

# Effective Clinical Teaching by Residents in Emergency Medicine

John E. Houghland, MD  
Jeffrey Druck, MD

From the Denver Health Residency in Emergency Medicine, Denver Health Medical Center, Denver, CO (Houghland); and the University of Colorado—Denver School of Medicine, Division of Emergency Medicine, Aurora, CO (Druck).

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## INTRODUCTION

The pace, level of patient acuity, and time constraints of the emergency department (ED) can limit teaching interactions between senior residents and the medical students and junior residents they supervise. Personal interaction between residents and learners (medical students and junior residents) is often limited to a brief presentation and discussion of the patient, easily making teaching an afterthought. Thus, the ED can seem like a less than ideal venue for effective clinical teaching by emergency medicine residents. The scenario below represents a missed opportunity for teaching in the ED.

*Learner: So, my assessment is . . . Ms. Jones is a 38-year-old woman with 2 days of right-sided pleuritic chest pain, shortness of breath, hemoptysis, and left calf swelling. I'm mostly worried about a PE, possibly from a DVT in her left leg—especially because she's had a DVT in the past.*

*Resident: Uh, what was that? Right, PE. I already ordered labs, an EKG, and a chest x-ray before you saw her. Hey, how many of the Wells Criteria does she have?*

*Learner: Oh, what are the Wells Criteria?*

*Resident: (pause) Looks like we've got a new patient in Room 11. Good question, though; why don't you look it up tonight. Anyway, how about you finish Mr. Smith's discharge instructions and see Room 11?*

Emergency medicine residents have numerous opportunities for teaching during their training, including educating patients, families, emergency medical services providers, staff members, junior residents, and medical students. However, as the vignette above illustrates, there may be many missed opportunities, some caused by perceived barriers to effective clinical teaching. Regardless, residents are encouraged to teach by the Accreditation Council for Graduate Medical Education, which recognizes explicitly the role of residents as facilitators of medical education. In addition, all physicians are encouraged by the Hippocratic Oath to teach trainees in the medical fold.<sup>1,2</sup> This article highlights the personal qualities of effective clinical educators and discusses how to navigate the perceived barriers to effective clinical teaching, using a step-by-step model ideally suited to the unique circumstances of emergency medicine practice. Finally, this article provides advice for 3 challenging teaching scenarios the senior resident will encounter: the

struggling learner, the “difficult” learner, and the junior resident.

The challenge of teaching as a resident can seem daunting; fortunately, current literature suggests that the bulk of being an effective clinical educator lies in certain personal qualities and behaviors. A recent meta-analysis showed that more than two thirds of the reported characteristics of excellent clinical teachers could be grouped into 3 categories: fostering positive and supportive relationships with learners, communicating clearly, and being enthusiastic about medicine and teaching.<sup>3</sup> Recent surveys support these findings and highlight the importance of creating “safe” learning environments in which medical students are treated as equals and feel free to ask questions and engage their instructors.<sup>4-6</sup>

Although the importance of the above personal qualities and behaviors cannot be overstated, there remain many perceived barriers to effective teaching in emergency medicine. Extended discussions commonly occurring in off-service ward rounds are not feasible in the ED, and many common methods of instruction are not applicable in higher-acuity patient encounters. However, there are a number of pedagogic methods and principles that, when applied in the appropriate context of patient acuity, will allow for effective teaching by the resident.

The ADDIE system is a well-defined instructional design system, originally developed by the US military for project design and management and subsequently used in numerous other contexts such as education (eg, curriculum development), technology (eg, product design), and health care (eg, patient safety protocols).<sup>7-9</sup> The original ADDIE system consisted of 5 phases: analysis, design, development, implementation, and evaluation. This system outlines a process of identifying problem areas within a system, targeting them for improvement, and evaluating the effect of any interventions.<sup>7</sup> A teaching method based on such a model is naturally well suited for delivering the concise, targeted instruction required in the clinical practice of emergency medicine. Furthermore, it follows that such a teaching method based on the versatile ADDIE system would allow for and guide instruction across a broad spectrum of patient acuity.

