

## **YOU'RE A NEUROLOGIST. DO YOU KNOW HOW TO TEACH NEUROLOGY?**

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Medical students are very bright and motivated. They have come a long way and have worked hard to get into medical school. Most of them will do very well regardless of how they are taught. However, it seems wrong not to give them every advantage in becoming the best they can be during the four short years of medical school.

I have heard physicians say that despite any curriculum bad or good the cream will always rise to the top—good students will always do well. The only problem with that philosophy is that the rest of the bottle will be going out to care for patients, too. It seems a shame not to make medical education the most effective, stimulating and motivating experience it can be.

Faculty physicians have been thoroughly trained for both their patient care and research responsibilities, but not for their educational responsibilities. Yet their responsibility is to offer the best education possible for students who have earned the right to be in medical school and are paying for their education. Education is a serious responsibility. It is even more serious when you realize this teaching responsibility involves the preparation of the future physicians and researchers who will be following us.

The standard approach of feeding the students the important information they need in lectures while they sit passively taking notes does not fulfill this responsibility. And giving them written or oral tests that measure how well they regurgitate that information does not ensure their learning. After cramming for the test is over, they will forget most of the information they were given in lectures. This ubiquitous and ancient educational practice produces what Alfred North Whitehead referred to many years ago as "inert knowledge" – knowledge that is only useful for answering questions, but cannot be adapted or applied in any practical or useful way to problems or situations.

Knowledge that is going to be useful has to be actively acquired by students, built on what the students already know, and cross referenced with knowledge from other disciplines. It has to be manipulated and applied in meaningful clinical contexts so that it will be recalled and applied in the clinical situation. Under faculty guidance, students must learn to become responsible for their own education, enabling them to continue to learn the rest of their professional lives to stay contemporary and deal with the new problems and situations they will inevitably encounter in their work. Also while under faculty guidance, students should acquire effective and efficient clinical reasoning skills through continual practice and feedback. Tests should assess students' ability to apply the information acquired to the understanding and care of medical problems and the basic science mechanisms responsible. Teaching faculty should not continue to offer horse and buggy traditional education,

teaching the way they were taught when they were students. They carry out their patient care and research responsibilities with the most up-to-date knowledge and techniques available; the same should apply to their educational work. This is especially true now when so much useful information is from educational research and development has become available.

Over the last three or more decades, a growing body of information about learning has been accumulated in many fields such as: cognition, educational psychology, neuroscience, anthropology, and computing. The National Science Foundation now refers to this body of knowledge as the science of learning. The NSF is encouraging continuing research by scientists in all disciplines into the science of learning and its application by teachers. Much of this is relevant to medical education and represents for us a basic science for educational practice. Over the same period, a number of journals dedicated to medical education have come into being, putting much of this new information into practice. In addition, a wide armamentarium of new techniques to support and evaluate learning has been developed, such as: a variety of simulations (including virtual reality), performance-based assessment methods, multimedia and

computer techniques, and distance learning approaches.

A formal educational program is required to prepare physicians with teaching responsibilities to take full advantage of the knowledge in learning science and the programs and techniques now in existence. There are a number of programs around the country that offer training in education for physicians. Those physicians whom I have encountered who have had educational training at the masters or doctorate level have made and are making valuable contributions to the curricula in their schools and to the field of medical education.

All physicians – not just those with formal teaching responsibilities – need training in education. Education is utilized by physicians in many different venues: with their patients, patient groups, community groups, in continuing education workshops and with other health professionals. Yet, training in education is notably absent from medical school and residency curricula. It should start there to produce future faculty with skills in medical education commensurate with the trainees' evolving skills and knowledge in research and patient care. An educationally sophisticated medical school faculty is needed to pull this off, however.

The University of Sherbrooke provides a good model for what can be done to get teaching faculty out of the horse and buggy era in their educational work. When that medical school decided to undertake what has turned out to be a very successful curriculum, a series of well-designed programs for teaching development were put together by Jaques DesMarchais and his collaborators early on in the revision process. The programs were given unequivocal support by the school's leadership and were led by knowledgeable and experienced teachers. This support was supplemented by the fact that the school made it clear that training in education was a priority, and by a system that openly acknowledged teaching accomplishments by the faculty. As a result, the program enjoyed a high participation rate and contributed to an enhanced interest in education as well as a change in teachers' education philosophy. In addition, this educational program was designed to facilitate the ability of teachers to continue on and get a master's in education or cognitive psychology.

I'm aware that the AAN is considering certification in specialty areas within neurology, and I would encourage education being one of them. Certification should be a requirement for neurologists who are to take on positions with significant responsibilities in teaching.