

Education: An Essential Leg for Anesthesiology's Four-legged Stool!

Editor's Note: This is the first in a series of four Editorial Views describing challenges and new approaches in education in our specialty.

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ANESTHESIOLOGY encompasses four key activities: patient care, education, research, and practice administration. Similar to a four-legged stool, Anesthesiology is fine if all its "legs" are the same length and sturdy, that is, you can confidently "sit on it, use it as a stepladder, even stack stuff on it."* When you test the "Anesthesiology stool" what do you discover about its legs?

Many anesthesiologists are facile clinicians, always ready to competently care for another complicated patient; others are inquisitive scientists, developing the evidence base to create new knowledge; more demonstrate administrative expertise and effectively and efficiently manage practice environments and groups; hence, three legs of the anesthesiology stool seem assured.

What about the "education leg?" Often, it is short and weak; "the stool is lopsided when you sit on it, gives you a scare when you use it as a ladder and the stuff you stack on it slides off onto the floor."* If anesthesiology hobbles along without a strong education leg, this is a recipe for disaster and unsafe patient care.* A strong education leg will allow anesthesiologists to devote more time and energy in studying, measuring, and applying more scientifically based approaches to our teaching. Educators need a forum to share processes and tools to measure the outcomes of their teaching efforts. Students of anesthesiology will benefit greatly when the education leg is solid, that is, life-long learning will become an integral part of the fabric of the clinician. This and the three companion Editorials, in the subsequent issues of ANESTHESIOLOGY, are designed to focus on several of the key aspects of education to raise our level of awareness so that we will focus on teaching to assure that the "education leg of Anesthesiology" is as long and strong as its three sister support legs.

Anesthesiology education is a vibrant activity. The enterprise is vast. In the United States in 2008, (1) accredited Graduate Medical Education programs included 131 core anesthesiology residencies and 136 subspecialty fellowship programs educating 5,208 residents and 396 subspecialty

anesthesiology fellows¹; (2) 71,578 medical students received some modicum of anesthesiology education²; and (3) 102,572 graduate medical education trainees in nonanesthesiology specialties (a 5% increase from 2005) clamored for anaesthesiology-related education (*e.g.*, airway management, vascular access, and safe local anesthetic use).¹ The number of full-time clinical anesthesiology faculty responsible for providing anesthesiology education is more than 6,000.³ These numbers increase even more when nurse anesthesia (>1,200/yr) and nonphysician healthcare professional (>230,000/yr) students are included in the anesthesiology teaching activity.⁴ Addition of the large number of medical, graduate medical education, and nonphysician healthcare students worldwide solidifies the huge responsibility of anesthesiology education. Also remember that all anesthesiologists, as role models, further the understanding of our profession by becoming better teachers of other physicians, such as surgeons, neurologists, hematologists, pediatricians, and intensivists, and of nurses, anesthesia technicians, and the institutional officials with whom we work.

How will all these students best learn anesthesiology from us, their teachers? Answers to this critically important question about students and learners come from thoughtful consideration of a definition of education⁴:

Education is change in behavior based on experiences.

Assuring excellent experiences requires comprehensive answers to another question⁴:

How shall who teach what to whom for what purpose?

(D. Eric Greenhow, M.D., University of Pennsylvania, Philadelphia, PA, verbal communication, July 1982.)

First and foremost, we must understand *who we teach*. Anesthesiologists are adult learners. In distinction to children who receive education from a teacher who says, "Learn this because I say so," adult learners seek education and are (a) self-directed, (b) goal oriented toward relevant professional needs, (c) repositories of a wealth of knowledge and experiences upon which to build, and (d) selective in their use of time for and the types of learning experiences in which they will participate.⁵ Teachers who do not acknowledge these adult learner traits will have students who learn less. Take the anesthesiology resident, for example, who has completed a

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* http://www.balanceyourbooks.com/four_legged_stool.shtml. Accessed and paraphrased August 26, 2009.

postgraduate year devoted to learning internal medicine, spending 3 months in a critical care unit learning to manage mechanical ventilators. When teaching about anesthesia ventilators, if the teacher does not assess the resident's educational experiences, the education will be less effective, less efficient, and seem to reject the resident's previous learning, which should be a springboard for expanding what has already been mastered.

Second, we must understand *who teaches*. Physician teachers have little training as educators; they have not learned about educational psychology or methodology, they rarely read medical education journals and for the most part subscribe to the, "See one, do one, teach one." philosophy.^{6,7} This philosophy is clearly ineffective, for example, for teaching Chopin's "The Minute Waltz"; Anesthesiologists should similarly not support teaching skills such as cardiopulmonary resuscitation, fiberoptic airway management, or one-lung anesthesia with a "See one, do one, teach one." philosophy.^{6,7} Also consider the upside down reality of medical education teaching responsibility; junior faculty have a heavy teaching obligation; yet, they are less likely to have teaching expertise than more senior faculty.⁸

How do we teach best? Adult learners are well suited for active learning. Anesthesiologists, for example, need to learn cardiopulmonary resuscitation protocols. Many students have fallen asleep during a cardiopulmonary resuscitation lecture, but none has done so during a mock code simulation exercise. Little is learned when the teacher asks a closed question such as "What is the dose of propofol for induction of general anesthesia for a 65 kg 42-yr-old man?" because the answer is predictable, from a limited range of correct responses and requires fact recall and very little thought on the part of the student.⁷ Open questions such as "Explain your reasons for selecting propofol for induction of general anesthesia for a 65 kg 42-yr-old man," require higher levels of thinking and facilitate greater learning as they are directed at problem solving, assessing the whole patient, and using judgment to develop an answer, that is, an anesthetic plan.⁷

