The Journey to Becoming an Adult Learner
From Dependent to Self-Directed Learning

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“Half of what you’ll learn in medical school will be shown to be either wrong or out of date within 5 years of graduation; the trouble is that nobody can tell you which half, so the important thing to learn is how to learn on your own.”

—David L. Sackett, OC, MD (1)

This statement by Dr. Sackett, who is considered the father of evidence-based medicine, illuminates the notion that given both the vast compendium of biomedical information and its rapid evolution, physicians have the professional responsibility to become self-directed life-long learners to provide superior, evidence-based clinical care. This self-directed learning paradigm contrasts starkly with the structure of our formal education from primary education through medical school, which was largely directed by educators who selected topics and learning materials, taught the material, and assessed our understanding. Although this other-directed learning paradigm has certain advantages, such as establishing a foundation of knowledge, it often can be isolated from practical application and may foster environments where learning goals are focused on achieving a specific grade or credit. This model has insufficiencies in the practice of clinical medicine, and thus we encourage fellows-in-training and cardiologists in their early careers to become self-directed learners by applying the principles of adult learning theory.

In contemporary medical training, most physicians begin to transition to self-directed learning in residency and fellowship. However, in a frank self-assessment, many of us realize that this transition remains incomplete. We, therefore, have set out to define the specifics of adult learning to develop our own framework for becoming self-directed life-long learners.

Although many models exist to explain adult learning, the best known of these efforts is andragogy (meaning “the art and science of helping adults learn”), which was described by Malcolm Knowles and is based upon the 6 following assumptions (2,3):

1. As a person matures, his or her “self-concept” moves from that of a dependent personality toward one of a self-directing human being.
2. An adult accumulates a growing reservoir of experience, which is a rich resource for learning.
3. The readiness of an adult to learn is closely related to the developmental tasks of his or her social role.
4. There is a change in time perspective as people mature, from future application of knowledge to immediacy of application.
5. The most potent motivations are internal rather than external.
6. Adults need to know why they need to learn something.

Few adult learners fully embody each of these principles, and thus, the principles may be best considered as prescriptive statements for what adult learning should look like. Knowles recognized that within this framework, the essential factor is self-directed learning, in which individuals take the initiative to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement appropriate learning strategies, and evaluate outcomes. Unfortunately, the traditional medical school curriculum often inadequately promotes self-directed learning, so physicians are often left to make this transition independently (4,5).

Despite this gap in early medical curricula, we have aimed to synthesize the strongest evidence available with reference to our own experiences and advice of colleagues and mentors to encourage the following recommendations for fellows-in-training and early career cardiologists on becoming self-directed life-long learners. The specific Knowles’ assumptions...
from which each recommendation was developed are provided in italics.

1. Take initiative and responsibility for your learning. Recognize that as an independent clinician your education is your own professional responsibility. You control what, when, and how you learn. It would be a mistake to assume that fellowship completion and board certification is tantamount to completion of your education. Be aware that didactic continuing medical education programs can have limited impact on physician behavior (6). Rather, recognize your particular educational needs and take responsibility for them by developing regular habits that promote learning. Knowles’ assumptions 1, 3, and 5 (2,3).

2. Develop an attitude of humility. Acknowledge uncertainty and admit when you do not know the answer. Recognize that overconfidence is an impediment to the pursuit of feedback and life-long learning (7). Knowles’ assumptions 1 and 5 (2,3).

3. Ask questions and seek answers. Sustain the inquisitive nature that compelled your interest in medicine and science and take the time to research answers to your questions. Learn to first efficiently perform a literature search to answer a focused question, then to critically appraise and select relevant resources, and finally, to make informed care decisions for the patient at hand and future encounters. Knowles’ assumptions 1 and 4 (2,3).

4. Develop a system for remaining up to date. Read both general and specialty journals regularly, create a journal watch for new papers in your field, utilize technology to store important literature with adequate labels for easy retrieval, and routinely attend conferences. Reject the tendency to settle into the role of a dependent or passive learner, such as relying on continuing medical education requirements to stay informed. Knowles’ assumptions 1 and 4 (2,3).

