

Report of the SI2025 Task Force

John F. Duval, MBA, FACHE

Lawrence M. Opas, MD

Thomas J. Nasca, MD

Paul Foster Johnson, MFA

Kevin B. Weiss, MD

Background and Description

In June 2015, the Accreditation Council for Graduate Medical Education (ACGME) Board of Directors commissioned the *Sponsoring Institution 2025 (SI2025)* project to develop a future vision for ACGME-accredited institutional sponsors of residency and fellowship programs. To accomplish this task, the ACGME Board of Directors appointed a 19-member *SI2025* Task Force composed of members of the ACGME Board of Directors, senior health care executives, education leaders, Designated Institutional Officials (DIOs), residents, and representatives of the public to guide the project (TABLE 2).

During its first meeting February 11–12, 2016, the Task Force began its work by planning a series of listening activities across the nation, to be completed over 9 months in 2016. The majority consisted of regional listening sessions, in which the Task Force led focus groups and open forum discussions, as well as “learning visits” at existing Sponsoring Institutions (SIs; TABLE 3).¹ In all, the Task Force met with 1065 diverse participants, including residents, fellows, DIOs, program directors, patient advocates, medical school deans, medical students, faculty members, interprofessional health care team members, and policy experts. All conversations were designed to engage participants in a common visioning activity: to characterize the potential structures and functions of SIs in a medical education system that will produce the physician workforce as it will have evolved in the health care system of the year 2025. Written instructions, including 3 fundamental questions, were developed to serve as the basis for all of the discussions (TABLE 4).

Listening sessions were held in Chicago, IL; Washington, DC; Houston, TX; Los Angeles, CA; Kirksville, MO; Boise, ID; and New York, NY to ensure a representative range of perspectives. Participants imagined the ways in which future aspects of the US health care system might shape their local environments, as well as graduate medical education (GME) on the national level. In these sessions, Task Force members heard from SIs that were remarkably heterogeneous in size, structure, and mission. Participants in the listening sessions drew upon their various backgrounds, including their experiences in their own SIs. The SIs that participated were themselves diverse, including publicly and privately owned entities that ranged from overseeing a single ACGME-accredited program to more than 100. Additionally, the Task Force heard from participants who were not directly involved in SIs—or, in some cases, any GME activities—but who offered their perspectives as stakeholders in health care.

The Task Force recognized that while it heard differing views of the future of health care and GME, the listening activities were designed to provide a diverse sample of individuals’ experience with health care and education in the United States. Therefore, the information gathered by the Task Force is subject to unknown bias. The Task Force sought to reduce such bias by interviewing a large number of diverse individuals from a broad range of health care and GME settings.

The listening activities explored the opportunities and threats that future SIs will face in urban, suburban, and rural settings, as well as the impact of future changes to health care delivery on the various patient populations served by participating sites for GME. To complement the information gathered in the regional listening sessions, Task Force members, in collaboration with ACGME staff, received verbal and written feedback from a number of stakeholders internal and external to the ACGME.

After the conclusion of these activities, the Task Force met October 5–6, 2016, and February 16–17, 2017, to synthesize its findings and to develop a consensus view of the future context of GME. The Task Force used its findings from the field to agree on recommendations that were to be presented to the ACGME Board of Directors. This report represents a summary of the Task Force’s fieldwork, its internal deliberations, and its recommendations.

¹ None of the information gathered in *SI2025* listening activities was used in ACGME accreditation processes.

Out of the Task Force’s listening activities emerged patterns of observations, perspectives, and predictions about health care and the education of health care professionals from 2016 to 2025. The “Findings” section of this document is based on these patterns as identified in the cumulative experience of the Task Force in its listening activities and in written feedback from some of the individuals interviewed. Findings were synthesized by the staff to the Task Force, and then presented to the Task Force for its review, revision, and approval. The Task Force synthesizes and interprets the findings presented in the “Summary of Findings” section of this report.

The findings were grouped into 8 themes that denote key changes envisioned by listening session participants over the next decade²:

- I. Changing Health Care Needs
- II. Changes in Health Care Delivery
- III. Evolution in Health Care Systems
- IV. Evolution in the Role of the Physician
- V. Evolution in the Role of Other Health Care Professionals
- VI. Evolution in Graduate Medical Education
- VII. Uncertainties in the Models for GME Funding; and
- VIII. The Role of GME in the Continuum of Medical Education

The “Findings” section articulates a collective perspective on these themes in health care, education, and GME in 2025 by way of comparison with 2016. The Task Force agreed that the listening sessions also revealed a separate, significant set of distinct issues regarding the future of the practice of medicine. This set of findings describes attributes of the profession—and professionalism—that will be subject to conflict or competition in the future.

Each finding represents viewpoints expressed by multiple participants in the listening activities, and, as such, attempts to voice the collective wisdom of a broad community of stakeholders regarding the trends and forces affecting GME. Thus, the findings articulate neither the opinions of any single interviewee nor the individual perspectives of Task Force members or ACGME staff. As a reflection of the aggregated contributions of hundreds of individuals, the findings may or may not be consistent with other attempts to describe the future of health care and medical education.

The Task Force recognizes that 2025 is not a distant horizon. Indeed, one can already trace some early aspects of the Task Force’s predictions in the present day. Nonetheless, the Task Force expects the direction and velocity of change to transform SIs in key ways over the next decade.

