The LACE Experience

Strategies for Working with Medical Students in a Clinical Setting

Jeff Swain PhD, Faculty Development Program Director and Menbere Dejenie, Education Research Analyst * University of California Riverside School of Medicine *
Faculty Development, Winter-Spring 2016
The LACE Experience

Strategies for Working with Medical Students in a Clinical Setting

About LACE
The Longitudinal Ambulatory Care Experience (LACE) program is a required and graded component of the UC Riverside, School of Medicine medical curriculum. LACE is a 3-year ambulatory clinical experience emphasizing core clinical attributes. LACE acts as a bridge between pre-clinical and clinical training content and also establishes a sustained mentor-mentee relationship with community-based primary care providers.

During LACE, clinical teachers are expected to introduce, practice, and refine core clinical primary care skills and attributes. These include preventive care and chronic disease management to medical students in years one, two, and three. These skills and attributes include history taking, physical examination, patient interaction, and professionalism skills. Here we will discuss strategies for teaching medical students how to take a patient history and perform a physical examination.

Principles of Adult Learning Theory
Unless you are preceptoring Doogie Howser, the chances are those who are placed in your charge are in fact adults. Therefore, in order to be effective as a preceptor, a resident needs to understand how adults learn.

Adult Learning Theory (Knowles, 1984) proposes adults learn best when learning focuses on the process of knowledge or skill acquisition rather than on the content as it stands by itself at the end. This theory comes from work performed in the field of cognitive psychology where research indicates factual and conceptual knowledge (the lower order thinking skills in the learning hierarchy) are best recalled and put into service when they

Teaching Principles
Make the students active members of the team.
Be certain that tasks assigned to students have learning value.
Be patient with students; have proper expectations of their medical knowledge.
Encourage questions.
Explain the rationale behind every test, consult, or lab ordered.
Feedback should be constructive, appropriate, timely, and include observations about interactions with patients, families, and other members of the health care team.
Feedback should be given frequently.
Be sure to close the loop on outstanding issues or assignments.
are taught, practiced, and assessed in the context in which they will be used. According to Knowles adult learners:

- Are self-directed and expect to take responsibility for their learning.
- Need to know why they need to learn something.
- Learn best through experience.
- Approach learning as a problem solving activity.
- Learn best when the topic is of immediate value.

Research findings strongly suggest medical students learn the art of being a physician by participating in patient care within an educational practice (Melvin, et al). Thus because of the primacy of their working relationship, the preceptor plays a critical role in the development of new physicians.

Active Learning
Following the tenants of adult learning theory, a preceptor should devise learning scenarios that require the student to be an active participant in his or her learning process. Standing opposed to more passive learning activities, such as a lecture or a presentation where the student is expected to do nothing more than sit back and listen, active learning scenarios require students to engage their higher-order thinking skills—identified as analysis, synthesis, and evaluation in Bloom’s taxonomy (1965)—through the process known as engagement.

According to Bonwell and Eison (1991), who coined the term active learning, there are two unbreakable commandments that must be adhered to if learning is to be considered active in nature. First, a student must engage in a problem solving activity of some kind, and (second) he or she must reflect on what transpired in some way afterward. For the preceptor this means coming up with teaching scenarios that can be thought of as a three act play where the student is required to do something to prepare for the learning event beforehand, then there is the actual event in which the student is an active participant, and, finally, the student must do some sort of follow-up work afterward to complete the active learning cycle.


- **Intentional engagement:** Where a student performs the identified skills to be learned. These performances may be set in real or simulated contexts: e.g., a student takes a medical history; performs a physical exam; and communicates the bad news of a particular condition to a patient.
- **Purposeful observation:** Where the student watches the preceptor demonstrate a new skill to be learned. These observations can be real or simulated, e.g., the student observes a cardiology
procedure; then observes the preceptor modeling the thought processes applied to understanding symptoms; then observes the interaction between the preceptor and patient where the patient speaks a different language from the preceptor.

- Critical reflection: Reflection is defined as thinking about how meaning is made. People make meaning based on their experiences and on the information and ideas they encounter (Fink). Much of meaning-making remains unconscious if it is not reflected upon. In this step, the preceptor debriefs the problem-solving activity with the student by summarizing key points, asking and answering questions, and assigning follow-up work.

