CHAPTER 1
Adult learners in the emergency department

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Learning begins before birth and continues to death. Notably, the process of learning changes throughout life. Children study topics because an authority figure dictates that they must. The child may argue the applicability of the topic to the ''real world,'' but ultimately the child must learn the material.

Adults seek to learn because of a motivation to do so. Adults seek experiences that have an identifiable impact on life. However, the motivation for adult learning is not always from within; external forces also affect motivation. Adults sometimes seek education, not because they are excited about the subject but because they know it is in their best interest. Adults seek learning so as to better interact with the real world. This is the difference between adult and childhood learning.

The purpose of this chapter is to explore the principles of adult education as they apply to teaching in the emergency department (ED). Examples of the principles will be applied to the ED setting. The terms *learner* and *physician-in-training* refer to anyone in the position of learning. A ''teacher,'' an ''instructor,'' or an ''educator'' is the person at any level of training who is in the teaching role.

Learning theories

There are three recognized classic learning theories: behaviorism, cognitive learning, and constructivism [1]. Each of these theories influences curriculum design, teaching, and evaluation. Most

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educators use elements from each theory in any given situation rather than strictly adhering to one style.

Behaviorism is the learning theory commonly associated with the Pavlovian response: a subject performs a behavior and receives a positive result, and the behavior is reinforced. If the result is negative then the behavior is discouraged and eventually eliminated. The behaviorist does not focus on the thought processes of the learner, but only on the response to a stimulus.

The cognitive learning theory is the opposite of behaviorism. It focuses on the learner's thought processes instead of a response to a stimulus. The interest is in how the learner integrates new information and applies it to new situations.

In constructivism, the learner builds, or constructs, new ideas based on existing knowledge. Constructivism focuses on how students interact and learn from each other as well as from their educators.

Learning as a child

Pedagogy refers to the learning style of children. Its literal translation from Greek is ''to lead the child.'' This is a teacher-centered style of learning. Because children are not thought to have sufficient experience to know what they need to learn, these decisions are made for them by their educators. Instructors decide on what material to teach and how to teach it. Young students generally have little choice as to the content of their curriculum. Decisions and information flow cent percent from the instructor to the student.

Aspects of the pedagogical style also apply to some adult learning situations. For example, during the preclinical years of medical school, adult students have little choice regarding content. However, unlike secondary school students, adults have chosen this curriculum because of their motivation to become physicians. The curriculum is a means to an identifiable end, providing motivation.

Learning as an adult

As the study of learning advanced, adult learning enthusiasts recognized that children and adults receive and process new information differently. This recognition suggested that adults should be taught differently, prompting radical changes in adult education in many institutions. In the mid-1950s, Malcolm Knowles began publishing his work on adult education, which, at the time, was an underexplored subject. He popularized the term *andragogy*, which he defined as ''the art and science of helping adults learn.'' He observed that adults need to be involved in their education rather than being ''led''

to it. Childhood learning is teacher centered; adult learning is student centered. More on his theories is presented later in the chapter.

Pedagogical learning is based on discrete subjects: math, history, and spelling; or anatomy, cell biology, and pharmacology. This is appropriate for building lower levels of cognition, for the development of a foundation of knowledge. However, applying very basic knowledge, acquired in a pedagogical style, to real-world problems is more difficult.

Adult learning is more problem centered—an approach in which the learner pulls multiple bits of basic information from multiple, discrete subjects to solve a problem. Problem-centered learning is very relevant in the ED. For example, the ED physician, faced with a woman with right lower quadrant abdominal pain, simultaneously gives attention to all systems that may cause pain in this region. ''Is this gastrointestinal (appendicitis, gastroenteritis), gynecologic (ectopic pregnancy, ovarian torsion, pelvic inflammatory disease), genitourinary (ureterolithiasis, pyelonephritis), vascular (aortic dissection), or something else (shingles)?'' The clinician combines basic knowledge of these different systems and conditions with clinical experience to narrow the diagnostic possibilities and begin the appropriate evaluation.

