching interaction be for you? How do you maximize that opportunity?

Specific Probe 2: What positive feedback have you had about your teaching?

Specific Probe 3: Do you have any "tricks" you use to facilitate learning?

Strategy 3

General Question: Can you think of a third technique you use?

Specific Probe 1: What would a typical teaching interaction be for you? How do you maximize that opportunity?

Specific Probe 2: What positive feedback have you had about your teaching?

Specific Probe 3: Do you have any "tricks" you use to facilitate learning?

Strategy 4

General Question: Are there any other techniques you have tried?

Specific Probe 1: What would a typical teaching interaction be for you? How do you maximize that opportunity?

Specific Probe 2: What positive feedback have you had about your teaching?

Specific Probe 3: Do you have any "tricks" you use to facilitate learning?

Strategy 5

General Question: Can you think of a fifth strategy?

Specific Probe 1: What would a typical teaching interaction be for you? How do you maximize that opportunity?

Specific Probe 2: What positive feedback have you had about your teaching?

Specific Probe 3: Do you have any "tricks" you use to facilitate learning?

PART 2: PREREQUISITES FOR GOOD TEACHING

General Question: What are the prerequisites for being a good teacher?

Specific Probe 1: Why do you think people find you a good teacher?

Specific Probe 2: Do you have any rules you try to use when you teach?

Specific Probe 3: What conditions, characteristics, or circumstances must be present before a teaching interaction begins for it to be successful?

PART 3: IMPEDIMENTS

General Question: What do you consider impediments to good clinical teaching?

Specific Probe 1: What would make teaching easier for you?

Specific Probe 2: What gets in the way of your teaching?

General Question: How do you cope with these constraints?

Specific Probe 1: You mentioned _____. You clearly have managed to be good teacher despite this. How do you do it?

General Question: How has the teaching environment changed during your career? (Choose one)

A lot worse, somewhat worse, the same, better, a lot better

General Question: What circumstances have led to this change?

Figure 1. Telephone interview template. (Specific probes were used if the general question failed to elicit an answer or if the interviewee requested further direction.)

label were included in as many code categories as applicable. Each general strategy and specific qualifier was then reviewed to determine the number of occurrences in the entire transcript. This was used as an estimate of the popularity of the idea among participants. Finally, the code strategies and qualifiers were arranged in descending order of popularity and tabulated.

Participants were assured that all comments would remain anonymous to everyone other than the interviewer and that specific comments would not be attributed to individuals in any publication of the data. Faculty were told that participation in the interview would be considered implied consent, and all faculty demonstrated understanding of and agreement with this. This project received institutional ethics review board approval.

RESULTS**Characteristics of Study Subjects**

A total of 46 potential participants were identified by program directors, of whom 43 were still in an emergency medicine teaching practice. Thirty-three participants responded to requests for interviews, and all 33 agreed to participate. The characteristics of the participants are listed in Table 1. The male:female ratio was 27:6, and the median length of time in practice was 10 years. All participants were certified in emergency medicine by either the Royal College of Physicians and Surgeons of Canada or the College of Family Physicians of Canada. No participants were identified only on the basis of academic promotion without also being an award winner or the recipient of sustained excellent teaching evaluations.

Main Results

The telephone interviews were conducted from October 2002 through April 2003. Every interview was completed with no missed questions. The median interview length was 56