In its “Summary of Findings,” the Task Force identifies democratization, commoditization, and corporatization as 3 major drivers of change that appear to be guiding the future of health care, and thereby shaping the conditions to which GME will need to adapt. The Task Force recognizes that while these are not the only forces prompting change, the 3 phenomena were recognized as particularly noteworthy in the context of the summary and its recommendations. The report’s “Summary of Findings” section describes the 3 forces and their potential impact on health care, the practice of medicine, and the educational needs of residents and fellows. This section also discusses the implications of a separate set of findings related to the future of the profession of medicine, and offers a means of addressing these concerns in present and future GME. The “Summary of Findings” section ends with the conclusions that form the basis for the Task Force’s recommendations.

² An additional set of Task Force observations—“Aspects of 2016 Practice of Medicine and Concerns for the Future”—differs from the findings, in that it does not, strictly speaking, address conditions of health care and graduate medical education in 2025. Rather, this section describes important concerns about the future of the profession, and about how professionalism will be defined over the next decade.

The “Recommendations” section concludes the report by describing ways in which the ACGME can prepare GME stakeholders for the future of health care and education in SIs with new structures and functions.

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Readers are encouraged to view the components of this report as modular; that is, many sections are interrelated or self-contained, and it is not necessary to read them in a particular sequence. Some may find it useful to start with the particular findings; others may prefer to skip to the recommendations before reading the details derived from the listening activities.

TABLE 2
S/2025 Task Force Members

John Duval, MBA, FACHE , Virginia Commonwealth University Hospitals and Clinics (Chair)
Lawrence M. Opas, MD , Associate Dean for Graduate Medical Education and Designated Institutional Official, Keck School of Medicine, University of Southern California (Chair)
Thomas J. Nasca, MD, MACP , Chief Executive Officer, ACGME (Vice Chair)
Linda B. Andrews, MD , Baylor College of Medicine
Donald Wayne Brady, MD , Associate Dean for Graduate Medical Education and Designated Institutional Official, Vanderbilt University
Michael G. Glenn, MD , Chief Medical Officer, Virginia Mason Medical Center
Linda Hunt , Chief Executive Officer, Dignity Health
Charles M. Kilo, MD, MPH , Vice President and Chief Medical Officer, Oregon Health & Science University Healthcare
Victoria Konold, MD , PGY-2 Resident, Pediatrics, Advocate Lutheran General Hospital (2015–2016 Academic Year Appointment)
Richard D. Krugman, MD , Distinguished Professor, University of Colorado School of Medicine
William A. McDade, MD, PhD , Executive Vice President and Chief Academic Officer, Ochsner Health System
Carmen Hooker Odom , Public Member
Kristy Rialon, MD , PGY-5 Resident, Surgery, Duke University Hospital (2015–2016 Academic Year Appointment)
Karen Sanders, MD , Deputy Chief Academic Affiliations Officer, Veterans Health Administration (Ex-Officio)
Howard M. Shulman, DO, FACP , Associate Dean for Postdoctoral Education and Designated Institutional Official, Midwestern University Osteopathic Postdoctoral Training Institution
George Thibault, MD , President, Josiah Macy Jr Foundation
Keith Watson, DO , President, Pacific Northwest University of Health Sciences
Paulette Wehner, MD , Senior Associate Dean for Graduate Medical Education and Designated Institutional Official, Marshall University School of Medicine
Rowen Zetterman, MD , Director of Faculty Mentorship Programs, University of Nebraska Medical Center

ACGME Staff to the Task Force

Kevin B. Weiss, MD, Senior Vice President for Institutional Accreditation; kweiss@acgme.org

Paul Foster Johnson, MFA, Executive Director, Institutional Review Committee (IRC); pjohnson@acgme.org

Victoria Shaffer, Senior Accreditation Administrator, IRC

TABLE 3
List of S/2025 Listening Activities

Date	Event	Participants
2/26/16	Annual Education Conference: S/2025 Interactive Presentation	Open/general
4/28/16	Discussion: Chicago	ACGME IRC
5/11/16	Learning Visit: University of Chicago Medical Center	Senior leaders; DIO; GME staff; program directors; residents/fellows; inter-professional team members; medical students
5/11/16	Learning Visit: Rush University Medical Center	Senior leaders; DIO; GME staff; program directors; residents/fellows; inter-professional team members; medical students
5/11/16	Focus Group: Chicago	Chief medical officers; chief nursing officers
5/12/16	Open Forum: Chicago	Open/general

TABLE 3List of *S12025* Listening Activities (continued)

