

Chapter 6

Teaching Clinical Skills

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Being a clinician-teacher is exciting and stimulating. Most clinician-teachers simply enjoy teaching and value contributing to the development of young professionals. Clinicians also find that teaching keeps their knowledge and skills up to date. Clinical teachers are asked to fulfill a variety of roles. These include:

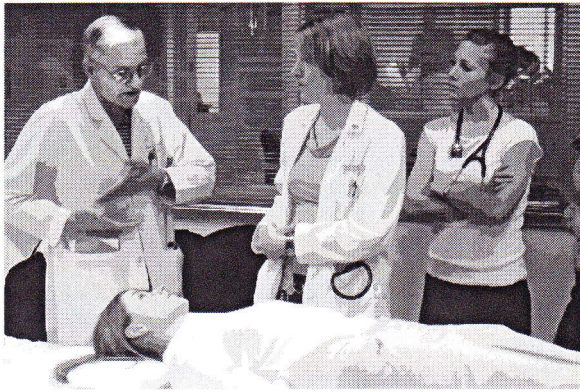
- Serving as a physician role model – exemplifying competent professional care of patients.
- Teaching and reinforcing clinical skills.
- Being a supervisor – providing opportunities for students to practice clinical skills with patients.
- Observing and providing feedback on student performance.
- Assisting students in linking basic sciences with clinical correlations.
- Mentoring students and facilitating their career development.

Learning teaching skills, including how to prepare for teaching and how to reflect on clinical experiences, will increase your satisfaction with teaching. Teaching in clinical settings is characterized by diversity. You may be asked to teach learners at different levels of training – from first-year medical students to resident physicians. You may also teach pharmacy students, nursing students or a multidisciplinary team of learners. I will use the word “student” throughout this chapter to refer to any of the learners you teach. Clinical teaching occurs in a variety of settings – in outpatient clinics, hospital wards, the emergency department, in the operating room, and during home visits. Any setting in which you care for patients is an opportunity for you to teach clinical skills. Although your teaching will be influenced by the kinds of patients you typically see and by the level of students you teach, the skills presented in this chapter can be used in any setting and with any of these learners.

In the following sections, we will explore each of the key phases of teaching in clinical settings: planning for teaching, teaching during the clinical encounter, and reflecting on the clinical experience.

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Planning for Teaching Clinical Skills

As you plan for clinical teaching, you need to understand the goals and objectives that the course or clerkship director has for the experience in which you are teaching. What are students expected to know or to be able to do as a result of your teaching? It will help you to know how the course or clerkship that you are teaching in relates to other courses and clinical experiences in the curriculum. Clinical experiences early in medical training allow students to correlate the basic sciences they are learning in the classroom with clinical problems. Later in training, students need patient care experiences to refine clinical skills and develop their fund of knowledge. You will want to plan learning activities that assist students in integrating content among courses, build on previous clinical experiences, and enhance the student's clinical capabilities.

When planning for clinical teaching, you need to consider the level of training of the student you will be working with and that student's interests and learning needs. Students early in their training are learning basic skills in interviewing and examining patients. They need opportunities both to observe you demonstrating these skills as well as opportunities to practice them with patients. Junior students are also socializing to the role of being a physician. You will want to explicitly role model professional behaviors. Students welcome mentoring that focuses on their development as novice clinicians. More advanced students are eager to refine their physical diagnosis skills. They are also developing clinical reasoning skills and capabilities in negotiating management plans with patients. Senior students are often exploring career options and are eager for your advice. Even within these generalizations, there are individual differences. You should plan to discuss goals and learning needs with each student.

Orienting Students to Facilitate Clinical Teaching

Orienting the student to your clinical setting is an important step in planning for clinical teaching. An orientation eases the student's transition to working with you

and your patients. During the orientation, be sure to explain your routines in patient care. Also introduce the student to anyone else you work with, for instance nursing staff, office staff or pharmacists.

Consider what the student might learn from each of these people. Medical assistants can teach students to measure blood pressure or blood glucose. Pharmacists can teach students about medication counseling. Students value diverse experiences in clinical settings and appreciate the importance of learning to work on a healthcare team.

