

Final Recommendations for the 2015 MCAT Exam

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Why did we review the MCAT exam?

- A 21-member advisory committee reviewed the MCAT exam to determine if it provides admissions committees with valuable information about their applicants' academic readiness and reflects their schools' goals for tomorrow's physicians.
- In standardized testing, periodic reviews of examinations are considered a best practice and are particularly important in fields with rapidly-changing knowledge.



Why did we review the MCAT exam?

- This is the fifth time MCAT was reviewed since its first administration in 1928.
- The current exam has been in use since 1991.
- The new version of the test is likely to be in place through 2030—with a plan to refresh it midway through so the exam keeps pace with changing science.





What did we accomplish?

- Began our work on the future test in fall 2008
- Did a lot of fact finding
- Solicited input from several blue-ribbon and advisory committees, including:
 - Scientific Foundations for Future Physicians Committee
 - Behavioral and Social Sciences Foundations for Future Physicians Committee
 - Holistic Review Project Advisory Committee





What did we accomplish?

- Received over 2700 completed surveys from baccalaureate and medical school faculty and administrators, residents, and medical students
- Solicited input on the future exam at over 90 outreach events
- Published project brochures, newsletters, and data reports
- Posted these and videos on the MR5 website
- Sent regular e-newsletters to over 4000 stakeholders





What did we accomplish?

- Presented the preliminary recommendations to AAMC's Board of Directors last February and the recommendations were favorably received
- Released them to the AAMC and pre-health communities and press in March
- Discussed them in over 20 national, local, and trade papers and in over 30 student newspapers
- Presented them at the spring GSA and NAAHP meetings and at other meetings and conferences this spring and summer



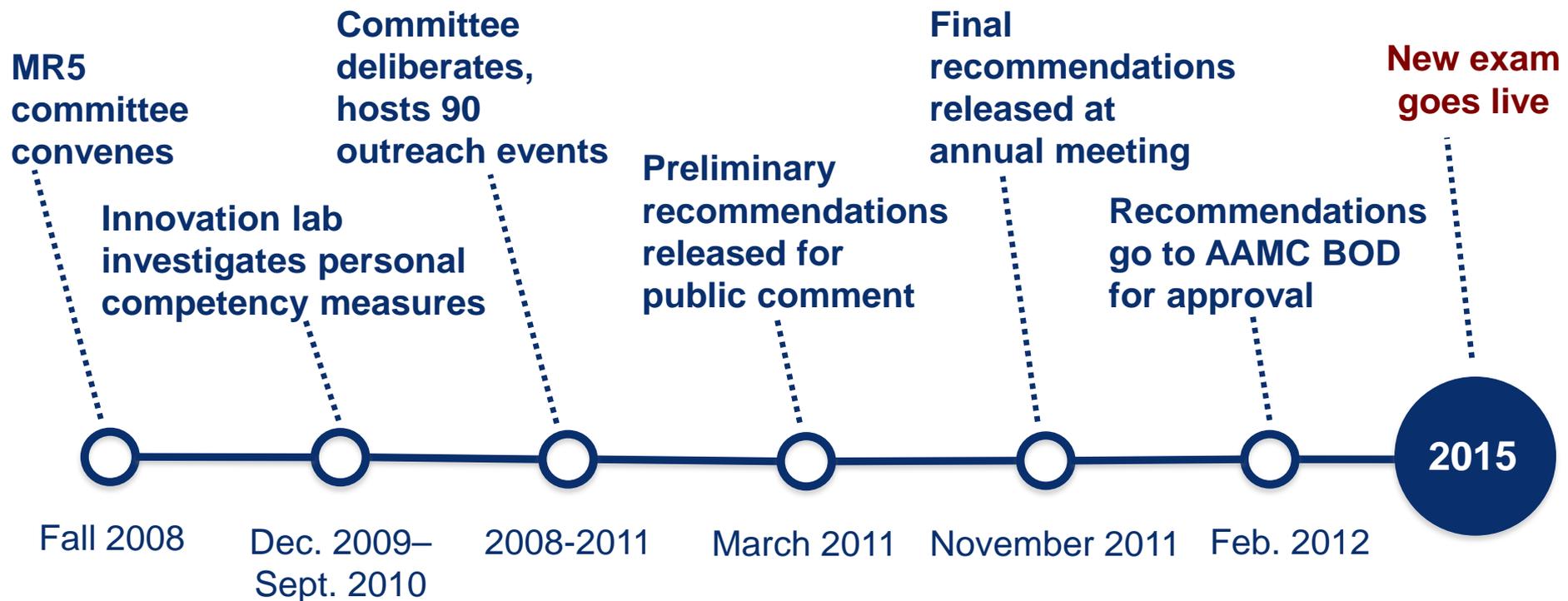


What are the next steps?

