

Practicing Holistic Review in Medical Education

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Executive Summary

Holistic review is a conceptual framework that encourages medical schools to consider a wide range of criteria in deciding which applicants to admit. It promotes a balanced approach to the admissions process, taking into account both the need to admit students whose Medical College Admissions Test (MCAT) scores and undergraduate grade point average (GPA) indicate they will perform well in the foundational science curriculum, with a desire to admit students whose personal attributes and life experiences are aligned with the school's institutional mission. Initially conceived of as a way for institutions to legally pursue more racially and ethnically diverse cohorts of students, its principles support a broad conception of diversity, including sexual and gender identity, disability status, and other features of individuals' lived experience.

Holistic review in the admissions process is used by medical schools, not only to provide medical students and faculty the benefits of a diverse learning environment, but also to address the challenges of disparate population health outcomes and uneven access to care. Holistic review has its origins in the student admissions process, but the concept has implications for the broader culture of medical education, including student affairs, graduate medical education (GME), and faculty hiring and advancement. This issue brief summarizes key topics as described in the current literature on the use of holistic review in medical education, as well as findings from a series of interviews with recognized leaders in the field who shared their experiences with implementing holistic review initiatives.

Although medical schools consider applicant criteria other than MCAT scores and undergraduate GPA, key informants distinguished this practice from a formal and systematic holistic review process. The foundation of holistic review is an institution's mission and educational goals, which serve as the focal point for the various criteria used to both recruit and evaluate applicants, and foster a shared understanding of the rationale and goals of holistic review among the broader medical school culture and the community it serves. A critical element of holistic review is transparency in the process. Key informants emphasized that expectations for the types of experiences and specific personal attributes valued by the program, and how they reflect the institutional mission, are made explicit to all applicants. Moreover, the stated objectives of holistic review must be linked with measurable outcomes and subject to rigorous evaluation, thus providing an evidence base that can be used to validate assumptions, understand what components are effective and identify persistent challenges, and communicate findings with institutional and community stakeholders.

MCAT scores and undergraduate GPA are reliable indicators of whether or not an applicant is likely to succeed academically in medical school. They are also critical factors in determining which applicants are invited for admission interviews. However, these academic metrics may unduly influence admissions committee members throughout the process. Key informants highlighted the practice of blinding the admissions process to academic metrics, once it has been determined that an applicant's MCAT score and GPA indicate a likelihood of academic success. This allows admissions committees to focus exclusively on the attributes and experiences aligned with the institutional mission.

Evaluating subjective information during the admissions process in a manner that is fair and produces valid and reliable results is challenging. Key informants stressed the importance of utilizing a systematic process for doing so and applying it consistently. Several key informants reported that their institutions use the Multiple Mini-Interview (MMI) format for conducting applicant interviews. The MMI has been shown to reduce the effect of subjective bias compared with a traditional interview format. By design, the MMI requires a large number of individuals to participate, given the number of interviews conducted with each applicant. Key informants viewed this requirement as an opportunity to invite diversity into the process by engaging people with different experiences and perspectives, including non-physician healthcare providers, health professions graduate students from fields other than medicine, and stakeholders from the community.

A Situational Judgement Test (SJT) is a method of measuring the implicit social-behavioral traits associated with an individual's judgement. SJTs have been used by professional organizations in the context of personnel selection for decades and have been shown to be reliable, valid, and accurate. Currently, SJTs are utilized as a selection tool for medical education and training, and other healthcare fields, in the United Kingdom, Canada, and Australia, among other countries. The Association of American Medical Colleges (AAMC) has developed a SJT for use by US medical schools focusing on eight core competencies: *Service Orientation, Social Skills, Cultural Competence, Teamwork, Ethical Responsibility to Self and Others, Reliability and Dependability, Resilience and Adaptability, and Capacity for Improvement*. The SJT will enhance holistic review by providing admissions

committees a reliable assessment of these pre-professional competencies. The AAMC is in the process of a multi-stage evaluation of the SJT and will pilot it for the 2021 application cycle. Goals of the pilot include an understanding of how to optimize both the administration of the SJT and its integration into the admissions process.

Another method of assessment that may be complementary to holistic admissions is the use of a composite measure of socioeconomic disadvantage (SED). An applicant's SED score can be used to adjust academic metrics to account for a range of factors that put the applicant at a disadvantage, such as limited access to high quality early childhood education, attendance at low performing primary and secondary schools, or a general lack of resources or exposure to opportunities that would benefit someone applying to medical school. This approach, although not yet widely used in practice, has proven viable as a concept. In simulations using real-world applicant data, the model demonstrated an ability to produce a diverse pool of qualified applicants without compromising the need to admit students who can succeed academically.