Learning as an adult—Malcolm Knowles' theories and the arguments against them

Much of adult learning theory stems from five assumptions about adult learners that were developed by Knowles (Table 1.1). The assumptions reflect that adults are self-directed learners who seek information independently. They reconcile new information with their existing knowledge base and seek to apply it immediately to a known problem. It is important to note that these assumptions have not been validated.

Before embracing Knowles' theories blindly, one must note the many criticisms of his work. A commonly cited criticism was the

Table 1.1 Malcolm Knowles' assumptions about adult learning.

Adults are self-directed and autonomous
Adults have life experiences that need to be respected
Adults want to learn tasks related to everyday life
Adults are problem centered and seek to apply learned material immediately
Adults are motivated by internal drives rather than external factors

Adapted from [2] Kaufman DM. Applying educational theory in practice. BMJ 2003; 326: 213–216, with permission from BMJ Publishing Group Ltd.

inadequate data used for the formulation of the assumptions is a commonly cited criticism [3–6]. This vacuum is of particular concern in today's culture of evidence-based practice.

Norman [3] questions at what point a student transitions from a child learning to an adult learning style. It is not likely an age-based phenomenon, as chronologic and mental ages are not always congruent. He suggests that the transition is not effected by an internal condition of the learner, but rather by a change in learning style, needed to meet a new pressure or situation.

Some suggest that the motivation for adult learning is rarely exclusively internal and that it often stems from external forces [4, 6]. Adults might acknowledge only their conscious internal motivation, neglecting a subconscious external motivation. For example, physicians must receive continuing medical education (CME) to maintain their certification. A physician may satisfy an internal drive to learn more about dental emergencies by attending a lecture on this topic at a conference; the external motivation of receiving CME credits is also satisfied.

The assumption that all adult learning is self-directed is also debatable [3, 6]. Self-direction is a quality of a mature learner. A young learner may possess this quality, while a chronologically older student may not. In addition, before delving into any self-directed learning, students must do self-assessments to identify their weaknesses. Young students often perform inadequate self-assessments. The drive to learn is fed partly by success. Consequently, students are more likely to study topics with which they are familiar, feeding the hunger for success rather than focusing on weak areas. Adult learners facing new subjects may need a little ''pedagogical guidance'' from instructors.

Another criticism of Knowles' work is that he did not comment on the use of reflection in learning [6]. In reflection, the learner considers the new material, integrating it with preexisting knowledge and resolving conflicts between new and old information. The learner can consider how to approach a task the next time, based on successes and mistakes from the first experience. Taking time to reflect on a newly learned topic ingrains the material into one's mind.

Educating adults

Adults are experienced learners who derive part of their identity from life experiences. Adult learning is enhanced when educators demonstrate *respect* for adults and their experiences. Any dismissal of the learner's experience is perceived as a rejection of himself or herself [7]. With the learners' cadre of life experiences come habits that are well established and difficult to break [7]. Despite their

motivation to learn, adults are generally resistant to changing their habits. Educators must balance respect for the learners' experiences with needed modifications of problem habits. A poor balance risks alienating the learners.

Dependence on the teacher within a pedagogical structure is counterintuitive to adult learners. Adult learners seek to solve problems on their own using their previous experience. Instructors of adult students are seen as facilitators, not teachers. Facilitators are guides who do not merely hand out information but who help students to develop their own questions and to find their own answers. This develops student self-reliance and skills that will be useful in solving future problems. Knowles and others developed recommendations for these facilitators of adult students [2, 8], detailed with examples in the following section.

Adult learning in the emergency department

The ED is a rich, problem-based, learning environment. Most emergency medicine (EM) physicians are ''action-oriented'' people who say, ''I learn best by doing'' or ''I learn on my feet.'' The ED provides the ideal setting for such learning. The educational moments are ''live''; they are ''now.'' Skilled educators exploit these attributes of the ED, incorporating principles of adult education to create rich learning experiences for young clinicians.

