

Selecting Tomorrow's Physicians: The Key to the Future Health Care Workforce

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Abstract

Recent U.S. health care reform efforts have focused on three main goals: improving health care for individuals, improving population health, and lowering costs. Physicians, who traditionally have practiced with considerable autonomy, will be required to become members of the team-based patient care models necessary to achieve these goals. In this perspective, the authors assert that medical school admissions, the selection of the future physician workforce, is a key component of health care reform.

They review the historical context for medical school admission processes, which have placed a premium on grades and standardized test scores, and examine how admission practices are undergoing fundamental changes in order to select physicians with both the academic and interpersonal and intrapersonal competencies necessary to operate in the health care system of the future. The authors describe how new techniques, such as holistic review and multiple mini-interviews, are contributing to the shift

toward competency-based medical education. Innovations underway at the Association of American Medical Colleges to transform medical school admissions also are explored. The authors conclude by arguing that although the admission process has great potential to transform the future health care workforce, major overhauls of the health care payment and delivery systems must be achieved alongside innovations in health professions education to truly transform the U.S. health care system.

Recent health care reform efforts in the United States have focused on the “triple aim”¹ of improving health care for individuals, improving population health, and lowering costs. Physicians, who traditionally have practiced with considerable autonomy, will be required to become members of the team-based patient care models that are necessary to achieve these goals. Yet, little scholarly attention has been paid to how the medical school admission process should adapt to identify individuals well suited for collaborative, team-based practice. In this perspective, we propose that changing how medical schools evaluate applicants can help to create the kind of

physicians needed for the future health care workforce. We start with an overview of the history of the medical school admission process and then examine initiatives and innovations currently underway that aim to transform the admission process into one that emphasizes competencies and embraces holistic review.

Medical School Admissions: A Historical Legacy

The recent centennial of Abraham Flexner’s famous 1910 report on the state of American medical education has spurred much reflection within the academic medicine community. This introspection includes a reassessment of how medical school admission practices have changed across the decades.² When Flexner traveled across North America in the early 20th century, he decried the lack of rigor in premedical education requirements and medical school admission processes, describing the proliferation of substandard medical schools in the United States as “the fertile source of unforeseen harm to medical education and to medical practice.”³ The Flexner Report provided national exposure for concerns previously voiced by other stakeholders.

advocated that medical schools build on that foundation with a strong clinical education program by providing learning experiences in patient care settings.³ For more than 80 years, the Medical College Admission Test, or MCAT exam, has been an integral component of the medical school admission process. The MCAT exam has become the tool of choice not only to measure medical school applicants’ mastery of scientific content, in conjunction with their grade point averages, but also to act as a reliable predictor of success in medical school and initial licensure examinations.⁵

There long has existed a clear need to assess applicants beyond their grades and MCAT scores. By the early 1980s, live interviews emerged as a tool to help admissions officers get to know an applicant as a person and not merely as a scholar.⁶ Although recent innovations, as we will discuss below, are showing great promise to strengthen the interview as a screening tool,⁷ interviews traditionally have been a relatively weak, subjective, and inconsistent means by which to assess medical school applicants.⁸

Selecting the Future Physician Workforce: A Key to Health Care Reform

Although the admission system created in response to Flexner’s findings has been successful in ensuring that 20th- and

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21st-century physicians are grounded in the natural and traditional life sciences, it has fallen short in identifying the innovative physicians who can transform the health care system. The inescapable truth is that medical students and residents currently are receiving their clinical training in a health care system that many scholars have referred to as dysfunctional and not providing sufficient value.¹

The United States has the highest health care spending when compared with similar developed nations, yet it has poor outcomes on numerous measures, including life expectancy, infant mortality, and obesity.⁹ Though the national health expenditure growth rate has slowed in recent years, some of this slowdown likely is attributable to the recession and patients choosing to cut back on health care services.^{10,11}