Key informants stressed the importance of evaluating both short and long-term outcomes, as not only a means of measuring progress, but also as a way to validate the assumptions that underlie any holistic review process. This is particularly important in the context of longitudinal outcomes. A core value proposition of the holistic review framework is its potential to transform the workforce in ways that ameliorate long-standing and persistent disparities in health outcomes and access to the healthcare system. Key informants acknowledged that not enough is known about what medical school graduates do beyond residency; how and where they practice, what patient populations they serve, or their engagement with other community health-related activities outside of professional, clinical practice. It is critical that these data are collected in order to evaluate holistic review practices in terms of their ability to effect change within the physician workforce and broader healthcare system.

The conceptual framework of holistic review is expanding beyond medical school admissions. Its principles are being applied to medical school student affairs, applicant selection for residency programs, and the recruitment and advancement of medical school faculty and senior administration. Key informants reported that their programs are focused on ensuring that the expectations students have developed as a result of the institutional messaging around holistic admissions and its promotion of diversity and inclusion is consistent with the lived experience of medical education. This translates into concrete actions such as the development of risk models that help anticipate students' need for supportive resources and coordinating the efforts of the different functional areas of student affairs to make certain those needs are met. A pilot program at the University of Texas Health Science Center at Houston demonstrated that a holistic review-based residency selection process that reduces the emphasis of Step 1 scores in favor of consensus-based, mission-aligned applicant criteria can lead to a more diverse cohort of residents without incurring significant risk to the program's board exam pass rates. The Baylor College of Medicine is currently using a holistic review-based framework for new and ongoing medical faculty searches, and is piloting a program in which select departments will use the framework in the faculty advancement process. It is important to acknowledge that the use of holistic review in student affairs, applicant selection for residency programs, and the hiring and advancement of medical school faculty and senior administration is a newer development; there is not yet consensus on what represents best practices (nor much research on these subjects). Nonetheless, the application of holistic review in these contexts has enormous potential to transform the culture of medical education and healthcare generally.

Introduction

The concept of holistic review promotes the idea that academic metrics have too much influence in the medical school admissions process, and that addressing the current challenges facing the US healthcare system requires consideration of a broader set of applicant criteria in order to produce a physician workforce that can meet those challenges. Persistent health disparities related to chronic disease, life expectancy, infant mortality, and a raft of other indicators of health and wellness (or the lack thereof) disproportionately affect minority, rural, and socioeconomically distressed populations in the US.¹ Lifestyle and behavioral factors contribute to these outcomes, but limited access to health services and a skilled healthcare workforce is also a critical factor, particularly in rural geographies.²⁻⁵ Medical schools throughout the US are utilizing holistic review in the admissions process, not only for the many benefits an educational environment where a diversity of views and experiences are present,⁶ but to address these related challenges of population health disparities and uneven access to care.

Reducing disparity in health outcomes and improving access to care occurs through two principle mechanisms: salutary changes in patient behavior resulting from a concordant physician-patient relationship, and access to a skilled healthcare workforce. The AAMC notes, “When health care providers have life experience that more closely matches the experiences of their patients, patients tend to be more satisfied with their care and to adhere to medical advice. This effect has been seen in studies addressing racial, ethnic, and sexual minority communities when the demographics of health care providers reflect those of underserved populations.”⁷ Studies also show that minority physicians are more likely to practice in underserved areas and care for low-income populations.⁸ There is also evidence that medical students who have a rural background are more likely to practice in a rural setting.⁹⁻¹² Moreover, holistic review processes lead to a more diverse pool of candidates for admission,¹³⁻¹⁴ thus increasing the likelihood of admitting students who will, ultimately, serve populations and geographic areas in need, and whose life experiences will contribute to improved physician-patient relationships.

The holistic review framework stems from the 1978 Supreme Court case, *Regents of the University of California v. Bakke*, which decided that the University of California, Davis medical school’s use of an affirmative action-based admissions policy reserving spots for underrepresented minority (URM) students was unconstitutional. In that decision, however, the Court’s majority opinion acknowledged the educational benefits of diversity. It held that “narrowly tailored” race-conscious admissions policies would be constitutional if race or ethnicity was but one of a number of factors considered.¹⁵ Despite multiple legal challenges, this precedent has been affirmed by rulings in subsequent court cases¹⁶ dealing with the consideration of race and ethnicity in the context of student admissions or enrollment policies.