Intentional engagement or purposeful observation, done without the reflective component, is just experience, and it is not clear that experience by itself does little more than confirm previously held prejudices (MacLellan). The teaching strategies outlined below take advantage of what we know about how adults learn and how to use active learning techniques. Each of these strategies utilizes the three act play metaphor format—labeled here as before, during, and after, and incorporates the active learning components engagement, observation, and reflection to some degree. A preceptor can use these strategies to optimize student learning in the ambulatory clinic or hospital setting.

Teaching Strategies
Designing active learning scenarios requires the preceptor to decide what role he/she will play and what role the student will play before, during, and after the exercise. What follows is a list of teaching strategies a preceptor can use when teaching medical students in a clinical setting. They are Modeling*, Case Presentation, both traditional and the One-Minute Preceptor*, Case-Based Teaching*, Coaching*, Assigning Directed Readings, and Self-Directed Learning. These strategies are designed to maximize the student experience and help the preceptor manage his/her time. Regardless of the teaching strategy employed, a preceptor should select cases or procedures that meet the student’s skill level at its edge and push the student to stretch his/her ability. Make it too easy and the student will learn nothing new; too difficult and the student will become lost and fail to pick up all the critical knowledge and skills necessary.

General Guidelines to Consider While Preceptoring

Prepare for the visit:
Orientate the student—number of patients to be seen, time to be spent with each patient and how to succinctly present.

Teach during the visit:
Ask questions to diagnose the learner’s knowledge and clinical reasoning, select a specific teaching point in each case, model good physician-patient interactions, observe at least in part learner-patient interactions and provide timely and specific feedback.

Teach after the visit:
Answer questions that arise from specific patient problems, clarify what learners did not understand, refer to literature and create reading assignments.

McGee & Irby 2003
Modeling
A critical means by which a preceptor influences the development of medical students is through modeling the core competencies required of a physician—clinical skills, critical thinking, and professional behavior—during interactions with patients and professional colleagues (Rencic). Modeled behavior provides the student with a template he or she can both follow and measure his or her own progress against.

Modeling is best used once the learner has gained foundational knowledge and skills required of the case or procedure. However, the scenario should involve the resolution of a patient problem with which the student is not that familiar. Modeling is done with a real patient and in real time. A preceptor can think of modeling as a way of providing “conceptual scaffolding” for the student to use to solve problems; that is, it helps to convey the process of building a solution to a complex problem (Schupbach).

For the preceptor, modeling requires the articulation of internal thought processes so the student can follow your diagnostic thought process. When modeling a preceptor should do his or her thinking out loud, share clinical hunches, and provide the student with a rationale for the decisions made and actions taken. Through modeling a preceptor illustrates the process of solving a complex problem in the actual practice environment (Wetzel, Walters, Taylor).

When using modeling as a teaching strategy the preceptor should: (Wetzel, Walters, Taylor):

- Tell the student in advance about the specific behavior to be modeled.
- Be prepared to demonstrate the modeled behavior or thought process in an exemplary manner and be able to explain it fully to the student.
- After the patient encounter is completed, modeling should include a brief discussion between the preceptor and student about what was accomplished and why it matters.

Case Presentation
Case presentation is where a student examines a patient independently and then presents his or her findings and treatment recommendations to the preceptor. Case presentation allows the student to obtain crucial experience interacting with patients; they learn how to generate reasonable assumptions about the patient’s complaint, and to develop a plan of action for treatment. The preceptor uses the case presentation as an opportunity to evaluate the development of the student’s critical thinking skills (Schupbach). Two popular methods of case presentation are the traditional method and the One-Minute Preceptor.
Traditional Case Presentation
The traditional case presentation frequently takes place after a student has interacted with a patient to collect a chief complaint and history. The student then presents the preceptor with his or her pertinent findings, his or her assessment of the etiology of the problem, and, perhaps, to propose a plan of action. The preceptor questions the student to probe for additional details about the case. The preceptor may also ask the student to justify their approach and findings. Finally, the preceptor will evaluate the patient for his/herself and advise the student on the best plan of treatment. Using the traditional case presentation model, a preceptor can help the student develop clinical reasoning skills by allowing him or her to verbalize his or her reasoning process (Wetzel, Walters, Taylor).