Date	Event	Participants
6/15/16	Learning Visit: Children's National Medical Center	Senior leaders; DIO; GME staff; program directors; physician faculty; residents/fellows; interprofessional team members
6/15/16	Learning Visit: Howard University Hospital	Senior leaders; DIO; GME staff; program directors; residents/fellows; interprofessional team members; medical students
6/15/16	Focus Group: Washington, DC	GME stakeholder organization representatives
6/16/16	Open Forum: Washington, DC	Open/general
6/28/16	Discussion: Chicago	ACGME CLER staff
7/7/16	Focus Group: Houston	Chief medical officers; chief nursing officers
7/8/16	Open Forum: Houston	Open/general
7/8/16	Learning Visit: Baylor College of Medicine	Senior leaders; DIO; GME staff; program directors; residents/fellows; interprofessional team members; medical students
7/8/16	Learning Visit: Memorial Hermann—Texas Medical Center	Senior leaders; DIO; GME staff; program directors; residents/fellows; interprofessional team members; medical students
7/27/16	Discussion: Chicago	ACGME CLER Evaluation Committee
8/4/16	Learning Visit: White Memorial Medical Center	Senior leaders; DIO; GME staff; program directors; physician faculty; residents/fellows; interprofessional team members
8/4/16	Learning Visit: LAC+USC Medical Center	Senior leaders; DIO; GME staff; program directors; residents/fellows; interprofessional team members; medical students
8/4/16	Learning Visit: Cedars-Sinai Medical Center	Senior leaders; DIO; GME staff; program directors; physician faculty; residents/fellows; interprofessional team members
8/4/16	Focus Group: Los Angeles	Patient advocates
8/5/16	Open Forum: Los Angeles	Open/general
8/16/16	Learning Visit: Still OPTI, Kirksville, MO	Senior leaders; DIO; GME staff; program directors; residents/fellows; interprofessional team members; medical students
8/31/16	Open Forum: Chicago	ACGME staff
9/7/16	Learning Visit: Family Medicine Residency of Idaho, Boise	Senior leaders; DIO; GME staff; program directors; physician faculty; residents/fellows; interprofessional team members
9/8/16	Discussion: Chicago	ACGME Coordinators Advisory Group
9/14/16	Learning Visit: Maimonides Medical Center	Senior leaders; DIO; GME staff; program directors; physician faculty; residents/fellows; interprofessional team members
9/14/16	Learning Visit: Icahn School of Medicine at Mount Sinai	Senior leaders; DIO; GME staff; program directors; residents/fellows; interprofessional team members; medical students
9/14/16	Learning Visit: Memorial Sloan Kettering Cancer Center	Senior leaders; DIO; GME staff; program directors; physician faculty; residents/fellows; interprofessional team members
9/14/16	Focus Group: New York	Medical school deans
9/15/16	Open Forum: New York	Open/general
9/22/16	Written Submission	AAMC Council of Deans
9/26/16	Discussion: Council of Review Committee Chairs	ACGME Review Committee chairs
9/26/16	Discussion: Council of Review Committee Residents	ACGME Review Committee residents
9/28/16	Organizational Discussion: Chicago	GME stakeholder organization representatives
9/29/16	Discussion: Chicago	ACGME senior vice presidents for accreditation

Abbreviations: ACGME, Accreditation Council for Graduate Medical Education; IRC, Institutional Review Committee; DIO, Designated Institutional Official; GME, graduate medical education; CLER, Clinical Learning Environment Review; AAMC, Association of American Medical Colleges.

TABLE 4Advance Instructions for Participants in *SI2025* Listening Activities

At the <i>SI2025</i> discussion, please be prepared to provide brief remarks on the future of health care and graduate medical education (GME). Specifically:
Identify up to 4 aspects of health care delivery in the United States in the year 2025 that are most likely to impact GME.
How will these aspects of future health care delivery affect the GME needs of residents and fellows?
How will these aspects of future health care delivery affect the organization of residency and fellowship training?
After the event, we welcome the submission of your written notes on these questions. You may hand them in after the event or e-mail them to SI2025@acgme.org .

Identification of Findings

Each of the *SI2025* project findings reflects viewpoints expressed by multiple individuals interviewed during the *SI2025* listening activities that occurred in 2016. As such, the findings represent neither the opinions of any single interviewee, nor the individual perspectives of Task Force members or Accreditation Council for Graduate Medical Education (ACGME) staff, nor the views of the ACGME. As a reflection of the collective opinions of more than 1000 individuals, these findings may or may not be consistent with other attempts to describe the future of health care and medical education. While the 52 findings are grouped in 9 thematic categories—including a discrete category of concerns for the future of the medical profession—the order of the findings is arbitrary, and many of the findings are interrelated.

I. Changing Health Care Needs		
	Current View	2025 Projected View
1. Patient Internet Usage and Wearable/Portable Devices	<p>The Internet is an informational tool that some people use when making health care choices, anticipating diagnoses, and managing their care. Consumers test the benefits of wearable technology in guiding their health behaviors (eg, FitBit).</p>	<p>People widely access medical information on the Internet for use in making health care choices. It is common for consumers to use wearable or portable health technology devices to manage their own care, and to assist their health care providers in diagnosis and management.</p>
	<p>Participants in the listening activities reported that it is increasingly common for people seeking health care to search for information about their symptoms, their health, and their health care providers on the Internet. This practice is becoming more widespread as patients and their families—including a growing number of “digital natives”—become increasingly adept at retrieving information, and as publicly available medical and consumer information proliferates rapidly. While the population in general was expected to become more proficient in gathering and evaluating information, there will be wide individual variability in proficiency due to differences in technical ability and access.</p> <p>This trend has variable potential to improve health care literacy, and to empower patients and families as their own health care advocates. It also presents challenges in validating information from a wide variety of sources, not all of which are trustworthy. Given these changes, it was said that health care professionals are beginning to interact in new ways—and via new media—with patients and their families.</p> <p>It was reported that consumers are expanding their commercial use of wearable or portable technological health devices. These devices are demonstrating some successes in health care, such as continuous glucose blood monitoring for patients with diabetes. Patients and health care professionals are expanding their use of these and other devices to collect patients’ health information from their homes or elsewhere, and health care professionals were reported to be finding ways to use these technologies to follow digital markers of their patients’ health status without the need for office visits.</p> <p>Listening session participants identified a number of benefits that could accompany the adoption of wearable or portable devices in health care, including convenience, cost-efficiency, and quality of care. As health systems and health care organizations develop greater capacity to use the insights provided by big data analytics, information from wearable and portable devices will increasingly be integrated with other sources to improve health care quality and reduce cost. These technologies also show promise for effective remote monitoring of low-mobility or homebound patients.</p> <p>Listening session participants also identified a number of issues and challenges associated with the use of wearable or portable devices in health care. Health care facilities will need to integrate these technologies into the patient care workflow, particularly when health care data will not be reviewed in traditional contexts such as patient rounds or office visits. Graduate medical education faculty and learners will need to be trained to interpret and/or compute data sent from devices (including large data sets), to integrate the data with other available information and to manage patient care remotely or—in some cases—in patients’ homes. It was indicated that there are early efforts to study the user-friendliness and cost-efficiency of these technologies. Technologies that rely on remote transmission of patient data will require health care facilities and professionals to grapple with information security and privacy concerns.</p>	

