What Premedical Students Need to Succeed: Updated Premed Competencies for Entering Medical Students

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Abstract

Problem

The 15 core competencies for entering medical students (now "premed competencies") were created in 2011 to describe the skills and characteristics needed for success when starting medical school. Changes in the health care landscape and undergraduate medical education over the past decade required review and revision of the original competencies to ensure they still accurately reflected expectations for entering medical students.

Approach

From August 2022 to May 2023, the Association of American Medical Colleges formed the Premed Competencies Working Group with members of the medical education community to evaluate the core competencies in 2 phases. In the first phase, focus groups discussed *what* and *how* medical students are learning, as well as the qualities and characteristics associated with students who are successful versus those who experience performance issues. In the second phase, focus groups provided feedback on revised competency definitions.

Outcomes

Much of the original core competencies remained relevant and important. However, revisions were needed to emphasize or elaborate on specific aspects of the preprofessional competencies (also known as the "core personal competencies") to better reflect expectations for current and future entering medical students. The revised set includes a total of 17 premed competencies that span professional, science, and thinking and reasoning areas.

Next Steps

The updated competency model and related guidance materials were disseminated to the medical education community to support its use. For aspiring applicants, the premed competencies provide a developmental roadmap as they prepare for medical school by communicating professional values and expectations. For institutions, the competencies provide an updated framework for evaluating applicant readiness through holistic review and support continuing institutional efforts to evolve curricula and cultures to foster further professional development in students.

Problem

Being a physician requires a broad range of competencies. Some reflect the ability to consume and understand vast amounts of ever-changing scientific knowledge and apply it to patient care. Others reflect attributes like respect, integrity, compassion, and trustworthiness.[1] These skills and attributes underlie technical and professional competency areas and remain important competencies throughout a physician's medical career. Developing these competencies is essential to cultivating a capable, compassionate, and professional next generation of physicians.

Competency-based medical education helps students grow into successful physicians.[2] The 6 Accreditation Council for Graduate Medical Education (ACGME) competency domains define the broad range of necessary knowledge, skills, and attitudes expected of medical students upon entering residency to develop during their postgraduate training.[3] However, these competencies are too advanced to serve as appropriate measures of ability for premedical students or aspiring applicants. Therefore, in 2011, the Association of American Medical Colleges (AAMC) created the 15 core competencies for entering medical students to guide aspiring applicants on important foundational skills needed in medical school.[4] Like the ACGME competency domains, and in accordance with competency modeling best practices in the field of industrial-organizational psychology, these competencies covered a broad range of competency areas, including 9 preprofessional, 4 thinking and reasoning, and 2 science competencies, each of which was described using behavior-based definitions. These have served several purposes, including signaling important areas for applicant preparation and development for medical school and supporting evaluation of applicant readiness as part of holistic review by admissions committees.

However, the continually changing landscape of health, health care, and society has resulted in the need to review and update these competencies to emphasize or elaborate on specific aspects of the preprofessional competencies that better reflect expectations for current and

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future entering medical students. For instance, the influence of socioeconomic factors, such as poverty or the impact of health care access on an individual's health, has become more widely understood,[5] resulting in a growing need for physicians to be sensitive to the kinds of sociological and humanistic factors associated with illness and patient care.[6] Physicians also encounter patients from increasingly diverse backgrounds and with different values, beliefs, and practices, prompting a greater need for more nuanced skills like cultural humility and sensitivity, which ensure individuals from all communities can thrive, be valued, and be respected.[7]

Many medical schools have been adjusting their curricula to address the needs of the current health landscape[8] and to accelerate the use and adoption of technology to support both synchronous and asynchronous learning, particularly after the COVID-19 pandemic.[9] However, these recent changes were not reflected in the original core competency model. Thus, the AAMC formed the Premed Competencies Working Group (PCWG) with volunteers from the medical education community to conduct a review and update of the core competency model to ensure it accurately reflects contemporary expectations for entering medical students. The authors of this article were members of the PCWG, which was composed of 7 medical school representatives (A.H., J.K., A.A.L., J.A.W.), 2 prehealth advisors (B.K.), and 2 AAMC staff members with expertise in developing assessments of personal characteristics (L.F., R.F.).