- Previewed the final recommendations with recipients of the MR5 e-newsletter last month
- Have just released a *Preview Guide* for the new exam, with detailed descriptions of the knowledge and skills the new exam will test, along with sample test questions
- AAMC's leadership will propose the future test to AAMC's Board of Directors in February



MR5 Timeline





What are our goals for the 2015 MCAT?

- Preserve what works best,
- Eliminate what doesn't, and
- Enrich the exam by giving attention to concepts that future physicians are likely to need—using a testing format that already has proven to be successful.





What else are we recommending?

- Resources that AAMC should provide to examinees, pre-health advisors, and admissions officers to help them prepare for the new exam
- Work that AAMC should do that goes beyond the exam to develop new measures of integrity, service orientation, and other personal characteristics that admissions committees can use early in student selection





What are our recommendations about the content and format of the new test?





Include 4 test sections and report 4 scores, including the:

- Biological and biochemical foundations of living systems
- Chemical and physical foundations of biological systems
- Psychological, social, and biological foundations of behavior
- Critical analysis and reasoning skills





Preserve what's best:

- Two natural science tests will be organized around concepts described by the SFFP committee as important to entering students' success
- Reflect medical school faculty's, residents', and students' ratings of the most important of these
- Will test examinees' knowledge and use of the highly-rated concepts in biology, general and organic chemistry, physics, biochemistry, cellular/molecular biology, research methods, and statistics





Preserve what's best:

- At many schools, students currently learn these concepts in introductory biology, general and organic chemistry, and physics, and in first-semester biochemistry courses
- Cellular/molecular biology concepts that will be tested are taught in most introductory biology sequences
- Research methods and statistics concepts that will be tested are foundational and described by undergraduate faculty as important to students' success in introductory science courses





Preserve what's best:

- Questions on the two exams will ask examinees to combine their knowledge of natural sciences concepts with their scientific inquiry, reasoning, research methods and statistics skills to solve problems that demonstrate readiness for medical school

	Natural Sciences Concepts
Scientific inquiry, reasoning, research methods, and statistics skills	Questions





Preserve what's best:

- Critical analysis and reasoning section will test examinees' reasoning by asking them to critically analyze, evaluate, and apply information provided by passages
- Encourage examinees to read broadly and in humanities and social sciences disciplines to familiarize themselves with the issues they raise
- Will include passages from ethics and philosophy, cross-cultural studies, population health, and a wide range of social sciences and humanities disciplines
- Questions won't require disciplinary knowledge--all needed information will appear in the passages





Eliminate what's not:

- Drop the Writing Sample section because:
 - Data show that most admissions committees use WS scores for relatively few applicants, and
 - Though WS scores and medical student outcomes have small positive correlations, WS has little incremental predictive value over UGPA and VR scores.





Enrich the exam:

- Psychological, social, and biological foundations of behavior section will test knowledge and use of concepts that provide a solid foundation for learning in medical school about the behavioral and socio-cultural determinants of health and health outcomes
- Organized around concepts described by the Behavioral and Social Sciences Foundations for Future Physicians Committee as important to medical students' success





Enrich the exam:

The new section will test:

- Ways in which psychological, social, and biological factors influence our perceptions and reactions to the world
- Behavior and behavior change
- What we think about ourselves and others
- Cultural and social differences that influence well-being
- Relationships between social stratification, access to resources, and well-being





Enrich the exam:

- At many schools, students currently learn these concepts in first-semester psychology and sociology (and in introductory biology)
- Questions will ask examinees to combine their knowledge of these concepts with their scientific inquiry, reasoning, research methods and statistics skills to solve problems that demonstrate readiness for medical school

	Social and Behavioral Sciences Concepts
Scientific inquiry, reasoning, research methods, and statistics skills	Questions





Additionally, we recommend:

- Introduce the new exam in 2015
- Report scores on a scale that's similar to the current 1-15 scale, rather than on a pass/ fail or other categorical scale
- Report scores with confidence bands around them so users are reminded of the error associated with applicants' scores
- Update the content that the exam tests on a regular schedule to ensure that MCAT keeps pace with the rapid changes in science



What are our recommendations about the resources AAMC should provide to examinees, pre-health faculty, and admissions committees for the new exam?