One-Minute Preceptor

The traditional case presentation has some limitations when used in an ambulatory setting. The traditional case presentation strategy can be time consuming and time is a valuable commodity for a busy practice. It also does not provide the preceptor a means in which to structure the preceptor-student interaction in a manner that maximizes the learning experience. Studies have indicated that on average, these interactions take approximately 10 minutes and the time is divided into several different activities. Much of the time is taken up by the presentation of the patient by the learner. Additional time is spent in questioning and clarifying the content of the presentation. As a result only about one minute of time is actually spent in discussion and teaching (monograph, Ohio University Heritage College of Osteopathic Medicine). Enter the One-Minute Preceptor.

Developed in 1992 by Neher, et al to address the shortcomings of the traditional way of presenting a case, the One-Minute Preceptor provides a framework for teaching in an ambulatory setting. The
strength of the One-Minute Preceptor framework is that it focuses the preceptor-student interaction on the decision-making process used by the student when examining the patient.

The One-Minute Preceptor consists of five tasks, called microskills, the preceptor cycles through when discussing a clinical case that the learner has just presented. The microskills are (1) get a commitment, (2) probe for supporting evidence, (3) reinforce what was done right (4) correct mistakes, and (5) teach general rules (Neher and Stevens). Beginning with asking the student his or her impression of the encounter (microskills 1 and 2) fosters student ownership of the case. The preceptor uses the student’s answers to reinforce correct performance (microskill 3) and identify knowledge gaps (microskill 4). This allows the preceptor to tailor the teaching moment to the needs of the student (microskill 5).

The microskills that make up the one-minute preceptor enable teachers to effectively assess, instruct, and give feedback more efficiently. (Gordon, Meyer, Irby, Greer). The One-Minute Preceptor approach allows the preceptor to maximize the time available for teaching. The teaching encounter will still take longer than a minute, on average between three and five, but the time spent is more efficiently used and the teaching effectiveness is optimized.

**Case-Based Teaching**

Case-based teaching (CBT) is an active learning strategy where a student engages in a deep review of a complex case with the preceptor. Working through the case—based on a real live experience of the preceptor—helps the student develop his or her analytical thinking and reflective judgment skills. CBT is different from problem-based learning (PBL) in that CBT requires the preceptor to guide the learning process whereas in a PBL scenario the learning is more self-directed by the student (Setia et al). The fundamental difference between CBT and PBL is PBL requires no prior experience or understanding in the subject matter on the part of the student, whereas CBT requires the student to have a degree of prior knowledge that can assist in working through the case (Williams).

CBT’s main traits are that a case, problem, or inquiry is used to stimulate and underpin the acquisition of knowledge, skills, and attitudes. Cases place events in a context or situation that promote authentic learning. Cases are generally written as problems that provide the student with the background of a patient or other clinical situation. The preceptor provides supporting information, such as the latest research articles, vital signs, clinical signs and symptoms, and laboratory results (Williams). CBT may take place in a formal environment with multiple learners, as in a grandrounds presentation, or it may be a more informal discussion between the preceptor and the student (Wetzel, Walters, Taylor).

By presenting all components of an actual case the preceptor provides the student with valuable insight into the clinical decision-making process and the practical factors that influence patient care decisions. When using this case discussion strategy, the preceptor begins by selecting a patient whose presentation and outcomes support the communication relevant teaching points. The preceptor should
provide as much insight as possible into why specific decisions were made; this will help the student grasp the concept of clinical reasoning. Missed opportunities or “near misses” — for example, the preceptor’s failure to ask a salient question about a particular case or a medication error that almost reached a patient — can serve as educational opportunities to help the student refine his or her knowledge and skills (Wetzel, Walters, Taylor).

Coaching
With Coaching, the preceptor guides the student verbally through a test or procedure. The intent here is for the student to practice a technique he or she has not mastered in a safe environment (Schupbach). Coaching usually follows Modeling in the student development cycle and should only be employed when the student is sufficiently prepared.