1. Participant 1: bring extra cases, ECGs, radiographs, laboratory tests.
 - a. **8a** Keeps a file in his office
 - b. **9a** Can use as oral examination (short snappers) or as teaching point
 - c. **5a** Often will call over whoever is there, when busy limits it to 1 trainee
 - d. **3b** Can do this on about half of shifts
 - e. **3b** Particularly useful at night
2. Participant 6: **6a** Orient trainees to your practice
 - a. **6a** At the beginning of the first shift with you
 - b. **6a, 9b** My goals and objectives, your goals and objectives
 - c. **6b** What I want from you
 - d. **6a, 6b** Tell them to present pertinent positives and negatives, give time limits, what I expect from your level
3. Participant 26: **4a, 4b** Give as much responsibility to the students to make their own decisions as they can handle
 - a. **2b** See patient, formulate plan, then come and talk it over
 - b. **1a** Use for all levels
 - i. Amount of responsibility varies
 - ii. Supervision: treat all clinical clerk patients, PGY1-2 may hear about but not treat patient, PGY4-5 may not hear about all patients
4. Get them involved in interesting cases
 - a. **4a** Trauma: page them overhead
 - b. **4a** "Dr. so-and-so STAT to the trauma room"
 - c. **1a, 1d, 4b** Seniors run the codes
 - d. **4b, 1a** Juniors are given specific tasks
 - i. BVM, CPR
 - e. **1c** If they've done 1 or 2 codes, then you can get them to run the code with help and be more directive
 - i. That doesn't happen very often because of the number of codes and number of patients
5. **6c** Establish an educational contract
 - a. **6c** Each shift: even depends on the site
 - i. **6c** "What are we here for today?"
 - ii. **6b, 6c** "What are we going to accomplish?"
 - iii. **1d, 6c** Sometimes students say "I just want to see patients"
 1. "How would you like me to be involved today compared to yesterday?"
 2. "What part of the patient interaction do you want to focus on?"

Figure 2. Example of interview transcript coded with final code (bold combinations indicate code labels for each text fragment). *PGY*, Postgraduate year; *BVM*, bag-valve-mask; *CPR*, cardiopulmonary resuscitation.

minutes (range 38 to 75 minutes). The transcribed data totaled approximately 1,300 discrete text fragments. On the random 20% of text fragments double coded, the independent coders agreed on the classification for 92% of text fragments.

Table 1. Characteristics of participants in telephone interviews.

Characteristic	Participant Population (N=33)
Sex, No. (%)	
Male	27 (81.8)
Female	6 (18.2)
Qualification, No. (%)	
FRCP	21 (63.6)
CCFP(EM)	9 (27.3)
Both	3 (9.1)
Additional training, No. (%)	
Masters degree	6 (18.2)
Teaching courses	5 (15.2)
Subspecialty training	1 (3.0)
Years in practice	
Mean (\pm SD)	10.9 (\pm 7.13)
Median	10
Minimum	1.5
Maximum	25

FRCP, Fellow of the Royal College of Physicians; *CCFP(EM)*, Canadian College of Family Physicians, Emergency Medicine Certification.

Faculty were easily able to identify strategies that they used during clinical teaching. Twelve general strategies emerged from the coded text (Table 2). Each of our strategies is listed below in descending order of frequency, with some representative quotations from the interview transcripts in italics.

1. **Tailor teaching to the learner.** This was the most commonly cited strategy. Teachers believed that time spent getting to know and understand the learner made their teaching more efficient and effective: "I like to determine the needs when I first meet a learner, during the first few minutes of the first shift—find out their program, objectives, what they want to get out of the rotation. It shows you are interested in what they need as opposed to a cookie cutter approach and it takes about 2 minutes." Only by determining learner needs can faculty optimize the relevance of their teaching, which improves learner motivation: "Try and find out something about them. Improves rapport and lets them know you are interested in them as a person." The ideal teacher knows what skills to emphasize, how to challenge a given learner, and how to provide the most appropriate degree of supervision.
2. **Optimize teacher-learner interaction.** Excellent teachers use their knowledge of the individual to make teaching more directed and efficient: "I will discuss the main point of an x-ray and why it was missed, rather than go over the entire approach." They encourage the trainee to work through the problem: "Ask questions, get them to do the talking, let them try and work it through. Improves memory, promotes knowledge retention, exercises those connections. I do a lot of that." They teach at the bedside and bring evidence into the discussion when appropriate. Several teachers mentioned teaching scripts, a technique of using rehearsed focused teaching material directed at common needs of students in a given clinical scenario.¹⁵

Table 2. Categorization of strategies for good ED teaching.