In addition to high costs and poor outcomes, the United States suffers from pernicious health disparities along the lines of race, ethnicity, and geographic location.¹² Disparities in health status and outcomes stem in large part from social determinants of health, which include socioeconomic status, education level, access to healthy food and produce, and environmental factors like pollution.¹³ Educating and training a diverse, culturally competent health care workforce that is well equipped to understand and address social determinants of health is essential to improving health care quality.¹⁴

In February 2013, more than 100 leaders of medical schools and teaching hospitals convened at a summit hosted by the Association of American Medical Colleges (AAMC) to address the unsustainability of current health care costs. A consensus emerged that creating a truly high-value health system will require more than revenue expansion and expense reduction; it will entail a true redesign.¹⁵ The conclusions of the summit echo the literature.^{16,17} In the face of such daunting challenges, it is no longer sufficient to select and train future physicians in medicine alone. Physicians must have the capacity to engage in systems-based thinking and work in teams to lead positive change in the nation's health care system.

Rethinking Medical School Admissions: A Confluence of Factors

Several major factors have converged to influence thinking about medical school admissions. While the academic medicine community was engaging in conversation regarding medical education stimulated by the Flexner Report centennial, the national debate surrounding health care reform—which ultimately resulted in the passage of the Patient Protection and Affordable Care Act—was beginning in earnest. At the same time, issues regarding professionalism and the definition of what constitutes a “good doctor” came to the fore.¹⁸

In this confluence of factors, the AAMC recognized an opportunity to consider a broader transformation of the medical school admissions process beyond its regularly scheduled review of the MCAT exam.¹⁹ The association launched its Admissions Initiative (AI), aimed at transforming the way in which medical school applicants are assessed and selected in order to identify those who will become the kinds of physicians best suited to practice in a dynamic health care environment. Specifically, the AI is designed to support the implementation of holistic admissions, explore ways to ease the transition to competency-based learning and assessment in undergraduate medical education, and examine new and better ways to measure core, entry-level competencies for medical students.²⁰ There was increased recognition at the AAMC and nationally that the admission system that had served medical schools well for the past century could be improved to identify those future physicians with both a strong foundation in the natural sciences and a “good bedside manner,” that is, a high degree of professionalism, well-honed communication skills, and an ability to interact with and understand their future patients.^{21–23}

Supporting Holistic Admissions

Holistic admissions, an integral component of the AI, refers to a “flexible, highly individualized process by which balanced consideration is given to the multiple ways in which applicants may prepare for and succeed as medical students and doctors.”²⁴ This process complies with the U.S. Supreme

Court’s “holistic review” rubric, which was established in 2003 by *Grutter v. Bollinger*, and calls for an individualized review of each applicant that considers how that applicant might contribute to a diverse educational environment. Evaluation criteria for a holistic review process must be mission driven, broad based, institution-specific, and applied across the applicant pool consistently.²⁵ Holistic review has three goals: to assess applicants’ academic readiness for medical school, to identify and assess applicants’ interpersonal and intrapersonal competencies, and to encourage diversity in medical education.

Redefining academic readiness

The first goal of holistic review is to identify students who are academically qualified to succeed in medical school. The shift to competency-based medical education is leading to a parallel shift toward competency-based admission.

To define medical education competencies, two working groups identified the skills and knowledge that future physicians should possess on entry to or completion of medical school. Issued in 2009, “Scientific Foundations for Future Physicians” recognizes that a strong background in the basic and natural sciences is critical to success in medical school and defines the scientific competencies that future medical school graduates should possess.²¹ The companion report, “Behavioral and Social Science Foundations for Future Physicians,” finds that concepts from the behavioral and social sciences are equally important; they serve to prepare medical school graduates for comprehensive, patient-centered practice and provide the conceptual framework needed to address complex societal problems that have direct bearing on health and health care disparities.²⁶ Taken together, these reports seek to encourage innovation in the design of premedical and medical curricula by outlining general competencies required to be successful in today’s health care environment, rather than prescribing a set list of courses.

More recently, the AAMC and five other health associations representing schools of osteopathic medicine, dentistry, nursing, pharmacy, and public health jointly created the Interprofessional Education Collaborative (IPEC).