2. Demographics: Baby Boomers	Current View	2025 Projected View
	Baby Boomers are entering the > 60-year-old population.	All Baby Boomers have entered the > 60-year-old population.
	<p>In 2025, all Baby Boomers will be at least 60 years of age. As this generation ages, there will be an increase in the number of adults with complex and/or chronic health care and social support needs. It was not clear to participants in the listening activities whether these rising demands will be met by a sufficient number and appropriate mix of health care professionals with expertise in caring for geriatric patients. To improve health care delivery, health care systems will increasingly incorporate remote care, home care, and community-based care for older patients who are immobile, or whose mobility is impaired. According to the individuals interviewed, physicians will need to be trained to participate in the multidisciplinary teams that will be necessary to provide safe and effective geriatric care. In general, older patients will have stronger preferences for frequent face-to-face contact with physicians than will younger patients. Health care systems will prepare for these major changes by engaging in long-term strategic planning that will ensure the availability and access of health care for the aging population.</p>	
3. Demographics: Generation X	Current View	2025 Projected View
	Generation X have become major health care consumers.	Generation X begin to enter the > 60-year-old population.
	<p>In 2025, Generation X will be between 45 and 60 years of age. While no dramatic change in basic health care needs within this age group was expected, it was not yet clear to participants in <i>S/2025</i> listening activities how the health behaviors and preferences of Generation X will affect the health care system. However, it was apparent that this generation, in general, is accustomed to recent advances in health care information technology, and is generally comfortable with a consumer-oriented rather than patient-oriented approach to obtaining health care. For example, individuals in Generation X were expected to increasingly prioritize convenience and cost when making decisions about their health care.</p> <p>Participants in the listening activities suggested that physicians of Generation X will require ongoing professional development to lead and adapt to major changes in health care and the medical education continuum.</p>	
4. Demographics: Millennials	Current View	2025 Projected View
	Millennials are becoming independent health care consumers.	Millennials have become major health care consumers.
	<p>In 2025, Millennials will be between approximately 25 and 45 years of age. This generation—which will comprise more than half of the workforce in the United States—will supply most of the health care professionals entering practice. Participants in the listening activities felt that the medical education continuum will need to prepare an increasingly diverse group of learners to promote a physician workforce that resembles the US population. Millennials possess computer and other technological awareness, adaptivity, and skills to a degree that is unprecedented in previous generations. Their proficiency in these areas was expected to facilitate rapid technological changes in health care and education.</p> <p>Health systems were projected to adjust health care delivery to suit the behaviors and preferences of Millennials, which were said to differ from those of preceding generations. Because Millennials prioritize convenience and customization to a greater degree than older generations when making health care decisions, they were also thought to be less likely than their predecessors to seek care from a single source if that source does not offer both convenience and customization. Therefore, health care delivery systems and medical record platforms may need stronger linkages with one another to ensure the continuity and patient-centeredness of health care for this generation.</p>	
5. Racial/Ethnic Diversity	Current View	2025 Projected View
	The US population is becoming more diverse. Racial/ethnic minority groups represent an increasing portion of the US population.	The US population continues to become more diverse. Racial/ethnic minority groups represent an increasing portion of the US population.
	<p>Continuing a steady trend, racial and ethnic minority groups will represent an increasing portion of the US population in 2025. While it will not be until the mid-21st century that there is no racial or ethnic majority group in the United States, participants in the <i>S/2025</i> listening activities agreed that all health care professionals in 2025 must be educated to address the needs of patients from a variety of backgrounds. Health care professionals must be able to provide effective care that recognizes the specific social values and realities of patients, families, and communities. As described in #4 above, the medical education continuum will need to prepare an increasingly diverse group of learners to meet the needs of the US population. Efforts to educate a physician workforce that includes residents from diverse racial and ethnic backgrounds were viewed by participants in the listening activities as beneficial to advancing culturally competent health care, to addressing social determinants of health, and to reducing disparities in health care among racial or ethnic groups.</p>	