However, the ED is not a comfortable learning environment. Constant distractions are normal. Time is limited and precious, creating a significant barrier to education in the ED. Faculty members are under increasing pressure to see more patients and improve documentation, limiting the time available for teaching. The balancing of time between patient care and teaching is simply another form of ED triage. Not all cases need to include an educational moment, nor must every aspect of each case be dissected to provide thorough teaching. Educators must choose their moments, as exemplified in the following sections.

Set the environment

Two environments can be optimized for learning: the physical and the interpersonal. The physical environment of the ED is a constant assault on all the senses, resulting in an array of distractions that is unparalleled in the world of education. Patients and providers are constantly on the move. Noise emanates from all directions. The lighting is harsh. The department is never big enough—patients overflow from rooms into hallway beds or large rooms with chairs and staff members compete for computer and counter space. Supplies run short, textbooks are old, and interruptions are frequent. New learners

in the ED also face sheer intimidation. Despite these inordinate challenges, learners must focus on quality, one-at-a-time patient care. It would seem impossible to make the learner to also focus on educational moments, one at a time. Teachers in the ED must choose their moments among the distractions. To the extent possible, distractions should be minimized: spaces away from the main center of the department can be used and nurses should be notified that interruptions should be minimized unless they are truly emergent. It is important to ''read'' your learner to see if he or she is ready for such a moment. If a student is too distracted with a current situation, you cannot effectively teach. Save the pearl for later.

Interpersonal or relationship setting is the most important piece in the entire educational endeavor. As noted earlier, adults have years of experience for which they expect, and deserve, respect. Establishing an open and respectful relationship with the adult learner is the most important first step in providing adult education. It is this relationship that encourages learners to come to their teachers; it makes the teachers approachable. Learning will not occur if the students do not want to approach or hear from the teacher. In the teaching ED, physicians-in-training must discuss their cases with a supervising physician; thus, it seems that the learners have no choice but to come to the teachers. However, if the learners do not have a good relationship with the teacher, they will modify their presentations in ways to minimize exposure to the instructors. When faculty members try to teach in the setting of poor relationships, learners will be minimally receptive. Tension can worsen with each encounter. Various reviews have described the characteristics of good teaching faculty (Table 1.2). It should be noted that they are all based on the establishment of an open and respectful relationship with the learners.

Set goals

Goals are the centerpiece of education. To the extent possible, adult learners should assist in determining their learning goals. Learners can reflect on their existing knowledge and identify gaps that must be filled. This strengthens their internal motivation and develops a sense of responsibility for their education. In an ED, goals can be established any time, including during orientation, at the beginning of a shift, or on the fly as a resuscitation is about to begin. However, learners cannot set these goals alone. Goals may emerge after negotiation between the student and teacher. Educator input is also valuable in ensuring that learners have set specific, achievable, measurable goals.

During orientation, off-service rotators and medical students should be asked to consider what they hope to achieve during their time in

Table 1.2 Characteristics of effective teachers. [9–14].

Enthusiasm
Psychosocial focus
• stresses relationships with patients and staff
• is patient centered
• understands personal perspectives and social values
• is humanitarian
Identifies self as a teacher
Communication skills
• listens to students
• has rapport with students
• is nonthreatening (approachable)
• asks questions carefully
• is clear and lucid
• is organized
Role model actions
• is positive
• responds to teaching needs
• listens to patients
• has rapport with patients
• emphasizes relationships
• emphasizes psychosocial aspects of cases
• is knowledgeable
• is clinically competent
Encourages education and independence
• actively involves students
• provides direction and feedback
• stimulates intellectual curiosity
• promotes self-direction

the ED. Many will have very limited goals. They should be challenged to expand their thinking. The ED is a place for non-EM physicians to face problems outside their chosen practice. Consider having the physicians-in-training establish a goal for the day at the beginning of a shift. It might focus on a portion of the history-taking process, such as asking each patient the nature of his or her employment. Alternatively, the learner can enhance physical examination skills, such as listening for a cardiac murmur in each patient. Educators can help the learners recognize unrealistic goals, such as improving their technique for chest tube placement.