This group initially defined four interprofessional competencies that health professions students should acquire over the course of their training: values and ethics, understanding roles and responsibilities, interprofessional communication, and teamwork. The result of IPEC's efforts, "Core Competencies for Interprofessional Collaborative Practice," represents the first time consensus has been reached about competencies required for team-based practice in a variety of settings, including in the clinic and at the bedside.²⁷ IPEC hopes that promoting a common language and shared competencies will contribute to the development of resources for substantive interprofessional learning and, ultimately, true team-based care delivery.

One of the most substantial ways the AAMC hopes to support the creation of a future-oriented physician workforce is through its redesign of the MCAT exam. In recognition of the MCAT exam's status as an important tool for medical student selection,² the fifth MCAT review (MR5) committee recommended, and the AAMC Board of Directors approved in February 2012, revisions to the MCAT exam beginning in 2015.^{19,28–30} One of the most prominent changes is that the 2015 exam will add a section that tests knowledge of concepts from the behavioral and social sciences to complement testing in the basic and natural sciences.³¹ The MR5 committee recognized that, while future physicians undoubtedly will require basic and natural science knowledge, they also will need to be able to understand their patients—how they think, interact, and make decisions. An understanding of behavior, perception, culture, poverty, and other concepts from psychology and sociology included on the new MCAT exam contributes to the creation of the "good doctor."³²

The 2015 MCAT exam also adds a "Critical Analysis and Reasoning Skills" section, which is designed to help medical schools assess how applicants reason.²⁹ Thanks to advances in technology and innovation, the scientific knowledge available to today's physicians far surpasses the human brain's capacity to retain every fact.³³ The new MCAT section reflects the understanding that, in today's environment of big data, students' ability to seek and reason through information is more important than their capacity for rote memorization.

Identifying and assessing interpersonal and intrapersonal competencies

Holistic review's second goal is to identify applicants who possess the traits, experiences, and attributes that will lead them to become well-rounded physicians. In 2013, the AAMC identified the most desirable interpersonal and intrapersonal competencies for entering medical students^{34,35} (see Table 1). The process used to identify the traits most associated with success in medical school, residency, and eventual practice was rigorous, involving multiple rounds of data collection and input from numerous sources, including medical school professionals representing admissions, academic affairs, student affairs, and multicultural affairs departments. A small group of stakeholders, called the Innovation Lab Working Group, reviewed the literature and data and collected feedback from members of the academic medicine community at outreach events and from various advisory groups.³⁶ The result is a set of competencies that represents medical schools' expectations for entering students—traits such as service orientation, cultural competence, and reliability and dependability. These clearly align with the competencies for residents, as defined by the Accreditation Council for Graduate Medical Education.³⁷

It is not enough simply to identify desired competencies for entering medical students, however. To transform their admission processes, medical schools must have a reliable method by which to assess applicants' level of competency in each area. To support medical schools in this endeavor, the AAMC is making several changes. In April 2013, the association issued standardized guidelines to aid writers of letters of recommendation. These new guidelines recommend that evaluators assess rather than advocate for the applicant's suitability for medical school, and focus on specific observed behaviors and their consequences when writing letters of recommendations.³⁸

Additionally, the AAMC is considering two other methods to help medical school admission committees assess students' interpersonal and intrapersonal competencies. The first is a potential revision to the American Medical College Application Service (AMCAS) to include

a "Reflections on Interpersonal and Intrapersonal Competencies" section, where applicants would be prompted to reflect on experiences in which they have demonstrated some or all of these competencies. For each experience, applicants would be asked to describe the situation in which it took place, the actions they took, the consequences of their actions, and what they learned. Secondly, the AAMC is exploring the development of a situational judgment test (SJT) as another tool to probe applicants' interpersonal and intrapersonal competencies.³⁹ SJTs, which "confront applicants with written or video-based scenarios and ask them to indicate how they would react by choosing an alternative from a list of responses," have shown great promise in identifying interpersonal skills.⁴⁰ Although enhanced letters of recommendation and autobiographical presentations of personal experiences may not perfectly assess the competencies of an applicant, their increasing value to admissions officers reflects the importance of open-ended assessment formats.²

