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Pre-Med Programs Eye Curriculum to Prep Students for New MCAT® Exam

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—By Jen Uscher, special to the *Reporter*

Pre-med students who entered college last fall will be among the first to take the new Medical College Admission Test® (MCAT®) that will be introduced in the spring of 2015. At colleges and universities across the country, pre-medical advisers and undergraduate faculty are trying to determine which courses students should take to prepare for the new MCAT exam and whether to make any changes to their curricula.

For the first time, the exam will include questions about biochemistry and feature a new section that tests knowledge of introductory psychology and sociology concepts, as well as introductory biology concepts that provide the foundation for learning about the behavioral and socio-cultural determinants of health. Another new section will test critical analysis and reasoning skills by asking students to analyze and evaluate passages from a wide range of social sciences and humanities disciplines, including cultural studies, population health, ethics, and philosophy.

Karen Mitchell, Ph.D., AAMC senior director of admissions testing, said some colleges and universities already were thinking of changing their pre-med and pre-health curricula to put more emphasis on those concepts and skills. “The changes to the exam are consistent with what’s going on nationally in science education reform,” she said. “They reflect the ways that educators are organizing teaching and learning around competencies in the natural and social sciences.”

At Harvard University, the only new recommendation premed advisers are making to students who plan to take the new MCAT exam is to enroll in an introductory psychology course. The set of science classes they suggest taking has not changed.

“We feel our existing science curriculum is in line with what medical schools are looking for and with the content of the revised MCAT exam,” said Sirinya Matchacheep, Ph.D., assistant director of pre-med and health careers advising at Harvard. “Most of our introductory courses in chemistry and life sciences, for example, already require students to do quantitative analysis, make connections between disciplines, and solve problems.”

Like Harvard, Emory University is not adding new classes to cover the content of the revised exam. Many of the competencies that will be tested on the new exam are taught in classes that undergraduate students already take to fulfill their general education requirements, according to Shari B. Obrentz, Ph.D., assistant dean in the Office for Undergraduate Education and director of the Pre-Health Mentoring Office at the Emory College of Arts and Sciences. For example, she noted that many students take a statistics class because it is required for their major, and they can choose from a variety of classes that will expose them to behavioral and social sciences.

Other schools are opting to enhance existing courses or develop new ones to better prepare undergraduates for the new MCAT exam. The University of California, Los Angeles (UCLA), received a Howard Hughes Medical Institute (HHMI) Science Education Grant and a Course, Curriculum, and Laboratory Improvement Grant from the National Science Foundation that funded the development of a new research-based laboratory curriculum for life sciences majors. Two of the five life sciences departments at UCLA piloted this program, known as the Competency-based Research Laboratory Curriculum (CRLC), in the fall of 2010. The curriculum is designed to help students prepare for the MCAT exam by building their ability to apply scientific knowledge and communicate with others about scientific research.

All the undergraduates in two majors—microbiology, immunology, and molecular genetics, and molecular, cell, and developmental biology—take part in a 20-week research experience. Some conduct a mentored, independent research project in a faculty lab, and others take a series of courses in which they complete team research projects. The students with the independent projects take research seminars that involve primary literature investigations, discussions, and formal writing about their projects in various report formats. Those completing team-based projects take courses that give them experience devising and conducting experiments,

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analyzing data, writing papers, and making oral presentations.

“The idea is to immerse all of our undergraduates in an authentic research experience. We want them to have a broader understanding of the research process that incorporates some social and behavioral issues, like how to be a good lab citizen and a constructive communicator,” said Erin R. Sanders, Ph.D., UCLA adjunct assistant professor and academic coordinator of microbiology, immunology, and molecular genetics. She also is the co-director of the HHMI Science Education Grant and director of the CRLC.

The University of Maryland, Baltimore County (UMBC) is using grant funding as well to create new courses that teach the competencies students will need for the new MCAT exam. UMBC is one of the four universities that receive funding from the HHMI’s National Experiment in Undergraduate Science Education (NEXUS) project. Faculty teams at each university work together to create and share interdisciplinary science curriculum modules that can be added to existing courses.

The NEXUS project team at UMBC is developing curriculum modules that infuse mathematical modeling into biology. These modules, which can be adapted to different levels of biology classes, focus on mathematical concepts students will need both in future courses and in their careers as health professionals.

William R. LaCourse, Ph.D., dean of the College of Natural and Mathematical Sciences at UMBC and chair of the executive steering committee of the NEXUS project, also is putting together a committee to develop an upper-level course in which students would use the competencies they have developed in various classes by applying them to medical case studies.

“It’s a course I think every pre-med student will line up to take, and it will inspire them,” he said, adding that the course would draw on case study curriculum modules developed by the NEXUS project team at the University of Miami.

In the future, the NEXUS project teams plan to continue to pilot and refine their curriculum modules and make them publicly available—possibly on a Web site—so that instructors at universities across the country can use them.

To help faculty, pre-health advisers, and students prepare for the new MCAT exam, the AAMC is offering a number of free online resources. For example, the AAMC established the Pre-health Collection within the MedEdPORTAL® iCollaborative to help faculty who are teaching pre-health competencies.

“We created a searchable collection of instructional materials so that faculty at any institution—but particularly those at underresourced institutions—can make changes to their curricula and enhance existing courses more easily,” said Jen Page, M.Ed., AAMC director of MCAT preparation products.

In addition, undergraduate faculty and pre-health advisers can use the Course-Mapping Tool for the MCAT2015 Exam to identify the courses at their institution that teach the knowledge and skills that will be tested on the new exam. The tool, in a downloadable, pre-formatted Excel spreadsheet, prompts users to match exam content to courses and allows them to see if any of the topics are not taught on their campus. Another downloadable resource, *The Preview Guide for the MCAT2015 Exam*, describes the new test’s content and format and provides sample test questions.

Page noted that the AAMC will add more resources to the Web site in the coming months. Online video tutorials about concepts that will be tested on the new MCAT exam, created as part of a collaboration with the Khan Academy and the Robert Wood Johnson Foundation, will be posted this fall in the Pre-health Collection within the MedEdPORTAL iCollaborative and in the Khan Academy’s online learning library. And starting in January, students will be able to order an updated edition of *The Official Guide to the MCAT® Exam*.

“We’ll continue to update the tools on our site and identify other resources we can make available to support students, faculty, and pre-health advisers,” Page said.