General Principle	Specific Strategies	Occurrences in Text
1. Tailor teaching to learner	a. Know the learner	70
	b. Understand the learner	16
	c. Establish relevance and motivation	11
	d. Tailor amount of supervision	29
	e. Address specific desired skills	8
	f. Challenge the learner	19
2. Optimize faculty-learner interaction	a. Listen to learners	12
	b. Encourage problem solving	40
	c. Teach concise, important points	31
	d. Use teaching scripts	8
	e. Incorporate bedside teaching	7
	f. Be evidence based	4
3. Tailor teaching to the situation	a. Be flexible in your approach	29
	b. Recognize and respect time constraints	57
	c. Exploit ED strengths	8
4. Actively involve learner	a. Encourage autonomy	22
	b. Give responsibility and control	19
	c. Encourage self-insight	26
5. Actively seek opportunities to teach	a. Seek out or summon learners	22
	b. Seek out teaching points	22
	c. Select high-yield cases for teaching	14
6. Agree on expectations	a. Clearly explain what you expect the learner to do	22
	b. Clearly explain your expected level of performance	16
	c. Solicit meaningful learner objectives	18
7. Demonstrate a good teacher attitude	a. Maintain a facilitative approach	16
	b. Maintain a level of mutual respect	15
	c. Be approachable	6
	d. Use and demonstrate your own self-insight	16
8. Make use of additional learning resources	a. Hard copy	29
	b. Electronic	8
	c. Prepared cases	11
	d. Hands-on	4
9. Use teaching methods beyond the patient case	a. Practice examinations	9
	b. Homework	9
	c. Other	22
	d. Procedural skills	6
	e. Visual diagrams	5
10. Be a role model	a. Life-long learning	9
	b. Interactions	18
	c. Mentorship	3
11. Provide and encourage feedback	a. Provide feedback on performance	9
	b. Review cases and provide patient follow-up	10
	c. Solicit feedback on teaching	2
12. Improve the environment	a. Staffing	13
	b. Physical	5