Before applying such a teaching method to clinical instruction, special consideration should be given to patient acuity. First, patient safety and the oath to do no harm take

**Table.** A 4-step method to effective clinical teaching by residents in emergency medicine, using the patient acuity levels outlined in “The Model of the Clinical Practice of Emergency Medicine.”<sup>10</sup>

Step of Instructional Method	Description	Example
Assessing the learner	Evaluate the learner’s existing knowledge base	“What can you tell me about pulmonary embolism?”
Determining the instructional content	Determine gaps in learner understanding	“Let’s talk about D-dimer and its diagnostic value for this patient. Do you think it would be helpful for us?”
Determining the instructional method	Choose an appropriate method for delivering the information	Critical patient encounter: “Pay close attention to my intubation technique.” Emergent patient encounter: “What are your first steps in diagnosis and management?” Lower-acuity patient encounter: “Let’s do a literature search to find the best answer to this question.”
Determining the effectiveness of instruction	Assess the success of the educational intervention	“How would your management have been different if his D-dimer were negative?”

precedence over instructional benefit (ie, instruction takes place after critical elements of care). Second, when instruction is implemented, patient acuity can guide the method of instruction. Thus, implementation, guided by acuity, becomes an implicit component of the teaching method presented in this article. Therefore, what follows is a 4-step method for effective clinical teaching by residents in emergency medicine, based on the ADDIE system: (1) assessing the learner, (2) determining the instructional content, (3) determining the instructional method, and (4) determining the effectiveness of instruction (Table).<sup>7,8</sup> As a conceptual framework for patient acuity, this article uses the 3 levels of acuity (critical, emergent, and lower acuity) described in “The Model of the Clinical Practice of Emergency Medicine,” a core document that defines the specialty.<sup>10</sup> In the later presentation of 3 well-accepted teaching methods (didactic, Socratic, demonstrative), emphasis is made about their most appropriate use within these 3 levels of acuity.

## ASSESSING THE LEARNER

Begin by assessing the learner’s existing knowledge and skills and target the learner’s specific needs. There are a variety of ways to do this, and most areas to target can be identified by asking questions.<sup>11</sup>

Before the shift, the following question can help assess knowledge gaps, as well as increase the learner’s motivation for learning:<sup>12</sup>

*Do you have any specific learning goals for this shift or rotation that I can help you meet?*

Before an emergent or lower-acuity patient encounter, one can ask certain questions to assess the learner’s experience. In their survey of Dutch medical students, Stalmeier et al<sup>4</sup> found the following question to be a “safe” way to determine potential knowledge gaps and areas of competence on which to build:

*What rotations have you had thus far?*

The learner could also be “primed” with questions that help him or her be more effective and efficient in the patient

encounter and additionally reveal the learner’s knowledge base. Examples include the following:

*Have you had much experience with diabetic ketoacidosis? and What kinds of things are on the differential diagnosis of the patient with low back pain?*

After the patient encounter, begin with clear, brief, and open-ended questions that have more than one acceptable answer. This method establishes rapport with the learner before progression to more difficult questions;<sup>13</sup> for example, the following:

*What is your initial approach to the patient with chest pain?*

The resident can broadly appraise the learner’s knowledge level according to the answer given. The following example answers are both correct on some level, but the follow-up conversation should be appropriate for the obviously different levels of medical knowledge:

1. *Well, I ask where the pain is.*

2. *There are several life-threatening causes of chest pain that I consider in each patient with chest pain, most of which can be ruled out on history and physical: tension pneumothorax, tamponade, ACS, PE, aortic dissection, and pneumonia, to name a few.*

## DECIDING THE INSTRUCTIONAL CONTENT

An accurate assessment of the learner’s needs translates easily into what can be taught. Instructional content can be chosen from 5 general areas, including knowledge (eg, pathophysiology, diagnosis, treatment of a disease), communication (eg, how a patient is presented), procedural skills (eg, placement of a central line), attitudes (eg, patient advocacy as an emergency physician in relation to consultants), and behaviors (eg, efficient management of patients in the ED). Recognizing how easily a learner can experience “information overload,” choose one topic area and teach in detail as patient acuity allows.

Effective teaching combines the learner’s needs with pertinent information and instruction in an efficient

manner.<sup>14,15</sup> Adult learners prefer the use of principles, concepts, and information that can be actively applied soon after learning in a problem-solving context.<sup>12</sup> Patient-centered teaching contextualizes information, which enhances transfer of knowledge to new settings and is more powerful than abstract or decontextualized knowledge (eg, preclinical year lectures).<sup>4,16-18</sup> Patient-centered teaching also allows the learner to identify elements of the case that are relevant to diagnosis and treatment.<sup>19</sup> Finally, combining rational instructional content with the emotional content of the patient encounter may maximize learner retention. Indeed, many physicians can attest to the importance of learning important clinical principles from their own difficult or memorable cases.