6. Patient Contact With Health Care Professionals	Current View	2025 Projected View
	Patients value physicians as primary points of contact for their health care.	While patients continue to value physicians, they expect less direct contact with them than in the previous decade. Other health care professionals and automated resources increasingly serve as points of contact for their health care.
<p>Many patients feel a meaningful connection to their physicians, and rely on them as primary points of contact for their health care. While patients and physicians were expected to continue to establish and maintain such relationships, they will generally have less face-to-face, direct contact with one another in 2025, as other health care professionals and automated resources increasingly serve as points of contact.</p> <p>This shift in responsibilities for communication was thought to correspond with a movement toward a team-based approach to health care delivery in which a computerized interface serves as part of the team. Functioning as part of inter-professional teams, physicians will be expected to interact with patients both directly and indirectly, increasingly fulfilling some responsibilities for patient care without direct interaction with the patient. Through interprofessional team training, physicians will learn that the physician-patient relationship and effective team communication are not mutually exclusive. Most patients will recognize that access to different members of a well-functioning team—as opposed to exclusive reliance on contact with a physician—is the norm, and does not negatively affect their care.</p> <p>The trend toward a team-based approach was not anticipated to signal a narrowing in the scope of physicians' or other health care professionals' responsibilities for communication, which will not be uniform across all health care settings. Health care professionals will need to acquire interpersonal and communication skills that can be adapted to the contexts in which they work, and to the differing communication styles and expectations of their patients. This will include extensive remote communications (telephonic and Internet-based) between health care team members and their patients.</p>		
7. Public Health Care Quality Information	Current View	2025 Projected View
	Publicly available health care quality information is becoming accessible through consumer-oriented websites. Health care consumers are beginning to use this information.	Publicly available health care quality information is commonplace. Health care consumers routinely use this information.
<p>It was widely understood that websites and other public information sources provide health care consumers with descriptions, ratings, and rankings related to the quality of the health care provided by health care organizations and health care professionals. As a large number of additional information sources join existing resources, participants in <i>SI2025</i> listening activities forecasted that health care consumers' use of this information in their decision-making will become commonplace. This phenomenon was thought to represent an advance in accountability and transparency in the health care sector.</p> <p>While the benefits of patient-facing health care quality information were evident to listening session participants, many individuals found it increasingly apparent that such information has the potential to be conflicting, inaccurate, and/or misleading. As health care consumer data become ubiquitous, patients and families will need to acquire skills in evaluating and applying the information they find online and elsewhere. Consumers will trust some information sources more than others, but it was not clear to the individuals interviewed whether this trust will be founded on an objective analysis. It was expected that health care professionals will provide valuable support to patients and families as they exercise their newfound interpretive abilities. In turn, health care professionals will have new opportunities to learn from the perspective of patients and families as health care consumers.</p> <p>Residents, fellows, and faculty will need to become more familiar with the performance measurement processes that contribute to consumer-facing information. This will not only inform their conversations with patients and families, but also enable them to respond effectively to the factors that determine their own publicly reported performance.</p>		

	Current View	2025 Projected View
8. Big Data	Public and private organizations are beginning to use large data sets of patient information to reveal patterns of individual health care. The insights gathered from this information are beginning to shape the understanding of health care utilization.	It is commonplace for public and private organizations to use large data sets of patient information to reveal patterns of individual health care. The insights gathered from this information are important tools for understanding and predicting health care utilization.
	<p>It was observed that the adoption of electronic health records (EHRs) across health care settings has led to the digitization of health and transactional information that was previously retained only in hard copy. Large health systems were reportedly increasing their efforts to mine and query these digital data sources. In some cases, the analytic insights yielded from these efforts have resulted in standardized care protocols that have the potential to improve health outcomes, increase efficiency, and reduce costs. Few physicians currently have the skills needed to analyze, interpret, or apply the results from such data analyses.</p> <p>By 2025, it was anticipated that the health system will make extensive use of big data analytics by integrating EHR data with information from disparate sources such as social media, wearable and portable medical devices, genomic profiles, and biometric data. These data, processed and transformed into user-friendly, visualizable outputs, were expected to become increasingly utilized tools in the clinical armamentarium. As with early efforts to synthesize data, it was projected that big data analytics will facilitate health care improvement through standardization. In addition to these applications, the predictive power of big data will be harnessed for the prevention of disease and the enhancement of well-being through early identification of health factors and risks. The synthesis of large data sets was expected to enable health systems and health care organizations to provide care with a higher degree of personalization. Due to the high production costs of some aspects of personalized care, it was predicted that some personalized services will not be affordable for some consumers.</p> <p>Participants in the listening activities thought the input of health care professionals will be crucial in the development of big data analysis tools to ensure that their design and application will promote safe and effective patient care. It was expected that a small but growing number of physicians will complete formal study of health informatics to participate in research and development of big data systems. While relatively few physicians will participate in the technical aspects of big data development, most physicians will be expected to be familiar with the information architectures that produce analytic outputs to understand their applications to patient care. Individuals interviewed speculated that health care professionals will confront emerging health care disparities that result from differences in patient access to the benefits of big data analytics. It was thought that new ethical issues will arise as the use of big data, particularly if it conflicts with established medical practice.</p> <p>It was thought to be likely that large health care corporations and specialized facilities with significant research capacity will be the primary users of big data insights. Health care entities that have the ability to invest the resources necessary to overcome technical, operational, legal, and other hurdles were expected to determine that long-term returns on their investments will outweigh these short-term challenges. Small, community-based, and/or rural health care facilities were thought to be less likely to have the financial and technical resources to commit to the development of big data projects, but will be able to learn from projects completed elsewhere.</p>	
9. Patient Access to Their Own Health Care Data	Current View	2025 Projected View
	Patients have access to some of their health information through patient portals.	Patients actively manage their own health information, which is increasingly portable.
<p>With the adoption and development of the EHR, participants in the listening sessions reported that patients increasingly have access to their health information through online patient portals maintained by health systems. It was noted that the information that is visible to patients does not always represent their complete health record; nonetheless, patients were said to be developing greater familiarity and knowledge with respect to their own medical information.</p> <p>Participants in the listening activities predicted that in 2025, patients will have access to more complete information about their personal health, and in general, will take greater responsibility for managing their own health information. It follows from this prediction that there will be growing demand—led by Millennials, who will be less likely to receive care from a single health system—for portable health records drawn from the EHRs of 1 or more health care facilities.</p> <p>It was expected that health care professionals will care for patients who generally have greater knowledge of their own status and health conditions than patients of the past, but there will be wide variability in patients' understanding and sense of ownership related to their medical records. Patients' roles within health care teams were anticipated to reflect this variability; in their work, teams will need to engage patients with all levels of understanding, and will address gaps in their understanding through education. The increasingly portable health record will provide new support in patient encounters, improving the fidelity and completeness of some aspects of care, such as history taking and physical examination.</p> <p>Some health systems will perceive value in a patient-centered approach to the health record, if it ultimately increases the amount of data available for use in patient care and population health management. Physicians and other health care providers will be increasingly expected to be comfortable with patients having complete access to all aspects of their own health information.</p>		