Resources for admission officers:

- Webinars, guides and other resources that clearly describe the new exam and the types of decisions test scores are and are not designed to support in a holistic review of applicants' qualifications
- A new Validity Studies Service to help medical schools track data and conduct research on the value and validity of the new exam for student selection at their schools





Resources for prospective examinees:

- *Preview Guide for MCAT²⁰¹⁵*
 - detailed descriptions for all 4 sections, including knowledge and skills tested
 - detailed topic lists
 - sample test questions
 - www.aamc.org/mcat2015/preview.pdf
- Videos describing MCAT²⁰¹⁵ and preparation
- Dedicated web site: www.aamc.org/mcat2015
- *The Official Guide to MCAT²⁰¹⁵* by 2014
- Free full-length practice test online by 2014



Financial support for examinees:

- Low-cost and free preparation materials
- Fee Assistance Program includes MCAT:
 - Reduced fee for MCAT
 - Free copy of *The Official Guide to MCAT*²⁰¹⁵
- Examinees with special needs have access to \$500 scholarships for the costs of evaluations that they need to apply for testing accommodations



Reaching ALL students:

- Special attention to the educational needs of students at under-resourced institutions:
 - Student organizations and fairs
 - ‘Boots-on-the-ground’ support from medical students, admissions staff, and diversity officers
 - Support to their advisors and faculty
- Continuing work on outreach strategies for educationally- and economically-disadvantaged students





Resources for advisors and other faculty:

- *Preview Guide for MCAT²⁰¹⁵* – detailed explanations of concepts, topic lists, and sample questions
- Advisor section of web site:
www.aamc.org/mcat2015
- Webinars and conference presentations
- Complimentary copies of *The Official Guide to MCAT²⁰¹⁵*
- Discounts on bulk orders of preparation materials, including practice tests for MCAT²⁰¹⁵



Resources for advisors and other faculty:

- PreHealthCollaborative curriculum-sharing project to encourage innovation
 - Online repository of instructional modules for concepts that entering medical students need to know
 - Cataloged by concept
 - User comments feature to support use
 - Makes it easier to adopt innovative content and methods in existing courses





Resources for advisors and other faculty:

- Special attention to under-resourced institutions through:
 - Direct outreach, especially to advisors and faculty at minority-serving schools
 - Conferences and professional organizations
 - ‘Boots-on-the-ground’ support from medical students, admissions staff, and diversity officers



What are our recommendations for helping medical schools consider data on integrity, service orientation, and other personal characteristics early in student selection?





Go beyond the MCAT exam to:

Investigate options for gathering data about personal characteristics through:

- A new section of the AMCAS application that asks applicants to reflect on experiences that demonstrate their personal characteristics, and
- Standardized letters that ask recommenders to rate and write about behaviors that demonstrate applicants' personal and academic characteristics.





Go beyond the MCAT exam to:

- Mount a rigorous program of research on the extent to which applicants' personal characteristics might be measured:
 - As part of a separate regional or national event, or
 - Locally by admissions committees using nationally-developed tools.
- We'll hear more about these recommendations next.



What are the reasons for our recommendations?





What are the reasons for our recommendations?

- Using a testing format that has proven successful, our recommendations preserve what works, eliminate what isn't working and, by attending to concepts that future physicians are likely to need, further enrich the exam.
- They balance testing between the natural sciences, the social and behavioral sciences, and critical analysis and reasoning.
- They respond to the SFFP and BSSFFP recommendations and reflect current science.





What are the reasons for our recommendations?

- They ask examinees to demonstrate their knowledge of the natural, social, and behavioral sciences by solving problems that call for scientific thinking, research, and statistics skills.
- They communicate the need for students who are prepared to deal with the human and social issues of medicine, and they stress the necessity of reading broadly to prepare for medical school.



Questions?



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Includes 4 test sections and reports 4 scores:

- Section scores will have greater accuracy and be more interpretable than current section scores
- Sections will include more test questions and be longer than the current sections
- This will lengthen the testing day from about the current 5½ hours to about 7½ hours (with time for administrative issues, breaks, and lunch)





Includes 4 test sections and reports 4 scores:

- New biochemistry, psychology, and sociology content will call for additional study
- At many schools, students currently learn these concepts in first-semester biochemistry, psychology, and sociology courses
- Without information about the new test, a quarter of current applicants take all three of these courses, 40% take two, 30% take one, and 5% take none





What are the next implementation steps?

- Refine blueprints for item writing and test construction
- Conduct small-scale studies of possible group differences on new content
- Field test new content in 2013 and 2014
- Stop administering the Writing Sample in 2013 and use the last hour of the operational test to collect field-test data from examinees who volunteer



Frequently Asked Questions (FAQs) About Fairness and Bias

1. Is the MCAT fair and unbiased?

Yes. AAMC follows rigorous test development and validation procedures to insure that the MCAT is not biased.

First, every item on the MCAT is reviewed to ensure that it does not contain content or language that would be offensive to some groups or that would have different meaning in different cultures.

Second, item statistics are examined for every operational MCAT item to ensure that it functions as intended for various groups.

Third, research studies are conducted to verify that MCAT scores do not underestimate the subsequent medical school performance of students from racial/ethnic minority groups.