- As methods for incorporating general principles into a busy shift, some faculty spread the principle out: “You gave me 2 causes of COPD [chronic obstructive pulmonary disease] deterioration; let’s see if you get 3 more during the shift.”
3. **Tailor teaching to the situation.** The ideal approach may change according to the circumstances: “Today it looks really busy; we will have to focus on brief, important points and discuss broad approaches another time.” Teaching time and intensity can be adjusted according to time of day, workload, and type of case. Optimizing teaching time when it is available will more than make up for decreased teaching at other times. Good teachers advocate avoiding excessive teaching when learners are least receptive, such as late hours on night shifts: “Avoid the ‘We MUST do some teaching’ problem—not always a good time.”
 4. **Actively involve the learner.** Participants try to put the learner in a position of responsibility and challenge them to make decisions: “If you don’t commit yourself, you’ll never be wrong, but you’ll never be right, either.” They then encourage the learners to think about how they approach problems and make decisions. “Telling them what to do all the time is not in their best interest.” “Ask what 3 things did you learn today? Stimulates recall and reinforcement of knowledge.” “Trauma case, resident reluctant; discuss approach outside the door, come up with plan. Do the primary survey, report back to me in 7 minutes, even if things are going well. Have disposition decision ready by 40 minutes.”
 5. **Actively seek opportunities to teach.** Our participants mentioned constant vigilance for teaching points in discussions and actively labelling them as such: “I have strategies for when it is busy and when it is quiet, but I still take 30 seconds to do a teachable moment.” They seek out learners to get them involved in an interesting case: “Be aware of them being there and calling them over when there is a sicker-than-your-average-bear patient.”
 6. **Agree on expectations.** Teachers describe developing learning objectives with students that detail what level of performance they expect from learners and what process tasks they expect learners to complete. “Seniors are told up front they’ll be expected to give plan, management, investigation, disposition plan, and estimate a timeline.” “Do this and they know what you’re looking for, else they are all over the map.” “How do you want to work today? Do you want to run the department? I’ll pick up the slack.”
 7. **Demonstrate a good teacher attitude.** Faculty thought that learners respond better to faculty who are approachable: “I’m a reasonably happy guy; we have fun.” “Demeanor is important. Some appear receptive to questions but what they are really saying is ‘don’t bug me; do it the way it seems I want you to.’” They thought that knowing one’s limits and being respectful were important.
 8. **Make use of additional teaching resources.** Common strategies include pen and paper, blackboards, Web-based teaching modules or resources, radiography files, folders of ECGs or laboratory values for interpretation, and prepared cases for oral examinations. “I do lots of diagrams. If you draw a picture of it, it makes a world of difference. The advantage of paper is that you can then give the trainee a copy. Use a duplicate form (like a consult note sheet) if there [is] more than one trainee.” Participants use these items before, during, or after shifts, depending on the time available.
 9. **Use teaching methods beyond patient care.** Faculty identified teaching methods such as mock oral examinations, providing a reference for the learner to review and summarize on the next encounter, procedure mockups, and role playing: “So I’m Mrs. Jones, now what are you going to tell me? Good for discharge instructions, bad news.”
 10. **Be a role model.** Faculty believed that good teachers should demonstrate the principles they are trying to teach, specifically in the areas of interpersonal interactions, maintenance of competence, and mentorship: “You are seen as a good teacher and physician if you connect well with patients.” Also, they actively demonstrate how they address their own limitations in knowledge: “I don’t know; let’s both look it up.”
 11. **Provide and encourage feedback.** Good teachers cite the fundamentals of feedback: timely, constructive, objective, impersonal, given in private, based on firsthand encounters, and a balance of positive and negative. “I don’t just tell them, ‘that’s not right’; we discuss why they want to do something and why I disagree or would do it differently.” They provide ongoing feedback to learners and solicit feedback on their own performance as teachers and clinicians. They do this during the shifts and in formal sessions after shifts: “Feedback: give it then and there, both good and bad. I feel bad that I haven’t given it earlier when they ask for it.”
 12. **Improve the environment.** Effective learning is a product of a good learning environment. Faculty in this study try to find a private place for teaching, optimize access to resources, and advocate for learner-friendly scheduling. “We have books close by.” “Tell the charge nurse not to bother me for a few minutes unless it’s really urgent.”
- In addition, interviewees also identified 8 prerequisites for effective teaching (Table 3) and 6 significant impediments to effective teaching in the ED (Table 4). Examples of how faculty addressed these are contained in Appendix E1 (available online at <http://www.mosby.com/AnnEmergMed>).

LIMITATIONS

There are several noteworthy limitations to our study. First, we did not double code all of our data. Independent coding by 2 coders produces less bias than the reliance on a single coder.¹⁴ Our final code was a merged code from 2 independent reviewers, with

Table 3. Categorization of prerequisites for good ED teaching.

General Principle	Specific Prerequisite	Occurrences in Text
1. Attitude	a. Approachable	7
	b. Mutual respect	12
	c. Facilitative	7
	d. Interest in learner	15
2. Environment	a. Staff	9
	b. Physical	17
	c. Scheduling	10
3. Enthusiasm and motivation	a. Intrinsic/intangible (eg, enjoyment)	13
	b. Extrinsic/tangible (eg, financial)	5
4. Receptive student	a. Interested	14
	b. Appropriate timing	2
5. Role model	a. Expert	4
	b. Teacher	4
	c. Clinician	7
6. Skills	a. Communication	4
	b. General teaching skills	7
7. Confidence	a. In clinical performance	6
	b. In teaching abilities	2
8. Knowledge base	a. Medical knowledge	7