The idea that students’ lived experience (including their demographic characteristics and geographic backgrounds) may be an asset to the broader community of medical education is at the core of the holistic review framework advanced by the AAMC through its Holistic Review Project.¹⁷ The initiative was conceived as a means of helping medical schools achieve more racially and ethnically diverse cohorts of students within the legal framework established by the landmark Supreme Court case (and subsequent court decisions), and by state laws prohibiting race-conscious admissions policies.¹⁸ It sought to provide definition and structure to a concept that, despite having legal standing, was opaque in practice.¹⁹ The AAMC has defined holistic review as a “flexible, highly-individualized process by which balanced consideration is given to the multiple ways in which applicants may prepare for and demonstrate suitability as medical students and future physicians.”²⁰

Over time, the AAMC’s work on holistic admissions coalesced into the Experience-Attributes-Metrics Model (EAM).²¹ The EAM Model is intended to provide “operational guidance” to users and offers examples of applicant characteristics medical schools might include to broaden their evaluative lens when screening, interviewing, and deciding whom to admit. In practical terms, the EAM Model is a guide medical schools can use as they balance their need to admit students whose MCAT scores and undergraduate GPA indicate they will perform well in the foundational science curriculum, with their desire to admit students whose personal attributes and life experiences are aligned with their institutional mission.

Historically, medical schools’ use of holistic review is rooted in the student admissions process and an effort to increase the number of URM medical students and physicians in practice. However, the principles underpinning holistic review have encouraged institutions to conceive of diversity in broad terms and consider, in addition to individuals’ race and ethnicity, their sexual and gender identity, disability status, and experiences specific to geographic place. Moreover, the conceptual framework of holistic review has broader application than the student

admissions process and medical schools are increasingly engaged in understanding how it can be used to influence the wider culture of medical education, including student affairs, graduate medical education (GME), and the hiring and advancement of faculty and positions of administrative leadership.

Objective and methods

The purpose of this issue brief is to summarize key issues described in the current literature related to the use of holistic review processes in medical education, and findings from a series of telephone-based, key informant interviews conducted with representatives of schools and health systems who are widely recognized leaders in the use of holistic review in medical education. These key informants shared their institutions' experiences with the implementation of holistic review initiatives, focusing on best practices, important lessons learned, and ongoing challenges.

The key informant interviews lasted approximately one hour and were recorded and transcribed for accuracy. Seven individuals were interviewed, representing six unique institutions across the country.

Findings

The findings in this issue brief are organized into two main sections. The first section focuses on the use of holistic review in medical school admissions. The second section describes how holistic review is expanding into other aspects of medical education, including student affairs, graduate medical education, and the hiring and advancement of faculty and positions of administrative leadership.

Holistic student admissions

A formal process aligned with institutional mission

Although the influence of the holistic review framework is spreading to other facets of medical education, its point of origin is the admissions process. Medical schools typically assess criteria other than MCAT scores and undergraduate GPA when evaluating a student's application for admission. However, key informants distinguished this practice from a formal and systematic holistic review process. The foundation of holistic review is an institution's mission and educational goals, which serve as the focal point for the various criteria used to both recruit and evaluate applicants, and foster a shared understanding of the rationale and goals of holistic review among the broader medical school culture and the community it serves. One key informant noted, "A highly structured holistic review process is critical for the sake of consistency and fairness, it has to be reproducible." This is essential, as holistic admissions practices must be able to withstand legal scrutiny, particularly with respect to race-conscious policies. Another key informant added, "You have to be able to defend yourself in a lawsuit, which in higher education, it's the admissions process that is often the subject of a suit."

Leverage existing resources

Key informants cited the AAMC's holistic review project as a critical resource for medical schools interested in implementing a holistic admissions process. This initiative has produced a series of publications²² describing the conceptual framework in detail, and that offer practical examples of how to develop and integrate principles of holistic review into the admissions process and utilize methods of assessment and evaluation, and provide guidance on legal and policy issues. The AAMC also conducts an in-person Holistic Review in Admissions workshop. Two of the key informants, both formally trained to conduct these workshops on behalf of the AAMC, emphasized the benefit of that experience when helping to implement and administer holistic review initiatives at their current institutions. Another key informant cited the value of the AAMC workshop experience as a participant, "I thought it was very helpful, in the sense of providing the people who were intimately involved in admissions a paradigm, a system of guiding principles, as opposed to their own parochial ideas about what works, and who's a good candidate and who isn't."

The importance of transparency

Given the high stakes of applying to medical school, key informants stressed the importance of transparency in a holistic admissions process. One key informant, representing a medical school at a large, public university, noted that all of the academic and non-academic criteria used to evaluate applicants are detailed on the school's website. Expectations for the types of experiences and specific personal attributes of interest, and how these are connected to the school's mission, are made explicit to all applicants. This key informant commented, "We are a very mission-focused program, we want applicants to be absolutely clear about who we want to admit. And we need to make sure that everyone within the medical school, all the administration and faculty who aren't primarily involved with admissions, as well as the communities we ultimately serve, understand what we are doing and why. It's very important that the whole process be transparent and fair to everyone who has a stake in the outcome."