2. Do members of some groups score lower on the MCAT than others?

Yes. Average (mean) scores of White and Asian test-takers are higher than those for Black, Hispanic, and Native American test-takers.

(in standard deviation terms, the White-Black difference is 1.05 SD, the White-Hispanic difference is .78, the White-Asian difference is .03, and White-Native American difference is .052. The MCAT total score standard deviation is 6.4, so, for example, the White-Black difference is about 6.7 points on a scale ranging from 3 to 45.)

It's important to note that test-takers from all groups exhibit the full range of scores, from very high to very low. A difference in average scores does not mean that all members of one group obtain high scores or that all members of the other group obtain low scores.

Frequently Asked Questions (FAQs) About Fairness and Bias

3. Doesn't a finding of differences in mean scores indicate that the MCAT is biased?

No. As professional testing standards note, mean differences alone don't permit a judgment as to whether a test is or is not biased.

For example, a test of empathy that results in higher mean scores for women than men might mean the test is biased, or it might accurately indicate that in this group of test takers women really are, on average, more empathetic.

Thus when we observe mean differences, we need to examine whether test scores accurately describe test-takers' current level of the characteristic being assessed. The AAMC conducts extensive research to ensure that the MCAT measures the skills of interest, rather than is not biased (see FAQ #1 above).

4. Does the MCAT show larger group mean group differences than other admissions tests?

No. Differences on the MCAT parallel those on undergraduate, graduate, and professional school admissions tests. Thus there is nothing unique about the MCAT in this regard.



Frequently Asked Questions (FAQs) About Fairness and Bias

5. What is the cause of the mean differences on the MCAT?

Research has identified a large number of risk factors linked to lower academic achievement. Exposure to many of these risk factors is higher for Black and Hispanic students than for White students. While this research is on broad samples of the population, rather than on medical school applicants, we believe it offers important insights.

These include risk factors in various categories, including:

Family (e.g., lack of parental participation at school; frequency of moving and changing schools)

Environmental (e.g., lead exposure in early childhood)

Neighborhood (e.g., living in high poverty neighborhoods)

School (e.g., changing teachers in mid-year; fear and safety concerns at school)

Thus we do not believe that there is one single determinant of the mean difference in MCAT scores across groups. Rather, many factors contribute, and it is likely that we have yet to identify the full set of factors.

6. Does stereotype threat bias scores on the MCAT?

Many laboratory research studies show that making race or gender salient to test-takers can affect the test performance of members of stereotyped groups.

However, there is very little research examining stereotype threat in operational high-stakes testing settings. Research in such settings often does not find evidence of threat effects.

We do not see evidence of systematic stereotype threat effects on the MCAT. If scores of stereotyped group members are lowered due to threat, then MCAT should underestimate the subsequent medical school performance of students from these stereotyped groups. However, as noted in FAQ#1, MCAT research does not find such underestimation.



Frequently Asked Questions (FAQs) About Fairness and Bias

7. Since there are mean differences between groups on the MCAT, why not drop the MCAT and rely on college grades instead?

College grades show mean differences between groups similar to the differences on the MCAT. So replacing MCAT with grades would not be a way to eliminate group differences.

Medical schools do indeed give considerable attention to grades, in addition to MCAT scores and other factors. It is a misconception that MCAT scores alone drive admissions decisions.

Grade point average reflects differing patterns of course-taking across students, different levels of course difficulty across institutions, and differences in instructor grading standards. In contrast, the MCAT offers a common basis for comparison across all applicants.

8. Do mean differences serve as a barrier to admission for groups with lower mean scores?

No. Medical school admission relies on a holistic integration of multiple factors, not just the MCAT, and admission rates are similar across groups.

(detail: proportions admitted by group are White: 46%; Black: 39%; Hispanic: 46%; Asian: 42%; Native American: 44%.)

If the MCAT were used alone as the sole basis for admissions, it would indeed be a barrier. For example, we estimate that the Black acceptance rate would be less than half of the current rate (16% instead of 39%) if the MCAT were used alone.



Frequently Asked Questions (FAQs) About Fairness and Bias

9. Would using a pass-fail system increase minority admissions?

Probably not. Schools have flexibility in how they use MCAT score information, and with holistic review, strengths in other areas may lead an admissions committee to accept an applicant with a lower MCAT score. A rigid pass-fail score would prevent this consideration of lower-scoring applicants.

10. Will mean differences across groups change on the new MCAT?

The new MCAT drops one subtest (Writing), adds a new subtest (Behavioral and Social Sciences), and modifies the Verbal Reasoning and the two Science subtests. Given this multitude of changes, we cannot determine whether mean differences will be affected until the new test is administered.

We are planning extensive series of evaluation studies as we roll out the new MCAT, and examining mean differences across groups is an important piece of this work.

Our best estimate, though, is that mean differences will not be markedly different on the new MCAT.