As mentioned earlier, new interview techniques are emerging to allow medical schools to probe better dimensions of applicants' competencies, ranging from how applicants respond to novel situations to their reactions to an ethical conflict. The multiple mini-interview (MMI) was pioneered by the Michael DeGroote School of Medicine at McMaster University and is now employed by the majority of Canadian medical schools and more than 22 U.S. medical schools.^{7,39} In another approach, some schools leverage students from their drama departments to serve as patient-actors in mock interviews in order to assess applicants' interpersonal skills.⁴¹ The University of Sydney, which has been conducting MMIs for admission to its medical and dental programs since 2005, now conducts these interviews via Skype. Their research shows the MMI is the strongest predictor of student performance in professional and clinical-type exams.⁴²

Supporting diversity in medical education

The third and final goal of holistic review is to support diversity in medical education. At a time when the U.S. population is growing and aging, it also is becoming increasingly

Table 1
Desired Personal Competencies for Entering Medical Students*

Competency type	Key demonstrable skills
Interpersonal competencies	
Service orientation	<ul style="list-style-type: none"> • Demonstrates a desire to help others and sensitivity to others' needs and feelings • Demonstrates a desire to alleviate others' distress • Recognizes and acts on his or her responsibilities to society, locally, nationally, and globally
Social skills	<ul style="list-style-type: none"> • Demonstrates an awareness of others' needs, goals, feelings, and the ways that social and behavioral cues affect peoples' interactions and behaviors • Adjusts behaviors appropriately in response to these cues • Treats others with respect
Cultural competence	<ul style="list-style-type: none"> • Demonstrates knowledge of social and cultural factors that affect interactions and behaviors • Shows an appreciation and respect for multiple dimensions of diversity • Recognizes and acts on the obligation to inform one's own judgment • Engages diverse and competing perspectives as a resource for learning, citizenship, and work • Recognizes and appropriately addresses bias in self and others • Interacts effectively with people from diverse backgrounds
Teamwork	<ul style="list-style-type: none"> • Works collaboratively with others to achieve shared goals • Shares information and knowledge with others and provides feedback • Puts team goals ahead of individual goals
Oral communication	<ul style="list-style-type: none"> • Effectively conveys information to others using spoken words and sentences • Listens effectively • Recognizes potential communication barriers and adjusts approach or clarifies information as needed
Intrapersonal competencies	
Ethical responsibility to self and others	<ul style="list-style-type: none"> • Behaves in an honest manner • Cultivates personal and academic integrity • Adheres to principles • Follows rules and procedures • Resists peer pressure to engage in unethical behavior and encourages others to behave in honest and ethical ways • Develops and demonstrates ethical and moral reasoning
Reliability and dependability	<ul style="list-style-type: none"> • Consistently fulfills obligations in a timely and satisfactory manner • Takes responsibility for personal actions and performance
Resilience and adaptability	<ul style="list-style-type: none"> • Demonstrates tolerance of stressful or changing environments or situations and adapts effectively to them • Shows persistence, even under difficult situations • Recovers from setbacks
Capacity for improvement	<ul style="list-style-type: none"> • Sets goals for continuous improvement and for learning new concepts and skills • Engages in reflective practice for improvement • Solicits and responds appropriately to feedback
Thinking and reasoning competencies	
Critical thinking	<ul style="list-style-type: none"> • Uses logic and reasoning to identify the strengths and weaknesses of multiple solutions, conclusions, or approaches to problems
Quantitative reasoning	<ul style="list-style-type: none"> • Uses data and mathematics to describe or explain phenomena in the natural world
Scientific inquiry	<ul style="list-style-type: none"> • Applies knowledge of the scientific process to integrate and synthesize information, solve problems, and formulate research questions and hypotheses • Is facile in the language of the sciences and uses it to participate in the discourse of science and explain how scientific knowledge is discovered and validated
Written communication	<ul style="list-style-type: none"> • Effectively conveys information to others using written words and sentences
Science competencies	
Living systems	<ul style="list-style-type: none"> • Applies knowledge and skill in the natural sciences to solve problems related to molecular and macro systems including biomolecules, molecules, cells, and organs • Applies knowledge of complex living organisms including how they transport materials, sense their environment, process signals, and respond to changes and chemical interactions/reactions
Human behavior	<ul style="list-style-type: none"> • Applies knowledge of the self, others, and social systems to solve problems related to the psychological, social-cultural, and biological factors that influence health and well-being, behavior, and how we think about ourselves and others • Applies knowledge of cultural and social differences as well as social stratification and access to resources