## DECIDING THE INSTRUCTIONAL METHOD

The decision of whether and how to implement instruction should be guided by patient acuity. For example, in critical patient encounters, learners can observe resuscitations and perform helpful tasks. Instruction can follow critical elements of patient management. More “real-time” instructional methods can be applied in emergent patient encounters. Although intensive oversight is required to prevent delays in patient care, the time often exists in emergent encounters for the learner to assess the situation, develop a differential diagnosis, and provide an initial plan. Lower-acuity patient encounters allow for the greatest diversity of instructional methods; the learner can be given the latitude to develop a plan and oversee the results of tests and treatments. In such cases, use of evidence-based medicine and information analysis could also be incorporated. Below is an overview of 3 recommended instructional methods (didactic, Socratic, demonstrative), with recommendations on their most appropriate application according to acuity.

### Didactic

Although didactic instruction is a teacher-centered method and involves a passive learner, it has appropriate applications in clinical education. Perhaps the best use of didactic instruction is the act of explaining one’s thought processes about medical decisionmaking. In a recent survey of internal medicine resident physicians, the best predictor of favorable attending physician evaluations by residents was how frequently the attending physician made explicit his or her clinical reasoning.<sup>20</sup> This practice is invaluable after critical patient encounters, during which there may be no time to make one’s medical decisionmaking explicit.

Another example of didactic teaching in the ED might be “board rounds,” in which staff and residents gather during the change of shift to discuss interesting cases, solicit advice, and review group practices.<sup>21</sup> A prospective study showed that board rounds resulted in changes in clinical management in 6% of cases; significant changes in evaluation, treatment, or disposition in 12% of cases; and a change in diagnosis in 2% of cases.<sup>22</sup>

### The Socratic Method

Asking questions remains a central and important method of instruction.<sup>23-25</sup> The Socratic Method is best suited for teaching during lower-acuity patient encounters. Avoid the practice of *pimping*, in which the learner is asked serial questions that are essentially unanswerable, often for the sake of rapid-fire questioning alone.<sup>26</sup> Instead, lead the learner to the correct answer through serial questions. After answers to basic questions have been established, such as those that test fact recall, progress to more complex questions that require synthesis and application of knowledge.<sup>27</sup>

Beckman and Lee<sup>27</sup> suggest several best practices for asking questions: (1) craft the statement into a question when inclined to speak, (2) craft questions that require synthesis and application of information, (3) wait silently for several seconds after asking a question, and (4) study closely the learner’s response and body language to create the next question.

### Demonstrative

The emergency physician has a broad skill set, and demonstrating these skills is a frequent method of instruction in the ED. Teaching may be limited to purely demonstrating a procedure in critical patient encounters, when there is little margin for error. When there is more time available in emergent and lower-acuity encounters, avoid using the “see one, do one, teach one” approach, which may overestimate the learner’s knowledge and leave little room for evaluation and feedback. Instead, a 4-step method to teaching procedures is advocated by Peyton<sup>28</sup> of the Royal College of Surgeons:

1. Demonstration: The teacher performs the procedure without narration at normal speed.
2. Deconstruction: The teacher demonstrates individual steps with narration.
3. Comprehension: The teacher performs the procedure while the learner describes the steps.
4. Performance: The learner performs the procedure and narrates.

An approach for teaching more accomplished learners is to ask the learner to demonstrate his or her understanding of the procedure in a hands-on fashion. For example, observe the learner open the central venous catheter kit and demonstrate his or her understanding of how all of the components are assembled; this provides a detailed assessment of the learner’s proficiency with the procedure and permits the resident to quickly identify specific areas for correction and improvement.

Perhaps the best method of demonstrative teaching is simulation. Simulation offers high-fidelity exposure to diverse high-acuity clinical scenarios, creates time for immediate debriefing that is not present in the clinical setting, and enables learners to engage their own critical reasoning by managing high-acuity “patients” without the danger of causing harm. Early studies in simulation showed promising results in bedside examination and advanced cardiac life support skills.<sup>29,30</sup> A study of a pediatric emergency medicine simulation curriculum by Adler et al<sup>31</sup> showed mixed results, possibly because of

limited exposure since other authors have subsequently demonstrated a dose-response relationship between the intensity of instructional interventions and postsimulation testing.<sup>32,33</sup> This assertion is supported by the positive results of a more recent study by Ten Eyck et al,<sup>34</sup> in which students showed improved test scores after simulation and reported higher satisfaction with simulation than standard curriculum.

## DETERMINING THE EFFECTIVENESS OF INSTRUCTION

Finally, evaluate the effectiveness of instruction by using several types of questions. This is most easily done after critical encounters or between active phases of patient management in emergent and lower-acuity encounters.

