

Competencies Over Courses in Medical Education

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Modern technology has allowed medical innovation to take place more rapidly than ever before, often fundamentally altering the field. Doctors are required to have in-depth knowledge that changes as medicine moves forward, but many say the dominant system of medical education — often centered around outdated course requirements and rote memorization — is not keeping up. Instead, experts are pushing for a competency-based science curriculum that evaluates medical and premedical students based on their application of broad and overarching skills, rather than specific facts learned in required courses.

The Association of American Medical Colleges, in collaboration with the Howard Hughes Medical Institute, on Thursday released a report aimed at defining these scientific competencies. The paper, "Scientific Foundations for Future Physicians," identifies eight competencies in the medical school curriculum and eight in pre-med programs that all students should master on their way to becoming doctors. In doing so, the report's authors hope to update the knowledge base in medical education while also shifting the paradigm of teaching away from restrictive required courses. This paper joins a 1998 AAMC report that set forth social and behavioral competencies in medical education.

"All physicians need a strong foundation on which to base the art and heart of [medicine]. They need the heart to care and the art to communicate," said Carol Aschenbrener, executive vice president at AAMC. "We know science has changed a lot and new information is coming to light. We've not changed our educational approaches in light of that. The report is trying to shift people away from focusing on courses and more on what to do with scientific information — what you want the entering student to be able to do. One can arrive at competencies in many ways through interdisciplinary approaches."

The committee that formulated the report brought together medical educators from universities and colleges of different sizes across the U.S. to reach a consensus on

what facets of science are important for tomorrow's doctors. The competencies include such skills as applying "knowledge of molecular, biochemical, cellular, and systems-level mechanisms ... to the prevention, diagnosis, and management of disease," as well as utilizing the concepts of physics, genetics and immune systems. For pre-med students, the competencies focus on the application of more basic skills that lead readily into the medical school program. The overarching goal of these specifications, however, is to encourage the study of the concepts underlying medicine, rather than specific facts.

While most medical schools have emphasized competencies for years, said Robert J. Alpern, dean of Yale's School of Medicine and co-chair of the committee that produced the report, the report holds special significance for pre-med programs that are often too rigid and focused. The updated competencies for pre-meds put less emphasis on fields like organic chemistry and calculus that now dominate pre-med curriculum, focusing more on biochemistry, statistics and database mathematics. The report also clarifies more specifically what types of biology are most important.

"To tell you the truth, the biggest change will be that science education will become much more interesting," Alpern said. The report "is basically giving the freedom to colleges to make it interesting. One of the things that led to this committee meeting was a report from the [National Research Council] saying that pre-med requirements were forcing students to take these classes that they didn't want to take. That's a concern, that a small number of students are going into the sciences. We need a curriculum that attracts students."

But revising the way students learn also involves revising the way they are evaluated. Last year, an AAMC committee began the process of comprehensively reviewing the Medical College Admissions Test, which has long been criticized for its undue emphasis on memorization. The committee will pass its suggestions on to the MCAT Review Board in 2012.

The idea of a shift toward competency-based learning has been circulating around medical schools — and all of higher education — for quite some time. In 2001, Richard Voorhees, associate vice president for instruction and student services for the Community Colleges of Colorado System, released a report detailing the spread of competency-based learning, citing it as a revolution in higher education. The focus

on overarching goals in any type of education, he said, requires “bundling and unbundling” to find the “optimal combination of skills and knowledge needed to perform a specific task.”

For example, Alverno College, a Catholic woman’s college in Milwaukee, is considered a leader in this type of learning. It outlines eight social, educational and behavioral goals for its students, termed Alverno’s Eight Abilities, which it seeks to instill in all its students. The college grades students through a system called “Student Assessment-As-Learning,” wherein undergraduates are evaluated based on the process of learning and the goals they achieve through a combination of peer review, outside assessment, and faculty oversight.

In medicine specifically, Jo Shapiro, chief of otolaryngology at Brigham and Women’s Hospital and a professor at Harvard Medical School, has long touted the need for mandating competencies in medical education. In 2003, she was a key figure in implementing the Outcome Project of the Accreditation Council for Graduate Medical Education, which similarly sought to introduce competency-based assessment to medical residencies. The switch — the effects of which are still being felt — has introduced a 360 degree review to the residency programs. Before competencies were introduced, the program director usually signed off on the requirements, often with only the knowledge that residents had completed their training, not full confidence that they had learned the necessary medical tools. Now, residency programs, with the guidance of the ACGME, require full-scale assessments from people as diverse as nursing staff and respiratory specialists.

The new report from the AAMC and Howard Hughes represents the latest step in spreading competency-based learning through the medical education system. Alpern, who has already presented the report to a number of college deans, said he had received a lot of positive feedback.

“What can I say other than ‘Thank God,’ ” said David Muller, chair of medicine at the Mount Sinai School of Medicine, in reference to the pre-med competencies. “The current requirements ... are almost exactly the same as 100 years ago.... We are basically making students learn information that is outdated in terms of its direct application to medical knowledge or medical research.”

Muller added that Mount Sinai began a program 20 years ago to admit humanities students early in their college careers, who had no pre-med background, with the understanding that they would not take typical pre-med courses. Historically, he said, these students have always done just as well as or better than the students who enroll after going through the normal pre-med curriculum.

Implementation of these competencies, he says, is realistic as long as the MCAT undergoes fundamental changes and some other form of assessment of these competencies takes its place.

"The MCAT is such an important filter. You can't get in unless you take the MCAT and you can't take the MCAT without the [current] requirements," he said. "You either have to change the hoops [one jumps through to get in] or get rid of the hoops."

Shapiro of Brigham and Women's sees the competencies introduced in the report as a set of guidelines that is hard to argue with, and believes that most of them will stand the test of debate. Mobilizing a broad-scale change of the education system is about persuading people of its necessity.

"First you have to create the burning platform of 'we have to change this and here's why,' " she said. "You have to convince people the paradigm shift is worthy."

Like Muller, Shapiro believes that the next step will be finding ways to assess this new curricular focus, an arguably more difficult task. After that, she said, the pieces should begin to fall into place.

On the other hand, Tim Austin, vice president for academic affairs and dean of the College of the Holy Cross, who has been outspoken on the need for pre-med curriculum reform, sees full implementation of these competencies as a lofty goal. As someone who works directly on designing the pre-med curriculum, he understands the importance of scientific competencies, along with social and behavioral competencies achieved by taking liberal arts courses. However, he thinks that entirely shifting the direction of pre-med education would take a massive amount of money and time.

"I simply want to be realistic about the massive scope of the changes that the committee proposes," Austin said in an e-mail. "The report outlines an intriguing

approach to rethinking premedical education and it deserves careful consideration. The question is where the discussion should go from here.”

Austin postulated that a possible next step could be to identify pilot undergrad programs to implement the curriculum reform and give them enough grant money to implement the program. Even then, everyone would need to get behind these changes, including MCAT administrators, to persuade medical school applicants to forgo the current requirements.

Alpern, on the other hand, sees a reform of the current MCAT as a possible first step.

This is the start of what promises to be a vigorous conversation among medical educators about how to educate the next generation of doctors. Aschenbrener said she hopes to hear feedback about which competencies make sense, which should change, and which should evolve with further advances in medicine.

“That’s why we felt we should outline competencies,” Alpern said. “We wanted to take a 10,000 foot look at it and not be too detailed.”