Some non-EM rotators may want to learn all about EM while in the ED. Non-EM physicians-in-training often present unique challenges because they might have goals for the rotation that are different from their teachers' plans to teach them ''emergency medicine.''

An orthopedics intern might seek musculoskeletal injuries, while an internal medicine physician-in-training might conduct lengthy, inpatient workups on ED patients. It may be impossible to force these physicians-in-training to meet the instructors' desired goals. Negotiation becomes an important part of the process. Attempts to force certain goals on some learners will result in frustration for all. Admittedly, not all readers will agree with this opinion; some clinician educators believe that all rotators should be taught everything about EM.

Learners may struggle to choose goals. Instructors can assist by asking questions to identify areas of weakness. For example, a physician-in-training may say, ''I hate eye complaints.'' Questioning reveals that this aversion is related to a lack of comfort with performing a complete eye examination. If the physician-in-training is an EM physician, the instructor can ensure the examination is taught during the shift. If the learner is not an EM physician and has no interest in learning the details of the eye exam, then time might be wasted in trying to do so. It might be time to probe again and find a weakness that is of interest.

Plan and implement new material

Involving learners in planning educational activities has many benefits, including helping the facilitators identify possible problems before they become definite issues. Facilitators can redirect learners when they are offtrack and provide recommendations for problem-solving resources.

This technique applies easily to procedures. All care providers have preferred approaches for different procedures. Physicians-in-training may not have a broad-enough exposure to different techniques. Asking one to try a different technique or approach may result in some resistance. Asking ''Why do you think it may be valuable to know how to place internal jugular central lines rather than just femoral lines?'' may help the learner realize that not all approaches are available in all patients. Consequently, the physician-in-training gains motivation for learning a new approach. Having learners discuss procedures before they are done reinforces the appropriate steps and identifies knowledge gaps before undertaking the tasks. Being present during the procedure is ideal, although often impractical. It is reasonable to consider that different procedures have different levels of risks and thus different levels of need for the teacher's physical presence.

Educating during a procedure or resuscitation is difficult, but these complex scenarios offer new material that can be taught immediately. Educators naturally want to intervene and/or make comments, but doing so may be at the expense of the physician-in-training. These moments require the difficult balance of patient care with education.

Intervention by the teacher can embarrass the learner, potentially harming the student–teacher relationship. However, patient care is the most important consideration. There is no easy answer for these potentially conflicting interests; there are no absolutes. Minor mistakes by a physician-in-training can be just as acceptable as the teacher stepping in at a truly life-threatening moment. Those of us who practice EM know that the truly life-threatening moments, where key decisions in a matter of very few minutes will affect life, are few. Usually, there is time for the teacher to discuss the situation with the learner, facilitating and guiding. An excellent location for the teacher is right behind the learner. From this position, the teacher can quietly make comments to the learner, enabling the learner to remain ''in charge'' by being the one who speaks to the resuscitation personnel. Once the life-threatening moment has passed, mistakes can be addressed during the postresuscitation review. A debriefing after such encounters is imperative. This can be used to address areas of deficiency and needs for improvement and to complement the learner on decisions or actions that were correct.

Many teachers can draw on ''canned'' brief presentations, such as the causes and evaluation of syncope, the management of asthma when standard medications fail, the emergency causes of chest pain, or how to interpret a chest film. Educators keep these discussions fine-tuned and ready for use when the appropriate moment presents itself. These lectures are brief, usually no longer than 3 min; this helps the learner retain the information (by avoiding information overload) and does not significantly delay patient care.