Why do we teach and learn anesthesiology; what is the purpose? For anesthesiology, the teaching and learning goal is to enable learners to become excellent high-stakes decision makers, that is, competent practitioners. The American Board of Anesthesiology explicitly defines the fundamental purpose for our specialty education:

Anesthesiologists must learn "knowledge, judgment, adaptability, clinical skills, technical facility and personal characteristics sufficient to carry out the entire scope of

anesthesiology practice . . . logically organize and effectively present rational diagnoses and appropriate treatment protocols . . . be able to manage emergent life-threatening situations in an independent and timely fashion . . ."[†]

Documentation of positive outcomes (competency) through summative evaluation is difficult at best and an area that must be developed in a more sophisticated manner if our educational purpose is to be meaningful; this scholarly work provides an enormous challenge and an opportunity for anesthesiology.

To reach our educational goal, we must decide *what do we teach*. In the United States, the current curriculum for the core anesthesiology residency is 4 yr of education subsequent to medical school graduation; a clinical base nonanesthesiology year and 3 yr of learning all aspects of anesthesia patient care from the basic clinical protocols to highly sophisticated subspecialty anesthesiology training in and outside of the operating room[‡]; there are even options for research education that are encouraged although rarely elected. Is this the correct paradigm for anesthesiology education and does it fit the current and future paradigm for our specialty and subspecialty practice? Should core resident education be standardized with a "one-size fits all" approach or should residents devote, for example, 2-yr learning fundamentals and then branch off, according to their interests, into education for a time period longer than that is currently set aside for subspecialty education?

Answers to all the questions posed in this consideration of anesthesiology education that are better than currently exist must be provided! The challenge to finding the answers is perhaps best characterized by Alice, during her journey in Wonderland:

"Which road should I take?" asked Alice.

"Where do you want to go?" asked the Cheshire cat.

"I don't know," replied Alice.

"Then it won't matter which road you take," answered the Cheshire cat.⁹

To teach and learn anesthesiology effectively and efficiently and assure that the education leg of the anesthesiology stool is solid, we need a sound current and forward looking approach; unlike Alice, we must know where we want to go with education.

ANESTHESIOLOGY will play a vital role in helping us know where we want to go. This journal will continue to publish evidenced-based educational research; anesthesiologists must conduct these investigations to further our understanding. Although ANESTHESIOLOGY already publishes educationally focused manuscripts, starting with this issue, the journal will in addition and regularly publish more of these offerings. These articles (Case Scenarios in Anesthesiology and Images in Medicine) will serve as learning resources for all students of anesthesiology; anesthesiologist educators must write these pieces for life-long learning.

† <http://www.theaba.org/Home/publications#boi>. The American Board of Anesthesiology, Inc. Booklet of Information. Certification and Maintenance of Certification. Raleigh, NC, 2009. Accessed August 26, 2009.

‡ http://www.acgme.org/acWebsite/RRC_040/040_prIndex.asp. Accreditation Council for Graduate Medical Education. Anesthesiology Program Requirements. Chicago, IL, 2009. Accessed August 26, 2009.

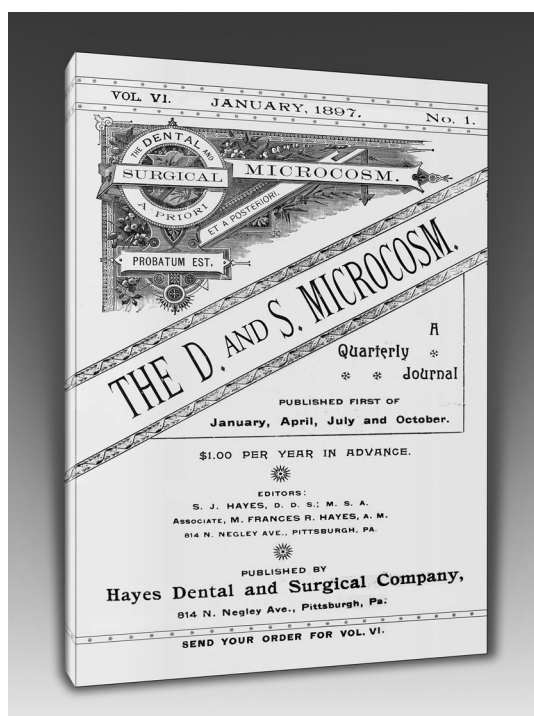
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ANESTHESIOLOGY REFLECTIONS

The Final *Dental and Surgical Microcosm*



This month, January of 2010, marks the 113th anniversary of the final issue of *The Dental and Surgical Microcosm*, or *D&SM*. As it had been from 1891 to 1897, all issues of the *D&SM* had been indexed and subtitled as “A Quarterly Magazine, Devoted Chiefly to the Science of Anaesthesia and Anaesthetics.” During its 6.5-yr publication run, *D&SM* was never challenged about its claim of having been “the first and only journal in the world devoted chiefly to the science of Anaesthesia.” The world’s first anesthesia journal ceased publication when its proprietor and controlling editor expired in June of 1897. (Copyright © the American Society of Anesthesiologists, Inc. This image appears in color in the *Anesthesiology Reflections* online collection available at www.anesthesiology.org.)

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