Approach

From August 2022 to May 2023 (see Figure 1), we used a rigorous 2-phase process to (1) evaluate the 15 core competencies, including through literature reviews and data collection from a total of 23 focus groups, representing more than 100 medical schools, and (2) update the core competencies (now the "premed competencies") to reflect expectations for current and future entering medical students. This study was reviewed and declared exempt by the American Institutes for Research Institutional Review Board. We sent invitations for volunteers widely through the medical education community (e.g., through list servs) to recruit representative samples (see Supplemental Digital Appendixes 1–3 for background and demographic characteristics at http://links.lww.com/ACADMED/B703). We collected input from prehealth advisors, medical students, admissions officers, faculty, and staff supporting student affairs and diversity, equity, and inclusion. Representatives from U.S. MD- and DO-granting schools were included to ensure the final competencies were relevant to both types of undergraduate medical education (UME) training.

In the project's first phase (August 2022–October 2022), we facilitated 10 focus groups of 64 participants with medical school representatives (e.g., admissions, student affairs, faculty, etc.) to identify curriculum and context changes in UME over the past decade. We asked focus groups about the current and future roles and responsibilities of students in the first and second years of medical school, including *what* students are learning (i.e., topics, content areas) and *how* students are learning (e.g., lecture, case-based learning, patient encounters, virtual learning). We also asked participants to identify the qualities and characteristics associated with students who are successful versus those who experience performance issues. From this discussion, we grouped expectations for entering medical students into characteristic themes, which we then mapped to the original set of preprofessional competencies to identify which and how the competencies needed to be updated (see Table 1). We found that changes only needed to be made to the 9 preprofessional competencies (also known as the "core personal competencies").[4,10]

In the second phase (November 2022–May 2023), we drafted updates to the preprofessional competency definitions and then facilitated 13 additional focus groups of 104 participants with prehealth advisors, medical students, and medical school faculty and staff. We asked participants to provide feedback on the (1) appropriateness of the updated preprofessional competencies for entering medical students; (2) accuracy of key behaviors and characteristics for entering medical students; and (3) use of clear, concise, and user-friendly language for applicants, advisors, and medical schools.

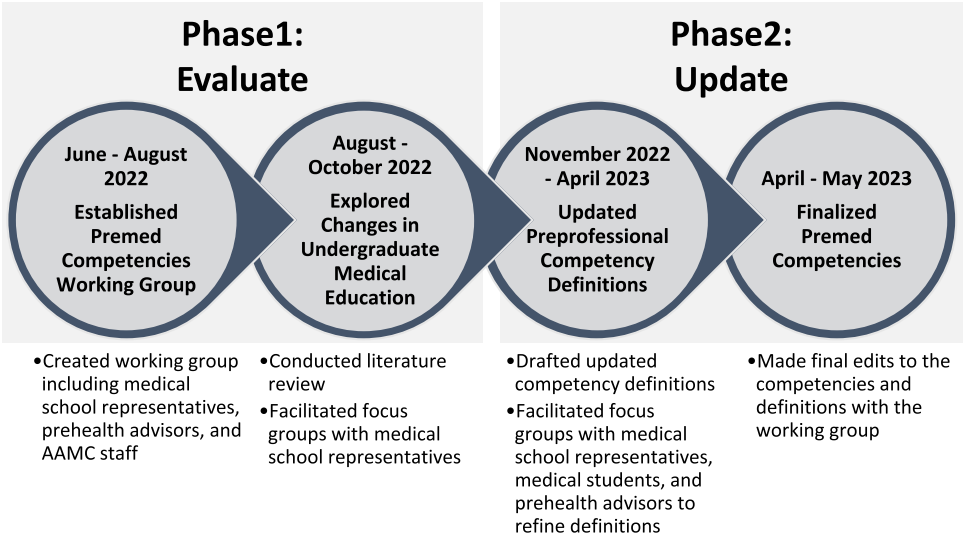

Figure 1 A summary of the timeline and process for updating the core competencies for entering medical students to become the premed competencies from June 2022 to May 2023, including several cycles of focus groups and revisions. Abbreviation: AAMC, Association of American Medical Colleges.