Evaluate

By evaluating their learning experiences, adult learners identify ongoing knowledge gaps and recognize whether goals were met. These evaluations do not use formalized exams; they may be done with a brief discussion between the learner and the teacher. Reviewing key aspects of patient encounters can be very helpful, especially if it includes comments on previously established goals.

A verbal discussion (or evaluation) is routine during standard patient presentations by physicians-in-training. After the presentation of history and physical examination, a physician-in-training can be asked to formulate a differential diagnosis, can be asked what he or she wants to do from this point, and can be inquired about the thought processes behind both. This gives the educator an insight into the learner's understanding of the patient's illness as well as whether the learner has an appropriate diagnostic approach. This also is a chance for the educator to guide the learner back on track if the plan does not seem appropriate based on the presentation.

A similar recap should take place after the physician-in-training has undertaken a specific challenge, such as a new approach in a procedure. A similar line of query such as ''How did you think this went? What did you learn? What would you have done differently?'' gives the learner a moment to evaluate his or her own performance, again reinforcing the new material.

Role model

Role modeling is very important to education in the ED. In some ways, this is the easiest education that teachers deliver. It requires little thought or planning—it simply involves teachers being themselves. Amazingly, EM teachers may be unaware that they are role modeling. Physicians in any senior position should be aware that their behavior can be emulated at any time [15]. This can be the most difficult part of being a teacher, as you are ''on stage'' all the time. An EM teacher's every action or word is interpreted, and the interpretation may be very different from what was intended. Every verbal interaction is seen by at least one person, and the patterns soon become clear. For example, a disgusted look given to the technician for delivering another new patient's electrocardiogram is usually witnessed by many people. The challenge is to be the best human we can be as much of the time as possible. It is no surprise that most positive human attributes parallel the characteristics of an effective teacher (Table 1.2).

Observation of the history taking and physical examination of a patient by a teacher can be illuminating to learners. The clinician's techniques can be incorporated into their own routines: subtle uses of humor, good eye contact, and contact through a handshake. Educators can point out findings to the learners and explain why certain questions were used. Many medical educators stress the importance of bedside teaching, and certainly, demonstrating the skills of history taking and physical examination can only be done in this manner.

One of the most important items that can be role modeled is how the teacher thinks. For example, after having heard the differential diagnosis and plan from the physician-in-training, the teacher verbally explains his or her version of the same. This is more than just stating a differential diagnosis and plan. It is very powerful for the learner to hear the educator demonstrate his or her thought processes by ''thinking out loud.''

An instructor can model an experience that is difficult to teach, such as informing a family of the death of a loved one. The educator can identify specific techniques ahead of time, such as bringing a chaplain or nurse as an escort and clearly stating that the loved one died.

This serves as cues for which the learner should be watching as the role model proceeds in his or her task. Afterward, the instructor can ask the learner for his or her thoughts on the experience. This serves as feedback for the instructor and embeds the experience in the learner's mind.

Conclusion

Adult learners are self-directed and goal oriented, seeking information that they can readily apply. The ED provides many appropriate educational moments for adult learners. Educators can seize these moments by helping the learner set goals, serve as a guide on the learner's path to learning but not spoon-feed answers, and help the learner evaluate his or her performance to solidify the new information.

Summary points

1. Adult learners have internal motivation, frequently combined with external motivation, to actively seek new information, reconcile new information with existing knowledge, and plan to rapidly apply information to a problem.
2. Reflection on newly learned material or tasks serves to integrate the new material into a learner's brain, making it more readily retrievable in future experiences.
3. Adult learners need respect for their existing knowledge base from their educators.
4. Setting a positive interpersonal environment will help overcome the ED's physical impediments to learning.
5. Physicians-in-training must develop learning goals; learners must evaluate both independently and with their educator how those goals have been met.
6. Educators must be open to identify opportunities for learning in the ED, such as patient presentations by physicians-in-training, procedures, and resuscitations.
7. Educators should realize that they are always role models; their behavior, both positive and negative, is always on display for absorption by learners.

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