a consensus resolution process for outstanding discrepancies. The high agreement of 92% on the 20% of the data that were double coded supports the reproducibility of our results. Second, our study did not attempt to determine effectiveness of specific teaching strategies. Rather, we relied on the opinions of previously recognized expert faculty as a surrogate measure of their behaviors. This limitation is inherent to survey research. A second study involving focus groups with emergency medicine trainees to compare their perceptions with those obtained in this study is nearing completion. Third, we elected not to record the interviews, and some may think this is a limitation. We believe otherwise for several reasons. Recorded interviews may lead to less candid responses and social expectation biases. Our method used verbatim note taking, frequent repetition, use of direct quotations, and concrete well-defined questions to maximize objective acquisition of data. We retained the original transcripts and notes for future reference if necessary. Tape-recorded interviews also need to be transcribed into codable text and therefore do not eliminate interviewer selection bias. Finally, the practice environments of specific faculty may not be similar to every teaching practice. The participants were heterogeneous from across Canada, but extrapolation of some specific strategies to other areas may not be valid. Given the large number of specific sites represented and the large number of specific strategies, we believe this would apply to a select few of the strategies.

Table 4. Categorization of impediments to good ED teaching.

General Principle	Specific Impediments	Occurrences
1. Competing demands	a. Patient care	10
	b. Professional interruptions	10
	c. Lack of understanding	5
2. Time		
a. Lack of time		24
3. Lack of resources	a. Lack of funding	4
	b. Lack of space	3
	c. Crowded clinical environment	5
4. Lack of interest	a. Lack of trainee interest	5
	b. Lack of faculty interest	4
5. Educational structure	a. Rapid trainee turnover	2
	b. Nature of emergency medicine practice	5
	c. Large number of faculty	1
6. Poor preparation	a. Lack of instruction about teaching	1
	b. Lack of feedback about teaching	1

DISCUSSION

This study reveals several important insights. Even accomplished ED teachers identify significant impediments to good ED teaching. These same faculty take advantage of prerequisites for good teaching and can describe specific strategies that they think help to improve their ED teaching. Although some of these concepts are similar to those derived from other studies in medical education, the following discussion focuses on those unique to the ED environment.

Prerequisites for good teaching relate to pervasive character and environmental traits rather than to specific behaviors. Our study (Table 3) confirmed the desirability of some prerequisites previously endorsed in nonambulatory teaching studies, such as positive attitude, enthusiasm, teaching skill set, and confidence.^{5,15-19} Faculty also listed some prerequisites specific to the ED. Environmental prerequisites included staff, physical plant, and scheduling. The ED is distinguished by the presence of a variety of health care professionals. Some may perceive teaching time as a diversion from patient care, thus creating potential conflict. Faculty in our study believed that a mutual understanding of the teaching mission by ED staff was important. Physical space requirements included enough room to treat patients in a respectful manner and a quiet, secluded place for focused teaching. Participants also thought that scheduling should facilitate continuity of teaching by devoting 1 or 2 faculty per rotation to each resident and that adherence to rigorous “shift hygiene” could optimize teacher and learner for the task at hand. Examples of how faculty use these prerequisites are provided in Appendix E1.

Some commonly mentioned impediments are specific to ED teaching. Frequent interruptions and competing demands were perceived as detrimental to effective teaching. Time-motion studies have demonstrated that emergency physicians frequently multitask and are interrupted an average of 10 times per hour, significantly more often than other ambulatory care specialists.^{20,21} During busy ED shifts, with patient waiting times often measured in hours, dedicated teaching time is hard to find and schedule predictably. Many faculty in our study seek out a “protected” space for teaching, ask that they be interrupted only for critical matters during teaching time, and make teaching a priority. Appendix E1 provides some examples of how faculty address these impediments.