During the orientation, describe to the student how you provide clinical supervision and teaching. This is a key step in establishing a positive learning climate. Students appreciate clinical teachers who are enthusiastic about teaching, who inspire confidence in students' knowledge and skills, who provide feedback, and who encourage students to accept responsibility for patient care. Being enthusiastic about teaching is demonstrated by asking students about themselves and their learning needs. Students welcome your efforts to provide them with clinical experiences that are relevant to their learning needs and their stage of development. Describe for the student how clinical encounters will occur. Should the student expect to "shadow" you for some encounters? How will you observe the student's clinical skills? What information do you want included in case presentations? What kinds of notes do you expect the student to write? What teaching methods do you plan to use? Will you give assignments to the student? When and how will the student's final evaluation take place?

Don't forget to find out what the student expects to learn by working with you. Some clinical teachers use "learning contracts" to negotiate goals and expectations with the student. These contracts can include self-assessments of clinical skills, a statement of the student's goals for the experience, and planned strategies for meeting those goals. While exploring the student's expectations, you can confirm that the student understands the goals and objectives for the experience, and that you understand the other courses and clinical experiences that the student has had. Discussing the student's career interests is also helpful (Table 6.1).

Table 6.1 Keys for an effective student orientation

Review the learning goals and expectations for the clinical experience.

- Orient the student to your clinical site, patient care routines, and staff.
 - Discuss your student's expectations for the experience.
 - Explain your expectations of the student.
 - Describe how you provide clinical supervision and teaching, including how feedback and evaluation will occur.
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Selecting Patients for Clinical Teaching

You need to plan for each of the student's clinical encounters. Although teachable moments occur with every patient, you want to have a clear purpose for each clinical encounter that the student has. What will the student learn by working with this patient? Patients who have typical presentations of common diseases or prototypical

clinical findings are good choices for students. Some clinical teachers select a general problem or theme for each session with a student. Students are able to observe a spectrum of patients with a similar diagnosis. Alternatively, by focusing on a clinical problem, students are able to compare and contrast different diagnoses with similar presentations. This assists students in developing concepts of the key features of diagnoses.

Plan to cover enough material with each patient encounter to stimulate the student's clinical thinking, but without overwhelming the student. Have one or two important teaching points for each encounter. The teaching points that you have selected should help the student meet the learning objectives for the clinical experience. Make sure that you have selected patients of manageable complexity for the student. At the beginning of each session, review the list of patients you are scheduled to see. Together you can select patients and discuss the teaching points that you have in mind.

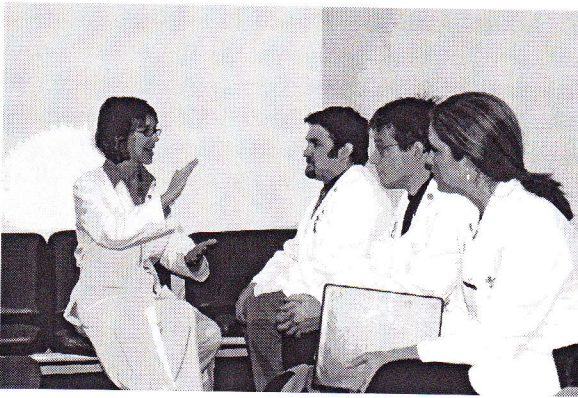
Select patients who have good communication skills and who are willing to work with students. Many patients appreciate the extra attention that students give them. Patients understand the importance of teaching students. They know that they are contributing to the development of the next generation of physicians. Be sure to brief each patient about the "teaching encounter." Introduce the student, explain how the encounter will occur, solicit the patient's consent, and inform the patient that you will return after the student has finished the encounter. Respect your patient's decision to not to work with your student. Many clinical teachers find that modeling the kind of relationship that they would like students to have with patients is beneficial. A useful rule of thumb is to treat your students as you would like them to treat your patients.

Teaching During the Clinical Encounter

As a clinical teacher you will be best served by having a variety of teaching methods to use in different situations and with different learners. What is most important is that you allow students to practice skills and work with problems that will help them gain clinical competence. Let the students practice what you want them to be able to do!

Using Questions and Feedback to Enhance Clinical Reasoning

Questions play a key role in any clinical teaching. Questions stimulate and engage students; help you to determine your student's knowledge level and learning needs; and help you monitor how your students are progressing. The questions you ask can promote higher-order thinking and encourage reflection. The questions you



have asked, and the student's responses, are also the basis for giving constructive feedback.