Blind the process to academic performance

MCAT scores and undergraduate transcripts are the most important factors in deciding which students will be invited for interviews,²³ while applicant ratings in the interview stage are the most important factor determining an offer of admission.²⁴⁻²⁵ However, knowledge of applicants' academic performance metrics may be a source of bias during the interview stage, affecting the scores that interviewers assign.²³ One key informant reported the practice of blinding reviewers to academic metrics if an individual's initial application meets the school's threshold for a

minimum combined MCAT score and undergraduate GPA. In other words, once that threshold is met, nobody involved in the admissions process, at any point, has access to information related to the applicant's academic performance. The key informant commented, "Once we've determined an applicant has the academic ability to be successful in our program, we want focus on the characteristics and experiences that are closely aligned with our mission and this process allows us to do that."

Systematic evaluation of non-objective information

Holistic admissions involves assessing subjective information. Evaluating an applicant's attributes and experiences in a reliable, valid and fair manner is challenging. In 2013, the AAMC published a list of interpersonal and intrapersonal competencies associated with success in undergraduate medical education, postgraduate training, and professional practice.²⁶ However, individual medical schools still must make decisions regarding what to consider as compelling examples of those attributes, and how to best assess them.²⁷ Similarly, determinations must be made about how such attributes are reflected in the types of experiences applicants reference, how those experiences are aligned with the institutional mission, and how the depth of experience should be assessed.

In some cases, finding evidence of a desired attribute is straightforward. For example, one key informant described the process used to determine whether an applicant has a rural background. An applicant's home address is located within a county and Census data is used to determine whether that county has a rural designation. If an applicant lists a rural home address, the institution looks for further evidence of his or her rural background contained in the initial application, a secondary application, and at the interview stage, as an applicant moves through the process.

Assessing other types attributes or experiences are necessarily more subjective in nature, for example, *resiliency*, *ethics*, or *service to others*. Key informants emphasized that the first step in evaluating the evidence for a particular attribute, competency, or experience is to develop a working definition of that thing. In many instances, institutions can use the framework developed by the AAMC as a guide, but if not, it must be produced internally. One key informant noted that once a working definition is established, the next step is to develop guidelines regarding what constitutes compelling versus less compelling evidence of the attribute or experience being assessed, commenting, "All applicants go through the same structured process whereby two individuals screen each initial application and then two more review each secondary application. At each stage we use a scoring rubric to evaluate the evidence for the different attributes and experiences we're looking for and each applicant gets assigned an overall score." This key informant noted, "It's not about the number of hours, it's the quality and depth of experience. We aren't looking for a recitation of the facts. We want to see evidence that these experiences have been meaningful for you, that you can articulate the value of the experience." If there is a disagreement between the two raters at either stage of the process, they discuss the strength of the evidence and make the case for their assessment. If conflicting assessments remain unresolved after this deliberation, the application materials are assigned to a third reviewer who is blind to the results of the prior evaluations. The decision regarding whether to advance the applicant in the admission process is based on the highest two of the three overall scores.

Multiple Mini-Interview (MMI)

An important criticism of the holistic review framework is that the tools and methods used to assess and evaluate applicants, and ultimately make decisions regarding admission, have not been sufficiently tested for reliability and validity.²⁸ Several key informants emphasized the value of using the Multiple Mini-Interview (MMI) format at the interview stage. The MMI format was developed in the early 2000s by researchers and educators at McMaster University School of Medicine in Hamilton, Ontario to improve the ability of medical school applicant interviews to assess non-cognitive variables associated with success in medical school and professional practice. The MMI was designed to increase the reliability of the interview process by reducing the effect of subjective bias in the traditional interview format. Sources of bias include variability in the interview structure and how it is conducted, interviewers' access to a candidate's academic performance data, unintentional non-verbal communication between members of the interview panel, and interviewers' personal background and expectations regarding who makes for a good medical student and physician.²⁹

The format of the MMI varies depending on the medical school, but typically involves anywhere from six to ten short interviews, each with a different interviewer, each on a different topic that is known to the applicant before the interview begins. The topics can be tailored to assess aspects of interpersonal communication, critical

thinking, self-reflectiveness, or other non-cognitive attributes such as conscientiousness, perseverance, open-mindedness, and empathy. Most importantly, the content of the MMI can be designed to elicit examples of attributes that are aligned with the medical school's mission.