In the coaching scenario the student is asked to execute a previously modeled task or skill while the preceptor provides directive feedback — guiding phrases, step-by-step instruction, reminders, or encouragement — to the student along the way. The immediacy of the preceptor’s feedback enables the student to refine his or her skills in the moment thus preventing the formation of an incorrect habit. Some examples of coaching scenarios include the student performing a procedure, communicating with a patient or other health care provider, or conveying knowledge in a manner that is not yet automatic, such as a patient case presentation.

Coaching allows the student to gain practical, hands-on experience in a secure setting under the supervision of an expert. The preceptor should keep in mind that coaching opportunities should be in line with the student’s achievement of the desired learning competencies. As with modeling, “priming” the student prior to a patient encounter (i.e., orienting them to the patient and requisite tasks right before the encounter) is an important component of the coaching process (Wetzel, Walters, Taylor).
Assigned Directed Readings
Assigning Directed Readings is especially good for a student who has limited experience with certain kinds of patients, pathologies, and techniques (Schupbach, 2012). The preceptor should offer to discuss readings with the student to clarify any misunderstandings and discuss the application of information to the patient care practice (Wetzel, Walters, Taylor).

Self-Directed Learning
Self-directed learning, in its broadest meaning, describes a process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying resources for learning, choosing and implementing learning strategies and evaluating learning outcomes (Knowles, 1975). Lifelong self-directed learning (SDL) has been identified as an important ability for medical graduates (Harvey).

The first responsibility of the preceptor is to help students develop competence as self-directed learners. Different students have different abilities to be self-directed. Many students find that the idea of self-learning for the first time is so strange that they become overly anxious. They have been overly conditioned to having teachers tell them what they are to learn and how, that they become confused and worried when confronted with the responsibility of thinking through the process of learning. A good preceptor is one who motivates students and encourages a student to develop on their own.

Optional strategies you might use for doing this:

1. Ask the student to study a topic on his or her own coming to you only when they want help.
2. Team up students into small groups and ask them to pursue the topic independently as teams, coming to you only when they need help.
3. Involve all of a given group of students to pursue the specified subject coming to you only when they need help and having them analyze their experience.

Expectations for Preceptors

- Introduce the student to patients and staff, and explain the student’s role on the health care team.
- Give the student an appropriate amount of responsibility for patient care.
- Provide the appropriate amount of supervision.
- Encourage the student to take “ownership” of their patients.
- Be professional in your dress, demeanor, language and punctuality.
- Treat all health care providers and staff with respect at all times.
- Show empathy and compassion for patients and families.

Jeff Swain PhD, Faculty Development Program Director and
Menbere Dejenie, Education Research Analyst • 8
Some external direction is a necessary condition for self-motivated workplace learning. The preceptor is a vital source of organizational, pedagogic, and affective support (Dornan).
**Teaching Strategy: Modeling**

**Skills Taught:** Problem-solving, critical thinking, professionalism, psychomotor skills

<table>
<thead>
<tr>
<th></th>
<th>Prior</th>
<th>Teach During</th>
<th>Teach After</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intentional Engagement</strong></td>
<td>Prime:</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>What does the student need to know prior to the encounter (about the technique, thought process, etc.)?</td>
<td>Direct: What key movements, techniques, questioning/examination strategies do I want to focus the student’s attention on?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>How can he/she obtain that knowledge?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Purposeful Observation</strong></td>
<td>Direct:</td>
<td>Immediate before the encounter: What do I want the student to focus on during the encounter?</td>
<td>Direct:</td>
</tr>
<tr>
<td></td>
<td>What key movements, techniques, questioning/examination strategies do I want to focus the student’s attention on?</td>
<td>Summarize: Allow the student to ask clarifying questions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clarify your thought process and decision reasoning.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Look for opportunities for the student to practice the desired skill</td>
<td></td>
</tr>
<tr>
<td><strong>Critical Reflection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Teaching Strategy: One-Minute Preceptor
Skills Taught: Decision-making, meta-cognition, critical reflection