When discussing clinical cases, your questions can have three purposes – to obtain factual information, to explore the student's reasoning processes, or to explore the student's learning needs. A common problem with case discussions is that questions are limited to obtaining factual information. These lower-order questions ask for more information about the patient or about what the student knows. Students may also be asked to repeat or recall what they have learned. Lower-order questions may help the clinician to care for the patient, but these questions do not help students develop clinical judgment or problem-solving skills. In contrast, you can ask questions that explore the student's understanding of the patient's clinical problem – by asking the student to formulate the problem or to think through the problem. You can also probe the uncertainties or difficulties that the student is having; thereby eliciting the student's learning needs. Exploring clinical thinking and learning needs requires higher-order questions – questions that ask students to summarize, analyze, compare and contrast, and justify. Higher-order questions also tend to be open-ended, and thus have a range of possible responses (Table 6.2).

Table 6.2 Keys to asking effective questions

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- Ask one question at a time.
 - If you ask more than one question, you increase the complexity of the learning task.
 - Wait 3 s before and after the student answers.
 - Give students time to organize their thoughts.
 - Stay neutral until after the student has explained the answer.
 - Avoid the “rapid reward” that terminates thinking.
 - Use higher-order, open-ended questions.
 - Create a safe environment that permits students to answer incorrectly or to guess.
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The METRC Model for Case-Based Teaching

I will present two models of case-based teaching. The first is the “METRC” model, a variation of the “one-minute preceptor” or “microskills” model for teaching during clinical encounters. The steps of the “METRC” model are:

- Make a commitment.
- Explore or explain reasoning.
- Teach to the gaps.
- Reinforce what was done well.
- Correct mistakes.

After presenting a patient case to you, the student may pause or ask a question. This is your cue to ask the student to make a commitment to what she is thinking at this point. Your question allows the student to process information collected during the encounter. You are asking the student to formulate the clinical problem and to demonstrate her knowledge related to that clinical problem. Depending upon the specifics of the clinical case, your question might be “What do you think is going on with this patient?”, “What is the most likely diagnosis?”, “What tests would be most useful?”, or “What treatment plan would you propose?” You may be tempted to ask for more factual information about the patient, but wait.

Once the student has committed to a specific diagnosis (or diagnostic strategy or treatment plan), your next question is to ask the student to explain her answer. You might ask, “What information in the history and physical led you to that diagnosis?”, “What do you expect to find from the tests that you propose?”, “Why did you select that medication for treating the patient, given the options available?” These questions ask students to analyze information and to justify their decisions. Two questions that are helpful to probe the student’s thinking are to ask “What if the patient had . . .? How would that change your thinking?” and “How are . . . and . . . similar or different?” Questions that explore the student’s reasoning provide opportunities for the student to reveal additional information obtained from the patient that was omitted from the original case presentation. If you still have not heard important factual information, now is the time to ask.

After hearing the student responses to the first two steps, you know where the student’s gaps in knowledge or misconceptions are. The third step in the METRC model is to teach to the gaps. In general you should teach one or two important points – but not everything that you know about the patient or the diagnosis. Your teaching should match the learning needs of the student and should develop the student’s knowledge and skills. The first three steps in the METRC model may be used for a brief teaching encounter or may be repeated during a more in-depth case discussion. Your student may raise questions, which you may want to assign to the student for self-directed learning.

Each clinical encounter is an opportunity to give formative feedback to the student. The final two steps in the METRC model prompt you to do so. Begin by

reinforcing what the student did well. You should describe clearly the specific desirable behaviors you observed. Then correct any mistakes you observed or make suggestions for improvement. Again, you will need to be clear and specific. I will discuss feedback in more detail later in this chapter. The important point here is that you are able to give feedback based upon the student's knowledge and skills that you have probed through the questions that you have asked.

Teaching the Student to “Prime the Preceptor”

The second model for case-based teaching, SNAPPS, is an alternative to the METRC model. In this model, the student guides the clinical teaching encounter. In SNAPPS, the student primes the clinical teacher with what he needs to know or learn from the preceptor.

The student uses the following steps in clinical case presentations:

- Summarize briefly the patient's history and physical.
- Narrow the differential diagnosis to the two or three most relevant possibilities.
- Analyze the differential diagnosis by comparing and contrasting the diagnoses.
- Probe the clinical teacher by asking questions about areas of confusion, uncertainty or knowledge deficits.
- Plan management of the patient's medical issues.
- Select a focused, patient-related question for self-directed learning.