*Adapted from Association of American Medical Colleges³⁴ and Koenig et al.³⁵

diverse. This change will require that tomorrow's physicians possess a high degree of cultural competence, which has been defined as "a set of congruent behaviors, knowledge, attitudes, and policies that come together in a system, organization, or among professionals that enables effective work in cross-cultural situations."⁴³ There are numerous, well-documented benefits to educating medical students alongside classmates and other health professions students that represent diversity in all its forms: socioeconomic status, primary language, nationality, sex, gender identity, sexual orientation, religion, geographic background, physical ability, age, racial identity, and ethnicity. Page⁴⁴ has shown that diverse groups of people from varied backgrounds do better at problem solving and, in many ways, are smarter than any individual. Further evidence shows that "students in medical schools value diversity in their classmates and find both the academic experiences and their abilities to work with patients from differing backgrounds enhanced by this diversity."⁴⁵

Holistic review allows medical schools to achieve diverse student bodies in accordance with current legal precedent. In its 2003 decision in *Grutter v. Bollinger*, the U.S. Supreme Court recognized that "student body diversity promotes learning outcomes, better prepares students for an increasingly diverse workforce and society, and better prepares them as professionals."⁴⁶ The AAMC is pleased that the Supreme Court continues to recognize the educational benefits of diversity and the appropriateness of individualized, holistic review in admissions, as evinced by its recent ruling in *Fisher v. University of Texas at Austin*.⁴⁷

Taking a Lesson From History: Admissions for the Coming Century

A century ago, the academic medicine community concluded that providing physicians with a rich scientific background, verified through the use of standardized tests, was the definitive answer to addressing the problems revealed by the Flexner Report. As the last 100 years have demonstrated, however, changing circumstances in the health care landscape necessitate constant transformation. Medical schools would

do well to take a lesson from history and not assume that current innovations in medical school admission will be sufficient to ensure a physician workforce that is adaptable to a changing health care system. The innovations taking place on campuses across the nation will need to be subjected to rigorous research to validate their continued use. Medical schools need to be prepared to rethink admission processes and desired competencies continually.

The interprofessional collaboration exhibited by IPEC's formation and work provides a foundation for the various health professions to learn from one another. Many health professions have acknowledged that the shared vision of truly patient-centered, team-based care must be fostered from the earliest stages of training, before professional identity is set. Ideally, this collaboration would encompass sharing best practices in the selection of tomorrow's doctors, nurses, dentists, pharmacists, and public health and allied health professionals.

Though a redesigned medical school admission process has great potential to transform the future health care workforce, it is not a panacea for all of the ills facing the U.S. health care system. Major overhauls of the health care payment and delivery systems must be achieved alongside innovations in health professions education. The positive news is that medical schools and their affiliated teaching hospitals are at the forefront of current health system transformation efforts. Academic medical centers affiliated with AAMC-member medical schools are well represented in new programs supported by the Centers for Medicare and Medicaid Services, such as the Health Care Innovation Awards, the Innovation Advisors Program, Pioneer Accountable Care Organizations, and the Medicare Shared Saving Program. This commitment to innovation—in domains ranging from medical school admissions to interprofessional education and care to health care payment and delivery systems—indicates not only that medical schools and teaching hospitals are willing to address the nation's real health care problems but also that they are making real progress toward achieving that goal.

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