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Outcomes

Much of the original core competencies remained relevant and important. This section describes how insights from phase 1 about changing expectations of entering medical students informed revisions of the preprofessional competencies.

Evolving expectations for entering medical students

While some aspects of medical education have remained the same amid the rapidly changing health care landscape, phase 1 focus groups shared how the educational environment has evolved significantly over the past decade, resulting in changes to medical school curricula. These changes include earlier incorporation of clinical experiences; greater prevalence of interdisciplinary, team-based patient care; classroom technologies that enable both live and asynchronous virtual learning; greater incorporation of diversity, equity, and inclusion-related content; and more robust support for student well-being.

Table 1

Preprofessional Competencies[4] Mapped to Personal Characteristics of Successful Medical Students Identified During Phase 1 Focus Groups, August 2022–October 2022

Preprofessional competency	Personal characteristics of successful medical students
Capacity for improvement	• Growth mindset • Tolerance for ambiguity • Professional identity • Self-efficacy • Humility and vulnerability
Cultural competence	• Patient advocacy • Understanding of the social determinants of health • Cultural humility • Humility and vulnerability • Conflict management • Emotional intelligence • Perspective-taking • Nuanced thinking
Ethical responsibility to self and others	• Professional identity • Patient advocacy • Understanding of the social determinants of health • Nuanced thinking
Oral communication	• Patient advocacy • Active listening • Conflict management • Emotional intelligence • Perspective-taking
Reliability and dependability	• Ownership/personal accountability • Professional identity • Self-efficacy
Resilience and adaptability	• Stress and anxiety management • Tolerance for ambiguity • Self-efficacy • Humility and vulnerability
Service orientation	• Commitment to something bigger than oneself • Professional identity • Patient advocacy • Understanding of the social determinants of health • Perspective-taking
Social skills	• Professional identity • Conflict management • Emotional intelligence • Perspective-taking
Teamwork	• Professional identity • Leadership and followership balance • Humility and vulnerability • Conflict management • Perspective-taking

With these underlying curricular shifts in mind, phase 1 focus group participants highlighted the personal characteristics (e.g., perspective-taking, humility, accountability) of students who tend to navigate the first 2 years of medical school more easily. Table 1 maps these characteristics to the preprofessional competencies. This mapping illustrates both the enduring nature of some competencies and the changing nature of others. Specifically, certain dimensions of each preprofessional competency (e.g., balance between leadership and followership in teamwork) called for greater emphasis or elaboration to better reflect the current and future expectations of entering medical students. To describe these competencies more accurately for the intended audience, we changed the name of the preprofessional competencies to the "professional competencies," and the overall model from the core competencies for entering medical students to the "premed competencies."

Updated premed competency model

Table 2 presents the complete premed competency model, including 17 competencies across 3 areas (i.e., professional (formerly "preprofessional"), science, and thinking and reasoning), the current definitions, and the updated focus of each professional competency. Both the thinking and reasoning and science competencies retained their original definitions; the changes identified in UME nearly exclusively reflected shifting expectations for students' professional competencies.

While the intent of each updated professional competency is consistent with the previous version, the revisions more clearly articulate various facets that were previously aggregated. For example, ethical responsibility to self and others now highlights the importance of more nuanced thinking and adhering to ethical standards as part of professional identity versus intimating that ethical responsibility centers on rule-following. Similarly, the competency resilience and adaptability now describe the different ways students might approach challenging situations rather than insinuating that they should overcome challenges in all situations, some of which may not have been under their control. Teamwork and collaboration (formerly "teamwork") now clarify that strong

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Table 2
Updated Premed Competency Model, Finalized May 2023