5. Critically reflect. Develop the habit of honestly assessing yourself. After a challenging clinical encounter, ask yourself: “How could I have done better?” Consider developing the practice of reflection through journaling. Your peers and patients are important sources for learning, so request feedback from them and conscientiously reflect on their input. Knowles’ assumptions 1 and 2 (2,3).

6. Set goals. Based upon your educational needs, develop clear, specific, feasible, and meaningful goals, and then formulate an achievable learning plan to accomplish these goals. In an iterative process, regularly reassess your progress and adjust and create new goals as necessary. Consider focusing on 1 or 2 specific topics at a time until you have mastered the information to avoid becoming overwhelmed. Knowles’ assumptions 1 and 5 (2,3).

7. Learn from your colleagues. When confronted with clinical dilemmas, ask for the opinion of your colleagues. Specifically, seek out the opinions of those with different training and background. If your colleague provides a recommendation without a clear explanation, spend the time to research the topic yourself. Ask noncardiology consultants to provide the rationale for their recommendations and the alternatives that they considered. Knowles’ assumptions 1, 2, and 4 (2,2).

8. Create. Seek out opportunities to give lectures, craft educational curriculum, engage in independent and collaborative research projects, write journal papers, and contribute to textbooks. According to Bloom’s Revised Taxonomy (a framework developed by psychologist Benjamin Bloom for categorizing educational goals), creating is the highest level of complexity of human thought and usually results in mastery of a subject matter (8). Knowles’ assumptions 1 and 2 (2,3).

9. Develop your mind. Incorporate nonmedical learning into your life. Learning in 1 area enhances and strengthens learning in other areas (9). Additionally, physicians become well-rounded and develop a more holistic perspective of their patients. Personally, I like to listen to audio books during my morning and evening commutes to accomplish this goal. Knowles’ assumptions 1 and 8 (2,3).

10. Learn with sense and meaning. Your brain is efficient and most likely to store information that is both logical and meaningful (9). Don’t just memorize, but rather fit new learning into a framework that makes sense to you. This takes extra work, but it will significantly improve retention. Additionally, always keep in mind the relevance to patient care and your own professional development. In which scenarios will you apply this knowledge or in which of your past encounters could this information have improved an outcome? If you can answer these questions, you are more likely to remember the information. Knowles’ assumptions 1, 4, and 6 (2,3).

Biomedical knowledge will continue to evolve rapidly, and it is our implicit duty to patients, families, and colleagues to continue to learn, adapt, question, and reflect in this fluid environment. As we
approach the completion of our cardiology fellowship and prepare to begin our careers, we acknowledge that our education is far from complete. We understand only a portion of what is currently known in our field, and it is daunting to expect that much of what we do know may become obsolete over time. The need to become self-directed adult learners has never been more apparent, and our previously-mentioned recommendations reflect our attempts to make this critical transition. Although they align with established educational theory, we would caution that they have not been rigorously evaluated in cardiology practice and require further study. We encourage each practitioner to recognize his or her need to become a self-directed learner, reflect upon the principals herein presented, independently research the subject (some useful references appear at the end of this paper), and fit them to his or her own practice needs. By doing so, you will have engaged in a practice that is the very essence of self-directed learning.

**REFERENCES**


self-directed learning paradigm contrasts starkly with the structure of our formal education from primary education through medical school, which was largely directed by educators who selected topics and moves from that of a dependent personality toward one of a self-directing human being. 2. An adult accumulates a growing reservoir of experience, which is a rich resource for learning. 3. The readiness of an adult to learn is closely related to the developmental tasks of his or her social role. 4. There is a change in time perspective as people mature, from future application of knowledge to a need to become self-directed adult learners has never been more apparent, and our previously-mentioned recommendations reflect our attempts to make this. An adult learner or, more commonly, a mature student, is a person who is older and is involved in forms of learning. Adult learners fall in a specific criteria of being experienced, and do not always have a high school diploma. Many of the adult learners go back to school to finish a degree, or earn a new one. Malcolm Knowles's work distinguished adult learners as distinct from adolescent and child learners in his principle of andragogy. He established 5 assumptions about the adult learner. This