Several key informants noted that “enhancing the diversity of the admissions process” was a priority, and that the use of MMI facilitated this goal. The MMI format is both logistically and operationally ambitious, given the number of interviews that need to be conducted and the number of individuals involved. “We realized right away that we would need to involve a much larger group of people to pull off using MMI. So we took the opportunity to think about how we could use that to our advantage and incorporate a more diverse set of perspectives,” said one key informant. Participants in this institution's MMI process have included physicians unaffiliated with the medical school, non-physician healthcare providers, medical students, other graduate level health professions students, individuals who have been patients within the health system, as well as members of the community. Said one key informant, “I think the advantage of using MMI is that you dilute individual biases. I'll use a medical analogy, when you biopsy a mass, you never take just one sample, you take multiple samples to improve the diagnostic yield, the accuracy. It's the same idea with the multiple interviews. You're never going to get rid of individual biases, but when you increase the number of interviewers, you dilute it, you mitigate its effect.”

Situational Judgment Test

A Situational Judgement Test (SJT) is a method of measuring the implicit social-behavioral traits associated with an individual's judgement. An important element of the theoretical basis for the SJT is the concept of behavioral consistency, essentially, the notion that current behavior is a good predictor of future behavior.³⁰ Thus the SJT may be a reliable predictor for how a potential medical student will behave as a future physician. The administration of the SJT typically involves presenting an individual with hypothetical scenarios (in written, audio, or video format) that are likely to be encountered in a given professional role (e.g. physician). Test-takers then identify what they believe to be the appropriate or most effective action, given a set of options. SJTs have been used by professional organizations in the context of personnel selection for decades and have been shown to be reliable, valid, and accurate.³¹ Currently, SJTs are utilized as a selection tool for medical education and training, as well as other healthcare fields, in the United Kingdom, Canada, and Australia, among other countries.³²

Over the past several years, the AAMC has developed a SJT for use by US medical schools, designed to measure knowledge of “effective and ineffective behaviors”³³ related to eight core competencies: *Service Orientation, Social Skills, Cultural Competence, Teamwork, Ethical Responsibility to Self and Others, Reliability and Dependability, Resilience and Adaptability, and Capacity for Improvement*. The SJT will enhance holistic review by providing admissions committees a reliable assessment of these pre-professional competencies. The AAMC has suggested it may be used during the pre-interview screening stage. However, it could be incorporated into the interview stage of the admissions process as well, as one of the stages in the MMI.³² The AAMC is in the process of a multi-stage evaluation of the SJT and will pilot it in two medical schools³⁴ for the 2021 application cycle. Goals of the pilot include an understanding of how to optimize both the administration of the SJT and its integration into the admissions process.³³ Two key informants stated that they expect to incorporate the SJT into their admissions process in the future.

Socioeconomic disadvantage (SED) score

One of the key informants referenced the use of a composite measure of socioeconomic disadvantage (SED) to increase the number of qualified applicants who are URMs, or from disadvantaged backgrounds.³⁵ This approach uses an applicant's socioeconomic data to construct a standardized value that measures a student's overall SED; a high value indicates greater disadvantage. This value is used to adjust applicants' undergraduate GPA and MCAT scores; the rationale being that socioeconomically disadvantaged applicants' academic performance metrics are negatively impacted by factors other than academic ability. These include “decreased access to educational resources from an early age, lower quality schools, greater employment demands during college, and lack of financial means for test preparation classes or materials.”³⁵ The researchers who developed this approach also tested the effect of applying the adjustment factor to account for the likelihood that disadvantaged applicants have limited access to the types of experiences valued by medical school, such as academic or clinical research, or community service.

An advantage this approach may offer is that it relies entirely on quantitative information. As one key informant commented, “There is a deep cultural bias among medical school admissions committees that favors numbers”, referring to the preference given to MCAT scores and undergraduate GPA in the admissions process. A metric

capable of quantifying applicant characteristics in a way that produces a socioeconomically and racially and ethnically diverse pool of qualified applicants has the potential to be an effective means of “influencing the behavior of admissions committees, simply because it is quantitative information”, the key informant noted.

The SED assessment model is considered complementary to holistic admissions practices, not a substitute for it.³⁵ The SED assessment model is not yet widely used, but has been tested in simulations using actual applicant data from a large, public university in California. Those simulations demonstrated its potential “for reducing medical school admissions disparities and increasing the racial/ethnic and socioeconomic diversity of the physician workforce.”³⁵ The simulations also showed that medical schools would not need to adjust applicants’ academic metrics to such an extent that it resulted in admitting students unlikely to succeed. The SED assessment represents another tool that could be used to achieve medical schools’ mission-based admissions goals.