II. Changes in Health Care Delivery

	Current View	2025 Projected View
	The physician is the leader of the health care team.	The physician participates in the health care team in various roles: frequently as the leader, and often as a coordinator or consultant to other health care professionals. Artificial intelligence-assisted diagnostic, management, and care coordination technology is a central "member" of the health care team.
10. Physicians and Health Care Teams	<p>It was widely accepted that interprofessional health care teams have the ability to provide high-quality, efficient health care by utilizing team members' complementary skills and knowledge, and by ensuring effective communication in their collaboration. Currently, physicians frequently lead interprofessional health care teams and often oversee the performance of other team members. It was reported that these teams are sometimes easily identifiable; and that at other times, they are not formally constructed and team members are difficult to identify. Physicians' team leadership skills were reported to be variable, and some physicians have not received training related to their team leadership roles. Other health care professionals also assume leadership roles in care coordination and other team functions, and leadership training is increasingly emphasized as part of their formal education. Participants in the listening sessions noted that EHRs have begun to support health care teams by facilitating standardized practices such as order sets and patient care protocols.</p> <p>It was expected that in 2025, there will be a shared understanding among health care professions that team members' leadership skills are essential determinants of the success of health care teams. Changes to health care delivery, health care professionals' scope of practice, and technology will have altered the previous structures of teams and the roles and responsibilities of their members. Individuals interviewed thought that artificial intelligence-assisted diagnostic, management, and care coordination technology will engage in team-based patient care with a high level of sophistication, meriting recognition as an interprofessional team member. It was anticipated that information technology will facilitate the identification of patient care teams and their members at all times. With additional technological support and enhanced educational experiences, other health care professionals will have opportunities to assume new responsibilities for leadership and oversight within the team. Participants in the listening sessions thought there will be increasing overlap between the leadership skill sets of physicians and those of other health care professionals. Physicians, who continue to serve in team leadership roles, were also expected to serve as consultants to teams, and will work with other team members to coordinate care.</p> <p>It was predicted that the alignment of health care professions in their understanding and promotion of team leadership will provide new opportunities for common leadership training for all health care professionals. Continuing medical education will include team leadership training for physicians already in practice, to allow them to build and improve their team leadership skills. As part of their leadership responsibilities, it was predicted that health care professionals will integrate and oversee the contributions of technological supports (including artificial intelligence) to the work of teams.</p>	