Premed competency	Definition	Updated focus
Professional[a]		
Commitment to learning and growth (formerly capacity for improvement)	Practices continuous personal and professional growth for improvement, including setting and communicating goals for learning and development; reflects on successes, challenges, and mistakes; pursues opportunities to improve knowledge and understanding; and asks for and incorporates feedback to learn and grow	Emphasizes a growth mindset in development
Cultural awareness[b] (formerly part of cultural competence)	Appreciates how historical, sociocultural, political, and economic factors affect others' interactions, behaviors, and well-being; values diversity; and demonstrates a desire to learn about different cultures, beliefs, and values	Focuses on the attitude and value one has toward different people, cultures, and backgrounds
Cultural humility[b] (formerly part of cultural competence)	Seeks out and engages diverse and divergent perspectives with a desire to understand and willingness to adjust one's mindset; understands a situation or idea from alternative viewpoints; reflects on one's values, beliefs, and identities and how they may affect others; reflects on and addresses bias in oneself and others; and fosters a supportive environment that values inclusivity	Focuses on perspective-taking, openness to differences, and self-reflection
Empathy and compassion[b] (formerly part of service orientation)	Recognizes, understands, and acknowledges others' experiences, feelings, perspectives, and reactions to situations; is sensitive to others' needs and feelings; and demonstrates a desire to help others and alleviate others' distress	Focuses on emotional connection and desire to help others
Ethical responsibility to self and others	Behaves with honesty and integrity; considers multiple and/or conflicting principles and values to inform decisions; adheres to ethical principles when carrying out professional obligations; resists pressure to engage in unethical behavior; and encourages others to behave honestly and ethically	Focuses on ethical reasoning and understanding ethical principles to guide behavior
Interpersonal skills (formerly social skills)	Demonstrates an awareness of how social and behavioral cues affect people's interactions and behaviors; adjusts behaviors appropriately in response to these cues; recognizes and manages one's emotions and understands how emotions impact others or a situation; and treats others with dignity, courtesy, and respect	Focuses on understanding how to interact with others and self-regulating behaviors
Oral communication	Effectively conveys information to others using spoken words and sentences; actively listens to understand the meaning and intent behind what others say; and recognizes potential communication barriers and adjusts approach or clarifies information as needed	Elaborates on the importance of active listening
Reliability and dependability	Demonstrates accountability for performance and responsibilities to self and others; prioritizes and fulfills obligations in a timely and satisfactory manner; and understands consequences of not fulfilling one's responsibilities to self and others	Emphasizes being accountable to both self and others, as well as understanding the consequences of not fulfilling responsibilities
Resilience and adaptability	Perseveres in challenging, stressful, or ambiguous environments or situations by adjusting behavior or approach in response to new information, changing conditions, or unexpected obstacles, and recognizes and seeks help and support when needed; recovers from and reflects on setbacks; and balances personal well-being with responsibilities	Articulates the balance among persevering in challenging situations, adjusting one's approach, and knowing when to seek help, along with the importance of personal well-being
Service orientation	Shows a commitment to something larger than oneself; demonstrates dedication to service and a commitment to making meaningful contributions that meet the needs of communities	Focuses on a commitment to helping others

(Table continues)

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Table 2
(Continued)

Premed competency	Definition	Updated focus
Teamwork and collaboration (formerly teamwork)	Collaborates with others to achieve shared goals and prioritizes shared goals; adjusts role between team member and leader based on one's own and others' expertise and experience; shares information with team members and encourages this behavior in others; and gives and accepts feedback to improve team performance	Exercises judgment to support the team as a leader or member based on the team's needs
Thinking and reasoning[c]		
Critical thinking	Uses logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems	
Quantitative reasoning	Applies quantitative reasoning and appropriate mathematics to describe or explain phenomena in the natural world	
Scientific inquiry	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	Effectively conveys information to others by using written words and sentences	
Science[c]		
Human behavior	Applies knowledge of the self, others, and social systems to solve problems related to the psychological, sociocultural, and biological factors that influence health and well-being	
Living systems	Applies knowledge and skill in the natural sciences to solve problems related to molecular and macro systems, including biomolecules, molecules, cells, and organs	

[a]Previously known as the preprofessional competency areas.
[b]A new competency added to the original core competency model.
[c]A competency area retained from the original core competency model.

teamwork requires collaboration, including adjusting how to support the team (rather than always leading).