Evaluating the process and outcomes

Key informants emphasized the importance of evaluating both the processes and outcomes associated with holistic admissions. These components are linked to one another; a process evaluation can take many forms, but essentially involves a systematic examination of each action taken (e.g., outreach and recruitment, assessment of the application materials, interviews, internal/external communications) and making a determination about its effectiveness in achieving the expected outcome. One key informant described the formation of a multidisciplinary group that meets regularly to assess the different admissions tools being used, noting, “We are focused on making sure that the assumptions we’ve been making are actually reflected in the outcomes, and if they are not, what changes are needed.” The school uses the MMI format for applicant interviews and has collected data on the outcomes of that process for the past five years. The key informant commented, “We learned that some of the scenarios we’ve been using show group differences in performance and we determined that we had to throw out a scenario because it produced biased results.” The institution has a mission to train physicians with rural backgrounds and analysis of the MMI data showed that the scenario in question was producing systematically lower ratings of applicants from rural high schools.

Another key informant described how staff from the institution’s admissions office and diversity affairs office meet weekly to assess strategic activities related to recruitment, applicant engagement and retention, and ensuring that students who receive an offer of admission actually matriculate. The informant emphasized, “We are constantly thinking about an evolving set of tools and resources and engagement strategies we can deploy that will get applicants, particularly those from underrepresented and disadvantaged backgrounds, to see us as their school.” The institution has developed a sophisticated database that allows staff to analyze the effectiveness of different tactics and thus refine strategy, and the informant noted, “We feel like we understand our pool of applicants, both the characteristics of students who choose to accept and matriculate at our program and those who go elsewhere.” It was emphasized that once students have matriculated, there is a proactive effort to understand how students feel about the experience of recruitment versus that of being a medical student, the key informant added, “The students are part of our recruitment strategy and we partner with them to understand what they think was missing in the recruitment process and what we could do differently.”

Arguably, the most important short-term outcome for medical schools using a holistic admissions process is a more diverse pool of qualified applicants, and ultimately matriculated students. Historically, holistic admissions has emphasized racial and ethnic diversity and there is evidence that institutions that have committed to achieving this outcome have been successful. In the early 2000s, Boston University School of Medicine undertook a “systematic transition” from the conventional admissions practice of focusing predominantly on academic performance, to a process based on holistic review principles.³⁶ Several years into this transition, the share of first-year URM medical students had nearly doubled (from approximately 11-12 percent, pre-holistic review practices, to 20 percent).³⁶ A recent study of the impact of holistic review found that medical schools that had participated in the AAMC Holistic Review in Admissions workshop experienced “significant and sustained increases” in racial and ethnic diversity among accepted applicants and matriculants.³⁷ A key informant, representing a medical school that has deeply integrated the principles of holistic review into its culture, commented, “When we started on this process just over a decade ago, URMs accounted for just ten percent of our students. Last year it was 45 percent.” Of course, student diversity encompasses more than racial and ethnic composition. Research has shown that use of a holistic review framework in admissions also increases the diversity of qualified applicants with respect to gender, age, socio-economic status, geographic background, first-

generation undergraduate status, level of educational attainment, as well as employment experience, exposure to healthcare, and demonstrated community service.¹³⁻¹⁴

Successfully matriculating a more diverse medical student body engenders a responsibility to evaluate the impact of that diversity. This entails assessing features of the medical school environment, including the curriculum and modes of pedagogy, engagement with faculty or clinical residents through mentorships, the quality of peer interactions, and perceptions of the institutional, cultural climate.³⁸ Key informants acknowledged a need to better understand the “lived experience” of medical school, in particular how the principles of holistic review that are emphasized in the recruitment and admissions process are experienced by students after matriculating. For example, one informant emphasized a need to assess student engagement, “We want to know how they are enabling or creating change within the culture here. What did they do that is now a signature attribute of the program?” Another key informant echoed this idea, commenting, “We haven’t studied student perceptions of the courses or their perceptions of how well we’re integrating the concept of diversity into the curriculum. We haven’t looked at what the educational benefits of diversity are locally, and I know we need to do that.” Evaluating the impact of holistic admissions also requires monitoring outcomes related to student success. For example, are students successfully advancing from one year to the next throughout medical school? Which students are at risk for attrition? How do students perform during clinical rotations and the United States Medical Licensing Examination (USMLE) Step exams? Have students needed to appear before the school’s professional code or student progress committees?³⁹

Critically, holistic admissions must be evaluated in terms of longitudinal, professional outcomes. A core value proposition of the holistic review framework is its potential to transform the workforce in ways that ameliorate long-standing and persistent disparities in health outcomes and access to the healthcare system. Key informants noted that tracking the types of residency programs into which their graduates match is commonplace among medical schools, but knowledge of what their graduates do beyond that point is not. Key informants acknowledged a need for medical schools to collect data related to professional practice, including practice setting and location, characteristics of the patient population served, as well as information describing professional conduct such as being active in community service, or even facing state medical board disciplinary action.