	Current View	2025 Projected View
11. Retail Health Care	<p>Patients access health care through pharmacies, big-box stores, and freestanding emergency care centers. These facilities are able to provide preventive care and to address minor urgent needs.</p>	<p>Patients increasingly access health care through pharmacies, big-box stores, freestanding emergency centers, and other, newly emerged retail outlets. These facilities have expanded their basic acute and preventive care services to include more comprehensive health care services such as chronic disease management (eg, asthma, hypertension, and congestive heart failure) and minor surgical procedures.</p>
	<p>According to participants in the <i>S12025</i> listening activities, patients access their health care from an increasing variety of sources. Recently, commercial health care providers—including pharmacies, large retailers, and urgent care centers—have successfully developed their capacity to provide a broad spectrum of clinical care, including preventive care, complex chronic care management, and services that address urgent health care needs.</p> <p>In the coming years, it was projected that additional retailers will enter the marketplace to meet a growing demand for convenient and inexpensive health care and preventive services. New and existing commercial health care providers will have expanded their basic acute and preventive care services to include more comprehensive health care services for chronic disease management (eg, asthma, hypertension, and congestive heart failure) and minor surgical procedures. These providers will compete with the outpatient services provided by physicians in private practice, hospitals, health systems, and health care organizations. While it was thought that physicians are likely to be involved as consultants in the design of patient care in retail outlets, it was also thought to be likely that the majority of care in these settings will be provided by other health care professionals.</p> <p>It was expected that health care consumers will choose from a larger number of provider options, and will compare the price and quality of particular services when making their selections. As a result, the average patient will receive their health care from a larger number of sources than they did in the past. Patients will share responsibility for maintaining their health records to ensure that important information is not lost as they move between encounters with different health care providers.</p> <p>While it was assumed that EHRs will have greater communication functionality, health care professionals expect that it will be challenging to ensure the integrity and completeness of medical records as well as continuity of patient care, as care is fragmented among a larger number of providers. It was felt that health care professionals will need to remain cognizant of critical pathways to ensure that all components of care have been provided; thus, they will rely on patients to fill gaps in their medical histories when there is no information in the EHR about care provided outside of a given health system. To ensure the quality and safety of patient care, the education of physicians must inculcate an understanding of the distribution and types of services provided by retailers, even if physicians will not directly provide such services as part of their practice.</p>	
12. Hierarchy of Health Care Teams	<p>Health care teams are often hierarchical in that they are designed to support the physician's leadership in clinical care.</p>	<p>It is increasingly common for health care teams to be nonhierarchical. Health care team members assume leadership roles in different aspects of health care encounters.</p>
	<p>As described in #10 above, leadership roles in interprofessional teams will be increasingly shared between physicians and other health care professionals. This change and others were expected to bring about a new conception of teams as the traditional vertical and hierarchical organization of the team gives way to nonhierarchical, horizontal structures.</p> <p>It was predicted that other health care professions will diversify their scope of practice, and that other health care professionals will take advantage of incentives for practicing in highly skilled positions. As a result, interprofessional teams will have a greater number of members who are competent to complete a larger set of patient care tasks independently. It was foreseen that enhanced team skills and organization will increase the potential for team productivity, which will in turn allow teams to safely care for a higher volume of patients.</p> <p>The development of oral and written communication skills—as demonstrated in activities such as patient rounds and medical record documentation—were expected to take on renewed importance as more aspects of a given patient's health care are delivered asynchronously and outside of a vertical oversight structure. In clinical learning environments, there will be additional opportunities for interprofessional learning, as there will be more purposeful alignment of tasks and skills with particular health care professions and professionals.</p> <p>Physicians will be expected to maintain an in-depth understanding of interprofessional team members' roles and responsibilities to ensure effective team functioning. Ongoing professional development will be necessary to promote new, collaborative team cultures and to address residual behaviors that create obstacles for well-functioning teams. Physicians may also need to prepare for workload changes resulting from increased team productivity, which may introduce opportunities for work flexibility or further specialization.</p>	

13. Medical Knowledge and Standardization of Clinical Care	Current View	2025 Projected View
	<p>Patient care is usually guided by physicians' acquired knowledge and their experience in diagnosis and health care management.</p>	<p>Patient care is usually guided by clinical care pathways and structured, standardized care plans that are enhanced by artificial intelligence–assisted information technology.</p>
<p>Physicians' application of their own medical knowledge, scholarship, and experience have long provided the framework for the diagnosis, treatment, and management of disease and health conditions. In recent times, this traditional model has been augmented by the introduction of care pathways and other standardized processes that are based on the accumulated knowledge and experience of the profession and updated according to new evidence provided by ongoing scientific research.</p> <p>It was anticipated that in 2025, patient care provided by physicians will continue to rely on their acquisition, retention, and understanding of a body of medical knowledge. At the same time, physicians and other health care professionals will increasingly benefit from ready-made guidance provided by standardized, evidence-based health care processes, enhanced by information technology that uses new inputs and experience to learn and improve over time. It was predicted that standardized processes will increasingly incorporate complex algorithms that adapt care plans to the needs and conditions of individual patients. In the early stages of their development, these new clinical tools will not always be intuitive, failsafe, or error-proof. Nonetheless, health care corporations will invest heavily in implementing and refining new processes that promise to increase productivity and efficiency, while responding adequately to patient needs and removing clinical variation that is not evidence-based and adds no value. Whereas these tools were often considered to be optional at the present time, their use was expected to be increasingly compulsory in 2025.</p> <p>It was thought that a small number of physicians will participate in the development of artificial intelligence–assisted information technology. Their work will affect practicing physicians and other health care professionals by enabling a reorientation of clinical resource allocation, particularly as health care corporations bring information technology to bear in moving toward a service line model for health care delivery.</p> <p>Residents, fellows, and junior faculty members with strong technical skills were thought to be well positioned to lead this transformation in health care, and to play an important role in educating their peers and more senior faculty members in the application of standardized clinical tools. In turn, it was expected that the medical education continuum will recognize the teaching roles of technologically proficient physicians and other individuals as new processes and standards are implemented. Participants in the listening sessions expected that resident and fellow education will find new educational methods and practices that balance the acquisition of medical knowledge with the development of critical thinking and problem-solving skills that will be necessary to address the limitations and errors of inchoate models for delivering care.</p>		