<table>
<thead>
<tr>
<th></th>
<th>Prior</th>
<th>Teach During</th>
<th>Teach After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intentional Engagement</td>
<td>Prime: What does the student need to know prior to the encounter</td>
<td>Direct: Reinforce proper actions—“You did a good job…”</td>
<td>Correct mistakes—“You did well, but…”</td>
</tr>
<tr>
<td></td>
<td>(something about the chief complaint, examination technique, etc.)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How can he/she obtain that knowledge?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purposeful Observation</td>
<td>Prime: Get a commitment—“What do you think is going on with the patient?”</td>
<td>Summarize: Teach general rules—“The key point to remember is…”</td>
<td>Look for opportunities for the student to practice skill deficiencies.</td>
</tr>
<tr>
<td>Critical Reflection</td>
<td>Probe for supporting evidence—“What leads you to that conclusion?”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Teaching Strategy: Case-Based Teaching

**Skills Taught:** Analytical thinking, reflective judgment

<table>
<thead>
<tr>
<th></th>
<th>Prior</th>
<th>Teach During</th>
<th>Teach After</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intentional Engagement</strong></td>
<td>Prime: What does the student need to know about the case prior to the discussion?</td>
<td>Direct: Tell the story of the case as it unfolded. Let the student see how your thought process worked based on the available data and how adjustments were made as new information came to light.</td>
<td>Show your reasoning process and justify why some actions were made over others.</td>
<td>Emphasize critical points in the treatment process and explain why.</td>
</tr>
<tr>
<td></td>
<td>How can he/she obtain that knowledge?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Purposeful Observation</strong></td>
<td>Prime: Ask open-ended and direct questions to gauge student understanding. Adjust your presentation as needed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical Reflection</strong></td>
<td>Summarize: Allow the student to ask clarifying questions.</td>
<td>Clarify your thought process and decision reasoning.</td>
<td>Look for opportunities to direct the student toward further information</td>
<td></td>
</tr>
</tbody>
</table>
**Teaching Strategy: Coaching**

Skills Taught: Psycho-motor skills, professionalism, clinical reasoning skills

<table>
<thead>
<tr>
<th></th>
<th>Prior</th>
<th>Teach During</th>
<th>Teach After</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intentional Engagement</strong></td>
<td>Prime: Model the behavior.</td>
<td>Direct: May have to model certain parts.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Set expectations for the encounter. Make clear goals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>What does the student need to know prior to the encounter (about the technique, thought process, etc.)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How can he/she obtain that knowledge?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Purposeful Observation</strong></td>
<td>Direct: Immediately before the encounter:</td>
<td>Direct: What key movements, techniques, questioning/examination strategies do I want to focus the student’s attention on?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What are the critical aspects of the case the student should focus upon?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>What should the student look out for?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical Reflection</strong></td>
<td>Summarize: Use the one-minute preceptor technique</td>
<td>Look for opportunities for the student to practice skill deficiencies.</td>
<td></td>
</tr>
</tbody>
</table>
References


Ohio University Heritage College of Osteopathic Medicine. Monograph: The One Minute Preceptor: 5 Microskills for One-On-One Teaching. [http://www.oucom.ohiou.edu/fd/monographs/microskills.htm](http://www.oucom.ohiou.edu/fd/monographs/microskills.htm)

Ramnarayan, K., Hande, S. Thoughts on Self-Directed Learning in Medical Schools: Making Students More Responsible. NEW HORIZONS FOR LEARNING, 2005 [http://education.jhu.edu/PD/newhorizons/lifelonglearning/higher-education/medical-schools/](http://education.jhu.edu/PD/newhorizons/lifelonglearning/higher-education/medical-schools/)


Rosen, L. Case-Based Teaching. Instructional Consultant for the Office of Faculty and Organizational Development. Michigan State University [http://fod.msu.edu/oir/case-based-teaching](http://fod.msu.edu/oir/case-based-teaching)


Williams, B. Case based learning—a review of the literature: is there scope for this educational paradigm in prehospital education? Emergency Medicine Journal, 2005, V22(8) [http://emj.bmj.com/content/22/8/577.full](http://emj.bmj.com/content/22/8/577.full)