Previous findings coincide well with our results on teaching strategies. Summaries of research in ambulatory teaching are available.^{1,4,7,22,23} In a thorough literature review published in 2000, Heidenreich et al¹ emphasized that most studies examine not what teachers do but their intrinsic characteristics and attitudes. Notably, none of the references cited were from emergency medicine. Despite the focus on teacher characteristics, they were able to derive a list of 11 teaching techniques based on educational theory and expert experience. Ten of these 11 teaching methods match closely some of the strategies from our work (Table 2): orienting the learner (strategies 6a, 6b), prioritizing or assessing the learner’s needs (6c), problem-oriented learning (2b, 5b, 5c), priming (6a, 6b), teaching in the patient’s presence (2e), 1 or 2 focal teaching points (2c), reflective modeling (7d), questioning (1f), feedback (11a), and teacher/learner reflection (11b, 11c). The 11th method, pattern recognition, is indirectly addressed in strategies 4c and 7d about self-insight: learners should be encouraged to recognize how their thinking affects decisionmaking. It is encouraging that common techniques derived from the literature seem to have a place in ED teaching.

The popular Five Microskills⁴ can exemplify how our strategies can be used to refine previous models for the ED context. “Get a commitment” is reflected in strategies 4b (give responsibility and control) and 6a, 6b, and 6c (explain what you expect the learner to do and the expected performance level, solicit meaningful learner objectives). “Probe for supporting evidence” closely approximates strategies 2b and 2f (encourage problem solving and evidence-based medicine). “Teach general rules” approximates strategies 2c and 2d (teach concise important points and use teaching scripts). “Reinforce what was done right,” and “Correct mistakes” resemble strategies 11a and 11b (provide feedback on performance, review cases, and provide follow-up). Other models can similarly be compared with our strategy list for assistance in adapting them to ED practice.

The top 5 teaching strategies derived in our study reflect 3 basic principles of adult education. Strategies 1 and 3 involve tailoring the approach to the learner (learner-centeredness) and to the circumstances in which one finds oneself practicing (contextual relevance). Strategies 2, 4, and 5 involve seeking teaching opportunities and encouraging the learner to be an active thinker in the learning process (active learning). Previous

reviews of ambulatory teaching have not promoted these areas with such a degree of emphasis. Learner-centeredness is particularly important in ED teaching because learners come from various programs, are at different levels of training, and have different lifetime experiences.^{8,24,25} They are often scheduled with many faculty members, making ongoing cultivation of learning relationships difficult. In addition, ED teachers must have strategies that work during day, evening, and night shifts. Having sound practices for getting to know the trainees will help to optimize the efficiency and effectiveness of trainees’ learning in this environment. These highlight again the need for the contingency plans relied on by many ED faculty.

Although strategies 7 (Demonstrate a good teacher attitude) and 10 (Be a role model) may be regarded by some to be prerequisite characteristics, participants made conscious efforts to use these strategies in practice. We think that it is important to emphasize how one’s underlying traits can be used to greatest effect during challenging teaching scenarios.

The main strength of this study is that it explores what a large cohort of recognized experts in ED teaching identifies as successful teaching behaviors. Many of the strategies parallel those developed in other arenas of ambulatory teaching, with some important exceptions. We anticipate that these findings will empower those who seek to improve their teaching and will form a valuable basis for faculty development initiatives around ED teaching, which thus far have been limited by a lack of specific research in this area.

In Retrospect

We learned several lessons from this study. Commercial coding software may have made the analysis more efficient. A significant number of faculty did not respond to e-mails, and a significant amount of time was consumed waiting for responses. Initial telephone contact may have expedited the review. We would forgo this method in the future.

In summary, accomplished emergency medicine teachers overcome significant impediments by using practical strategies and taking advantage of basic prerequisites for good teaching. Some strategies identified by expert emergency medicine teachers are novel approaches unique to ED teaching, whereas others are adapted from previously derived approaches in other ambulatory settings.

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