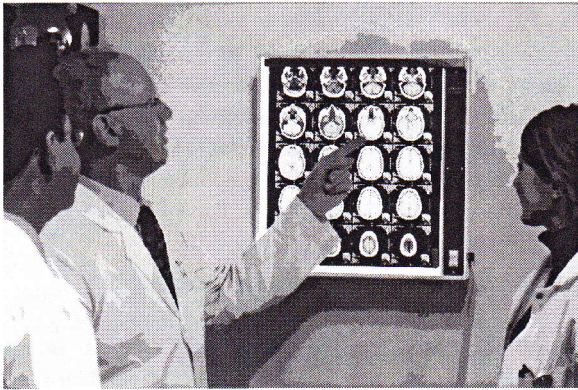
Students need to be taught this approach to case presentations. SNAPPS is a learner-centered model that focuses on both exploring the student's clinical reasoning and learning needs.

Teaching in the Patient's Presence

Teaching in the patient's presence involves a learning triad – the patient, the student, and you, the clinical teacher. Your task is to diagnose the patient's clinical problem along with the learner's abilities and needs. As discussed earlier in this chapter, it is important to prepare patients for their role in clinical teaching.

Maintaining good communication with patients during teaching encounters involves obtaining their consent, ensuring their understanding of the discussion, and allowing them to ask questions and give feedback to both you and the student. When discussing clinical information in the patient's presence, be sure to use language that the patient can understand.

As with any clinical teaching, you should have a focused purpose for teaching in the patient's presence. Using the technique of “priming” can help the student. Although priming can be used with any clinical encounter, it is especially helpful when you want to limit the time that the student spends with the patient. Simply, you identify the tasks that the student is expected to complete while with the patient and the time frame for completing the tasks. You will also want to explain what the



student will have accomplished as a result of the encounter, for instance a problem-focused note or an oral presentation.

Teaching Through “Active Observation”

Demonstration plays an important part in clinical teaching. In demonstrations, you ask the student to “Watch me take care of this patient.” Rather than simply having students passively observe your interactions with patients, use the technique of “active observation.” In this teaching method, begin by identifying what the student should learn from observing your interaction with a patient. You can use active observation with less experienced students to role model communication skills, clinical skills – including interviewing and physical examination, and professionalism. This method can also be used in complex or difficult situations, in which the student may not have the necessary knowledge or skills. Demonstrating communication skills in giving bad news to patients is an example. After identifying the learning objective, tell the student what she should do during the encounter – What should the student pay attention to? Be sure to prepare the student for whether you will ask questions or have the student repeat parts of the physical examination. After the clinical encounter, discuss what the student observed and learned from watching you.

As an example, you have a patient who is being prepared for hospital discharge. You would like your student to observe how you counsel your patient about the medications she is being discharged on. You ask your student to pay attention to how you ask your patient to repeat the instructions you have given to make sure that she understands. After asking for the student’s observations, you might continue the discussion with, “How else could we have confirmed that the patient understood the discharge instructions?”

The “Two-Minute Observation”

In addition to the opportunities for role modeling, teaching in the patient’s presence allows you to observe your student’s clinical skills. Students are rarely observed actually interacting with patients and families. Valuable opportunities for feedback are thus missed. Observations need not be detailed or time consuming. In fact it is probably better to make multiple short observations of your student. In the “two-minute observation” the clinical teacher observes the student interacting with the patient for 2 min. The teacher and student begin by establishing the objective for the observation. You may choose to focus on how the student begins the patient interview and whether the student uses open-ended questions to explore the patient’s concerns. Or you may focus on how the student counsels the patient on medications or lifestyle modification. No matter what your objective is, you will need to explain to the patient that you are observing the student and that you will return. You then make your observations and leave without disturbing the student-patient interaction. The student is now able to complete the patient visit. After the clinical encounter has concluded, give your student feedback on your observations.

Special Considerations for Teaching Physical Examination Skills

Students must perform four steps in order to make a correct diagnosis on the basis of the physical examination. Students need to anticipate the physical exam findings, perform the maneuvers necessary to elicit the findings, describe the findings that are present, and interpret the findings. In the first step, the student needs to anticipate what physical exam findings to look for based upon the patient’s clinical presentation. We know that exam findings are missed because students did not think to look for them. When teaching physical examination, ask students what key findings they would expect based on the two or three most likely diagnoses explaining the patient’s symptoms. The second step is to correctly perform the physical examination maneuvers that are needed to elicit the physical findings. Demonstration of correct techniques, followed by observation of the student’s performance, with feedback, are important teaching techniques. For complex skills, such as hearing heart murmurs, you may need to focus on only parts of the exam, for instance, “Listen in this area. Pay attention to what you hear between the first and second heart sounds.”