1. Direct questioning. Ask the learner to recall basic facts: *Can you summarize for me the EKG criteria for an ST-elevation MI?*
2. Direct application. Ask the learner to apply information in the context of the patient: *Can you tell me some of the features of Ms. Jones's story that are concerning for acute coronary syndrome?*
3. Case-based hypothetical. Ask the learner to apply hypothetical information to the case to test his or her use of the principles taught: *If Ms. Jones had ST-elevations in inferior leads, how might our immediate therapy for her pain be potentially different?*

## SPECIAL TEACHING SCENARIOS

The final section of this article provides advice for 3 challenging teaching scenarios the senior resident will encounter: the struggling learner, the "difficult" learner, and the junior resident.

### The Struggling Learner

As any resident knows well, medical training can be stressful. Intervening in a situation in which an individual is clearly struggling can be perceived by the resident as very difficult or as a sensitive situation to avoid altogether. Specifically, Lake and Ryan<sup>35</sup> observed that individuals may be reluctant to intervene because they are embarrassed, lack the skills, fear it may expose their own inadequacies, do not like upsetting people, believe it will make matters worse, or believe that they have no time to deal with the situation. Nevertheless, the resident can play a meaningful role in helping the struggling learner.

First, identify the source of the problem. Most struggling learners are identified through direct observation or through critical incidents, and the underlying problems include insufficient knowledge, poor clinical judgment, inefficient use of time, poor communication, or unethical behavior.<sup>36</sup> Although the latter issue is most appropriately addressed by a member of faculty or administration, the remaining issues can be easily targeted as areas for improvement. Communicate the learner's deficiency in a positive, supporting, and constructive feedback

session that will result in an effective change. Lake and Ryan<sup>35</sup> recommend the "quiet chat" approach to feedback:

1. Set time aside (eg, after the conclusion of a shift).
2. Elicit what the learner believes he or she did well.
3. List what the learner did well.
4. Ask what the learner believes could be improved.
5. List any other things that could be improved and mutually determine an action plan to remedy these issues.

### The "Difficult" Learner

Residents may also encounter the "difficult" learner: the medical student or off-service intern who is uninterested in emergency medicine, has a poor work ethic, or who is unresponsive to encouragement or feedback. There are numerous potential underlying causes for this, including dislike of the pace or clinical environment of the ED, perceived lack of interesting clinical problems, or believed lack of relevance to career plans. Regardless, educators can always attempt to change these attitudes and perceptions with the following strategies:

1. Be enthusiastic about the patients the learner sees and about the potentially interesting issues in the patient encounter—particularly elements of the differential diagnosis that would be potentially life threatening, diagnostically challenging, etc.
2. Avoid complaining about any patient encounter that may be perceived as less interesting; discuss permutations of the patient presentation that would make the management different or more complex.
3. Use the "carrot and stick" method: Elicit from the learner what interests him or her most. Explain that there will be multiple tasks during the rotation and that interesting and educational aspects of each patient will be highlighted. Commit to offering opportunities for the procedures or types of patients who interest the learner most.

There is no question that the key component of adult education, relating the topic at hand to a relevant situation to the learner, is critical to successfully teaching "difficult" students.<sup>37</sup>

### The Junior Resident

Residents have a special and perhaps most difficult task in teaching junior emergency medicine residents, who have a more sophisticated knowledge base than medical students. Although junior residents initially aim to master the basic skills of patient care, senior residents have the opportunity to focus on more advanced components of education, especially evidence-based medicine. In lower-acuity patient encounters, senior residents should bring new literature and appropriate references to the discussion with the junior resident. Although challenging, this practice gives the resident an opportunity to improve his or her knowledge base and grow as an educator. In particular, senior emergency medicine residents should give special concern to modeling and teaching the Accreditation Council for Graduate Medical Education Core Competencies. These serve as a basis for resident education in all specialties and include patient care,



medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.<sup>38</sup> The Accreditation Council for Graduate Medical Education Core Competencies have recently been integrated into the model of the clinical practice of emergency medicine, with emphasis on aspects and behaviors of the core competencies and their application to emergency medicine.<sup>10,39,40</sup>

## CONCLUSION

Effective clinical teaching can seem to be a great challenge for emergency medicine residents. Nevertheless, learners in the ED are sensitive to the unique constraints of the clinical environment and overwhelmingly report clinical teachers' personal qualities, communication, and ability to create a positive and safe learning environment as being critical to effective clinical education.<sup>3,41</sup> In addition to underscoring these important personal qualities and behaviors, this article provides residents with a 4-step method to delivering effective clinical teaching across the spectrum of acuity encountered in emergency medicine and provides advice for particularly challenging teaching scenarios.

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*Address for reprints:* John E. Houghland, MD, Denver Health Residency in Emergency Medicine, 777 Bannock St, Denver, CO 80204. 303-436-7142, fax 303-436-7541; E-mail [john.houghland@dhha.org](mailto:john.houghland@dhha.org).

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