Expanding the role of holistic review in medical education

Although the conceptual framework for holistic review was originally developed in response to medical schools’ need to ensure that admissions policies promoting student diversity were mission-based and legally sound, its principles have broader application. Key informants described how these principles are being used to transform medical school student affairs, applicant selection for residency programs, and the recruitment and advancement of medical school faculty and senior administration. Moreover, they emphasized that these various efforts are not taking place in isolation; they are interrelated and each effort both influences and is influenced by the others. Key informants uniformly regarded the expanding influence of the holistic review framework as part of a larger, transformative, cultural shift in medical education.

Holistic Student Affairs

Student affairs encompasses an array of functional areas within a medical school, including outreach/recruitment and admissions. Key informants indicated that their medical schools are increasingly focused on expanding the principles of holistic review into other key areas of student affairs, such as academic advising/support, financial aid/debt management, diversity affairs, and mentoring and career services. A broad objective of these efforts is to foster a more cohesive culture across these different functional areas; one that is mission-aligned and reflective of the ideals being communicated through various channels to prospective students, staff, faculty, and the community.

This is particularly important in terms of avoiding the kind of dissonance that occurs when the experience of medical school culture differs from student expectations. For example, URM medical students have reported experiences of racial prejudice and discrimination, and “feelings of isolation and different cultural expectations” that negatively impact their medical education.⁴⁰ Discordance between the expectations students have developed as a result of the institutional messaging around holistic admissions and its promotion of diversity and inclusion and the actual experience of medical education has consequences for student well-being. As one key informant noted, “Compositional diversity on its own doesn’t necessarily reap you the benefits associated with having a

diverse student body.” Medical schools have a responsibility to provide opportunities that support and amplify those qualities of students’ lived experience that compelled the programs to admit them in the first place. Said another key informant, “All of the functional areas within the medical school, and increasingly our GME programs, work together to support students, trainees, and faculty who are from backgrounds underrepresented in medicine. And it starts with leadership around our shared accountability to foster a culture and climate of inclusion.”

Key informants provided examples of what their programs do to ensure students from non-traditional backgrounds are successful. The use of risk models to identify potentially academically vulnerable students was common. These models help student affairs professionals anticipate a need to provide supportive resources and monitor individual students’ progress. Key informants emphasized that being academically vulnerable is not always related to a student’s academic preparation. “The dominant culture of academic medicine is sink or swim,” remarked one key informant. Students whose life experiences are radically different from that ethos can be expected to find it challenging. Risk models can incorporate student attributes such as first-generation to attend college, or foreign-born, or the intersection of multiple attributes that are underrepresented in medicine, thus improving the ability to predict a need for individual support. One key informant noted that because of the improved understanding as to which students struggle, and at what point, the institution had hired a dedicated learning specialist, and expanded both its wellness and disability resources, as well as its roster of faculty mentors and advisors of color.

The holistic student affairs model emphasizes support for students whose backgrounds and experiences are underrepresented in medical school. However, it is designed with the intention of promoting shared accountability for creating a culture that enables everyone to thrive. The overarching objective is to ensure the entire medical school community recognizes the benefits of diversity.

The mission-based curriculum

Although it is a still-developing area, key informants provided evidence that content and experiences aligned with mission-based educational goals are being integrated into curricula. One key informant, who represented a community-based medical school focusing on population health and leadership in rural and underserved communities, emphasized that one of the school’s goals is to encourage students to commit themselves to finding solutions to persistent challenges affecting the health of rural and underserved populations. The informant noted that all students are required to complete a scholarly project that addresses such an issue. The school also has a required leadership-training component that provides master’s level coursework exposing students to theories of leadership and teams, important business case studies, the business operations of medical practice, and unique features of community health systems, among other relevant topics. This school also structures students’ core clinical training as longitudinal clerkships in multiple clinical areas contemporaneously, over the course of an entire year, in contrast to the convention of focusing on just one clinical area at a time for a period of several weeks. This structure promotes the development of patient relationships and continuity of care, which are goals consistent with the school’s mission of providing community-based care. Finally, the school has a requirement that students complete clinical experiences in rural or underserved settings.