In the third step, the student must be able to describe the exam findings. Asking students to draw a picture of what they observed or to tap out a rhythm of what they heard can be helpful techniques to elicit their description of findings. You can help students learn the technical terms used to describe exam findings. Finally, the student interprets the exam findings in the context of the patient’s history. As a clinical teacher, you should emphasize each of these four steps through asking questions, demonstrating correct techniques, and providing feedback.

Special Considerations for Teaching Procedural Skills

You can use a four-step approach to teaching procedures. This approach can be used to teach relatively simple procedures such as peripheral intravenous catheter insertion, phlebotomy, or obtaining an electrocardiogram. These steps can also be used to teach other “procedures” such as physical examination skills. This approach allows students to learn both the cognitive and psychomotor steps in performing a procedure. Even with this approach, a student may not be able to completely master a procedure if there are not sufficient opportunities for practice and feedback.

Involving the patient in teaching procedures is crucial. You must explain the student’s role and your role in performing the procedure. It is your responsibility to obtain informed consent from the patient. You need to explain to the patient what is occurring while teaching or supervising the procedure.

In the first step, break down the procedure into its component parts. This includes more than the individual steps in correctly performing the procedure. It also includes the indications and contraindications for the procedure, as well as proper preparation and positioning of the patient, and use of the equipment. Demonstrate the procedure to the student in the second step. Perform your demonstration slowly – talking through each step. In the third step, you will perform the procedure, but the student will talk through each part of the procedure. These two steps allow the student to internalize the correct steps – without having to perform the motor skills necessary to complete the procedure.

The final step has the student actually perform the procedure, talking through each step that he is taking. This allows the student to add the motor skill component to the cognitive component. Depending upon the complexity of the procedure, it is clear that some procedures are best taught and learned on models or simulators. A clinical skills lab allows practice, repetition and feedback in a high-fidelity, low risk environment (see Chapter 7).

The “Final” Step in Clinical Teaching – Giving Constructive Feedback

Feedback is crucial to learning. Feedback allows students to learn about their current levels of competence and allows them to reflect on their strengths and weaknesses. Through feedback, students engage in a dialogue with a clinical teacher in order to become more competent. Feedback is the information that is given to the student that is intended to guide that student’s performance. Feedback should be given regularly. As suggested by the METRC model, there are opportunities for feedback in every teaching encounter.

Constructive feedback is timely, direct and clear. Don’t wait until too long after an event to give feedback. Your student will be more likely to accept your feedback and make changes, if you give feedback in a timely fashion. Be sensitive to the setting. Public areas are not conducive to well-received feedback – even if nothing

“negative” is said. Students are not always aware that you are giving feedback, so start by saying, “Let me give you some feedback.” Establish a positive tone. Asking your student how the rotation is going is a good way to decrease some of the student’s anxiety. Then ask the student to assess her performance by describing her perceptions of strengths and areas for improvement.

Feedback should deal with specific performances that you have observed. Too often we offer generalizations such as, “Good job!” Such feedback is uninformative. You should describe the specific behaviors that you observed and the consequences of those behaviors. Be constructive – focus on what the student can do differently in a similar situation. Feedback should be based upon the goals and expectations for the clinical experience that you established during your orientation with the student.

Feedback is not evaluation. Evaluation is the summative process that occurs at the end of a course, rotation or clerkship. Even though you included feedback in every teaching encounter, you should also plan for a mid-rotation feedback session to review the student’s overall performance. You may find it helpful to use the end-of-rotation evaluation form during this session. Plan to discuss to what extent the student is meeting the objectives of the experience, what competencies the student has demonstrated, and which skills need more work. Students are typically concerned about the final evaluation or grade. In these sessions, you can discuss how the student is progressing and set goals for the remainder of the rotation (Table 6.3).