The preprofessional competencies of cultural competence and service orientation were found to have required a wider range of critical skills. Therefore, each of these competencies was further divided into 2 distinct items. Cultural competence was split into cultural awareness and cultural humility. The former focuses on attitudes toward, and values of, different people, cultures, and backgrounds. The latter focuses on perspective-taking, openness to difference, self-reflection, and addressing bias. Similarly, service orientation was split into service orientation (name retained) and empathy and compassion. The updated service orientation definition focuses on a commitment to helping others and communities, whereas empathy and compassion focus on emotional connection and consideration for others, including the desire to help. Table 2 includes more details on updates for each competency.

Next Steps

Key uses of the premed competency model

The updated premed competency model is a community-developed set of common expectations that identifies what matriculating medical students' need to navigate medical education. The model, along with guidance resources, like competency experience and self-assessment worksheets, was widely shared with the premedical and medical school communities via listserv communications, presentations, and podcasts.

For aspiring applicants, the journey to medicine includes an often-bewildering array of guidelines and recommendations about how to be successful in the competitive admissions process. These premed competencies provide clarity around medical schools' values and expectations, and therefore offer a roadmap for applicants as they prepare to apply. This revised competency model and corresponding guidance materials should enable prehealth advisors to better counsel aspiring applicants about important skills and attributes for becoming a physician and assist them with identifying experiences that will help them develop these competencies and demonstrate them in their applications.

For the medical school community, the premed competencies provide an updated framework for evaluating applicant readiness through holistic review across all stages of the admissions process, including application screening, interviewing, and final offer determination. Further, the updated professional competencies will help

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medical schools review and refine their admissions criteria. Finally, the revised model should support schools' continuing efforts to evolve their curricula and cultures, fostering the recruitment and development of future physicians who are even better suited to meet the needs of diverse patient populations in an evolving health landscape.

Considerations for the premed competency model

It is important to acknowledge that the premed competencies will not perfectly fit the nuances and idiosyncrasies of each medical school admissions process. Schools will inevitably need to tailor their use of the competencies to their specific admissions processes, prioritizing some competencies over others or requiring greater proficiency in certain areas based on their specific curriculum, mission, and available resources. Some schools may also seek applicants with characteristics not captured in the model.

As aspiring applicants develop in professional competency areas, their approach necessarily will vary based on their access to resources and opportunities. For example, while some may pursue coursework and shadow a physician, others may rely on general life experiences or experiences outside of health care. There are many ways to develop professional competencies, and applicants may have access to different resources and opportunities. There is no uniform pathway. Likewise, medical school admissions must evaluate applicants holistically and be receptive to various ways an applicant may develop and demonstrate professional competencies through the application and interview process.

Finally, aspiring applicants will have differing areas of strength and weakness across the professional competencies, just as they do in different knowledge areas. During their preparation for medical school, applicants should engage in self-reflection to identify their strengths and development needs and seek out experiences to improve their understanding and proficiency in those competencies. Importantly, however, the purpose of the competency model is not to suggest a premedical student's development is ever complete. Rather, the competencies reflect core values that will remain important throughout a medical student's education, training, and career in medicine, and they will be expected to progress in each one. Thus, the premed competencies fit within a larger developmental framework, highlighting expectations at entry to medical school, while the foundational competencies for UME illustrate competency expectations at graduation, and the ACGME milestones reflect expectations for residency training.

Moving forward

The premed competencies not only serve as goals for individual applicants but also can motivate change in prehealth education and UME. Prehealth education should consider how to foster professional development in students. While some prehealth curricula may include more formal teaching on professionalism, others may require students to seek out an advisor, mentor, parent, or friend to help identify opportunities to learn and develop professionally. UME may also require curricular and cultural change to better support and further develop incoming students.

Finally, the premed competencies serve as a foundation for future admissions work, motivating potential updates to existing medical school applications, rubrics for assessing professional competencies, or medical school admissions criteria. Success of the premed competencies could be evaluated on how well they are integrated into—and serve—these functions. Going forward, these competencies should be revisited approximately every 5–10 years when medical education must adjust to support social and technological changes within the health care landscape.

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