Several key informants also reported the use of special tracks within the curriculum that focus on vulnerable populations, most commonly rural or urban underserved communities. The objective of these “curricular tracks” is to provide a continuity experience in a clinical setting, for example a community health center, and with a specific patient population. Students recruited into these tracks have demonstrated a commitment to serving these communities, and as one key informant noted, “We are matching the curriculum to the life experiences of these students and making sure they have an opportunity to deepen that connection.”

Holistic review in graduate medical education

In the same way that undergraduate medical programs have relied on MCAT scores and GPA to evaluate applicants, residency programs have relied on USMLE Step 1 scores. However, the evidence indicates that Step 1 scores are only weakly correlated with performance as a physician.⁴¹ The fact that holistic admissions processes are widely used at the undergraduate level, but not among graduate medical education (GME) residency programs, has raised concerns.⁴² Students who are valued by medical schools for their personal qualities and life experiences, as opposed to their academic performance alone, may face the prospect of poor match results because residency programs rely almost exclusively on Step 1 scores to screen applicants for interviews.⁴¹ There is some evidence that reliance on Step 1 scores alone results in URM applicants being disproportionately denied an interview.⁴³ The goals of holistic review in the context of GME overlap with those of

undergraduate medical education: promote the benefits of a diverse learning environment, improve physician workforce diversity, address population health disparities, and improve access to care.

The University of Texas Health Science Center at Houston recently piloted a holistic review-based residency selection process that produced a more racially and ethnically diverse cohort of residents.⁴⁴ The application review process utilized a consensus-based, mission-aligned set of experiences and attributes to assign scores to each applicant. These included a demonstrated “commitment to the underserved, substantive leadership roles, and fluency in Spanish”, and the applicants’ self-identified race/ethnicity being representative of Houston’s population demographics.⁴⁴ The process also involved making a downward adjustment to the minimum Step 1 score used to screen out applicants in previous years. The new cut off was based on consensus and viewed by stakeholders as unlikely to influence board exam pass rates in a significant way.⁴⁴ As a result of this adjustment, applicants who scored well in terms of attributes and experiences, but whose Step 1 scores would have been too low in years past, were considered for an interview. During the interview process, the program emphasized its “commitment to training a diverse group of residents”, used a more diverse group of program faculty to conduct interviews, revised the content of the interview guide and used a structured interview format. Prior to conducting applicant interviews, faculty involved in the pilot program received unconscious bias training.⁴⁴ This process resulted in a three-fold increase in the number of URM physicians being accepted into the internal medicine residency program over the course of two years. This approach may be especially effective for institutions that sponsor both undergraduate and graduate medical education, providing an opportunity to align the residency selection and undergraduate admissions processes to emphasize applicant criteria consistent with the institutional mission and principles of holistic review.

Holistic review for hiring and advancement

As the influence of holistic review spreads throughout different aspects of medical education, there is evidence that institutions are beginning to explore how the framework’s principles can be applied to hiring and advancing faculty and senior administration. Baylor College of Medicine has developed a holistic review framework that is currently being applied to new and ongoing faculty searches, and is being piloted by select departments for the faculty advancement process. The framework is the result of key members in the university’s leadership structure engaging in a multi-step process to develop consensus-based criteria consistent with the AAMC Experience-Attributes-Metrics (EAM) model of assessment. However, the development process made it clear that the application of holistic review in this context is distinct from undergraduate or GME admissions processes.⁴⁵ The team leading this effort acknowledged the difficulty of balancing consideration of the myriad relevant attributes, including institutional values for faculty and administrative leadership “(i.e. integrity, professional stature, innovation, leadership, intellectual curiosity, team-mindedness)”, those prescribed by employment law “(i.e. skills and abilities, professionalism, honesty)”, and Baylor’s mission-based diversity outcomes related to Liaison Committee on Medical Education accreditation “(i.e. values and beliefs, languages spoken, cultural competence, individual interests)”.⁴⁵ The undertaking also confirmed that aspects of the EAM assessment model would be dependent on the specific faculty or administrative position being filled, and that criteria to assess academic metrics, in particular, would necessarily be tailored to meet the needs of each medical specialty or health sciences school within the university system.⁴⁵

Conclusion

Holistic review provides medical education institutions an effective framework for developing tools and processes to operationalize mission-aligned goals related to diversity, inclusion, workforce development, and population health. Although holistic review is historically rooted in a desire to increase the number of URM students admitted to medical school, it promotes a broad conception of diversity and has application beyond the student admissions process. Among those institutions that have embraced it in practice, holistic review is systematic and comprehensive. It requires building consensus across myriad functional areas of an institution to support its rationale and goals, and strong leadership to foster a sense of shared accountability. Its principles represent a potentially transformative, cultural shift in medical education and the delivery of healthcare.

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