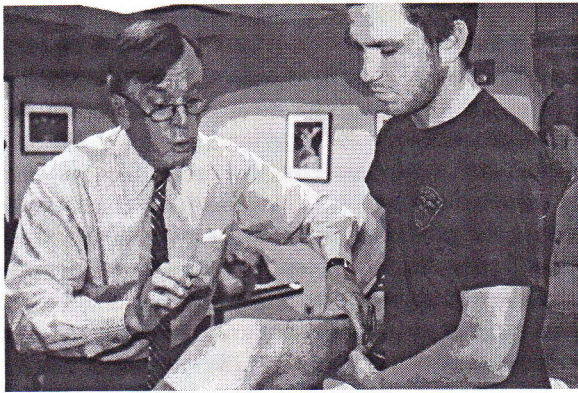
Table 6.3 Keys to giving constructive feedback

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- Make sure that feedback is well-timed and expected.
 - Ask for the student’s assessment of her performance.
 - Deal with specific behaviors that you have observed.
 - Don’t give too much feedback at one time. Instead, give feedback regularly.
 - Offer specific suggestions for improvement. Limit feedback to remediable behaviors.
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The Third Phase of Clinical Teaching – Reflecting on Clinical Experiences

Reflection is important in the learning process. Reflection on clinical experiences allows students to formulate and refine clinical concepts. The process of reflection creates additional opportunities for constructive feedback. Through reflection, students plan for and anticipate what they will do in future clinical encounters. Thus reflection prepares students for future learning.

Two specific strategies for reflection include “wrap-up rounds” and homework. During wrap-up rounds, the clinical teacher and student review the patients seen during the session. Ask the student to summarize the two or three most important points from the session. A useful question to ask is, “What did you learn today that was new for you?” Other tasks that require the student to synthesize knowledge are making charts or diagrams that explain what the student understands about the



pathophysiology of the patient's clinical problem or outline the student's approach to evaluating that problem. Ask your student how he would explain the concepts learned during the session to his peers. It is also useful to ask the student to make connections between clinical experiences and classroom learning. Ask, "What are you learning in your classes that related to patients you saw today?"

Giving homework assignments is another useful reflection exercise. Reading assignments encourage self-directed, independent learning. Have your students write down the questions that they have about patients in a small notebook or on file cards. Encourage them to make the question as specific as possible. The student should select one question that she decides is most important to taking care of the patient, or most intriguing, to read about after each session. You may need to provide the student some guidance on where to look for the answer. Have the student prepare a brief summary of what was learned from the reading assignment. Don't forget to review the homework assignments with your student. Occasionally students need guidance from the clinical preceptor about choosing an appropriate question. For more advanced students, homework assignments become opportunities to build skills in evidence-based medicine.

Summary

In this chapter, you have been introduced to teaching skills related to each of the key phases of teaching in clinical settings: planning for teaching, teaching during the clinical encounter, and reflecting on the clinical experience. Discuss the goals and expectations of the rotation – and the objective of each clinical encounter – with your student. Use effective questioning skills to promote your student's clinical judgment and problem solving skills. Explicitly demonstrate communication skills, clinical skills, and professional behaviors. Make frequent observations of your student's performance in each of these areas. Give regular constructive feedback. Spend time with your student reflecting on his clinical experiences. Enjoy the satisfaction of teaching students and contributing to their professional development.

For Further Reading

Alguire PC, Dewitt DE, Pinsky LE, Ferenchick GS (2001) Teaching in your office: A guide to instructing medical students and residents. American College of Physicians Philadelphia, Philadelphia, PA.

Although written for clinicians who teach in outpatient settings, the authors offer teaching recommendations that can be adapted to any patient care setting. The “quick tips” and “tools” for preceptors are especially helpful.

Bowen JL (2006) Educational strategies to promote clinical diagnostic reasoning. *New England Journal of Medicine* 355: 2217–2225.

A concise review of research in the clinical diagnostic reasoning process and recommendations for clinical teachers.

Neher JO, Gordon KC, Meyer B, Stevens N (1992) A five-step “microskills” model of clinical teaching. *Journal of the American Board of Family Practice* 5: 419–424

This paper describes the “one-minute preceptor” or METRC model of clinical precepting.

Sachdeva AK (1996) Use of effective feedback to facilitate adult learning. *Journal of Cancer Education* 11: 106–118

A comprehensive review of principles and strategies for giving effective feedback.

Wolpaw TM, Wolpaw DR, Papp KK (2003) SNAPPS: A learner-centered model for outpatient education. *Academic Medicine* 78: 893–898

Description of a learner-centered model for case presentation that condenses the reporting of facts and encourages expression of student’s thinking and reasoning.

Yudkowsky R, Otaki J, Lowenstein T, Riddle J, Nishigori H, Bordage G (2009) A hypothesis-driven physical examination learning and assessment procedure for medical students: initial validity evidence. *Medical Education*. 43: 729–740.

This model for teaching physical examination skills emphasizes the importance of anticipating physical findings in the context of a differential diagnosis.