III. Evolution in Health Care Systems

	Current View	2025 Projected View
	<p>Although the Affordable Care Act (ACA) has reduced the number of uninsured patients, health insurance coverage has introduced large copayments and deductibles to maintain the affordability of catastrophic care. Numerous populations are adversely affected by disparities in health care based on accessibility, social determinants of health, and other factors.</p>	<p>US health care financing policy continues to evolve. Some of the US population remains uninsured. Health insurance coverage has higher copayments and deductibles to maintain the affordability of catastrophic care. There are persistent disparities in health care that adversely affect numerous populations based on accessibility, social determinants of health, and other factors.</p>
14. Health Care Financing and Disparities	<p>Between now and 2025, persistent health care disparities will adversely influence a number of populations based on social determinants of health (eg, race, social class, sex), health care affordability and accessibility, geography, and other factors. Additional longstanding and substantial disparities were expected continue to exist for patients with certain medical conditions, such as those who suffer from severe, persistent mental illness. Throughout this 9-year period, these intractable disparities were located in the presumed context of a US health care system that requires patients—with or without health insurance—to bear substantial out-of-pocket responsibility for their health care costs. It was anticipated that in 2025, patients and their families will continue to make health care decisions that are complicated by cost considerations. Some organizations and health care professionals were expected to attempt to address disparities by studying public health needs and developing community-based health resources. Health systems and retail outlets will offer an expanding range of services—including preventive health and chronic disease management—at competitive costs. Home-based care and telemedicine were considered to be increasingly popular health care delivery methods that have the potential to improve patient access. It was thought that some patients will place strong emphasis on convenience and cost in making their health care decisions, which may lead to a preference for episodic health care encounters with different health care providers, increasingly without direct contact with a physician. In this view of the future, some patients and families will be empowered to choose from a greater number of health care options. To successfully exercise this power in an increasingly complex health care system, patients and families will need to attain a certain level of health care literacy.</p> <p>It was predicted that the majority of physicians in 2025 will not practice in community-based clinics, home-based care practices, or retail health care settings. Yet to fulfill their ethical commitment to improving patients' overall health, all physicians will need to understand these venues as part of the full range of health care services that their patients access. Physicians and other health care professionals must be prepared to involve patients as health care team members to ensure the coordination of high-quality and cost-efficient care. This teamwork includes health care professionals' ability to educate and engage patients and families in making health care decisions.</p> <p>Participants in the listening sessions also thought that physicians will also need to be able to assimilate patient information from multiple sources, to ensure continuity of care. In doing so, they will need to be able to identify systems errors and to participate effectively in systems improvement processes. Physicians who are skilled in applying insights from aggregated data and/or data analytics were expected to have a competitive advantage for employment for some positions in health systems and health care organizations over those who do not possess these skills. Physicians will need to know how to apply insights from an increasing amount of health care data to reduce health care disparities in the populations they serve.</p> <p>It was thought that physicians and other health care professionals will need to have the knowledge and communication skills to guide patients and families of all health care literacy levels in making informed decisions that incorporate considerations of ethics, costs, risks, and benefits. Participants in the listening sessions also thought that physicians will need to be able to provide appropriate guidance with respect to their patients' use of health care technology. When health care is provided remotely, some physicians will play important supervisory and educational roles to ensure patient safety. It was thought that Sponsoring Institutions are responsible for preparing physicians in all specialties who are able to employ a systems-based approach to providing equitable and cost-efficient health care. The skills associated with this competency should be adaptable to a variety of settings and roles.</p>	

15. Acute Care	Current View	2025 Projected View
	Acute care is centered on an emergency care and inpatient model, and follow-up care is managed through outpatient visits.	Acute care follows a care continuum model that, in addition to emergency and inpatient care, includes acute rehabilitation and follow-up care, often provided remotely.
	<p>Parallel to general changes to the clinical goals and duration of hospitalization in the United States, the model for acute care has begun to emphasize a care continuum. Traditionally, acute care has followed an emergency care and inpatient model; chronic disease management and/or recovery from surgical procedures has been managed through outpatient visits. Between now and 2025, it was expected that hospitals, health systems, and health care organizations will increasingly make efforts to minimize the lengths of inpatient stays and to provide for a mix of ambulatory, home-based, and remote follow-up with a range of interprofessional health care team members.</p> <p>It was anticipated that physicians and other health care professionals will increasingly assume a variety of responsibilities along the care continuum in the emerging acute care model. By 2025, physicians are expected to be accountable for providing efficient care in collaboration with other interprofessional team members. In addition to their direct participation in patient care, some physicians will serve in an educational and supervisory capacity related to health care that is provided remotely.</p> <p>The present prevailing model for graduate medical education (GME) in the view of the listening session participants has not anticipated these changes to the health care system. Most ACGME-accredited programs adhere to a dichotomized inpatient/outpatient structure that mimics the traditional acute care model. Few accredited programs offer substantial, structured educational experiences in home- or community-based care, telemedicine, or telehealth. It was predicted that mechanisms for financing GME will continue to limit Sponsoring Institutions' (SIs') ability to provide educational experiences outside of their participating sites' inpatient and clinic services.</p> <p>Session participants thought that SIs have a responsibility to prepare physicians who are able to collaborate in interprofessional teams along the continuum of acute care, as appropriate. SIs are also expected to play a role in fostering the development of physicians' communication skills in an emerging care model that reduces the time physicians spend with patients and increases team interactions.</p>	
16. Health System Mergers	Current View	2025 Projected View
	Hospitals and health systems are beginning to merge into larger nonprofit and for-profit health care organizations.	A small number of large health care organizations will oversee the health care of an increasing proportion of the US population.
	<p>In 2016, a number of hospitals and other health care facilities were reported to be consolidating with other hospitals and health care facilities through mergers and acquisitions. These transactions furthered a trend toward consolidation represented in the creation of health systems and other health care organizations at local, regional, super-regional, and national levels. Listening session participants thought that in 2025, a small number of large, consolidated health care corporations will oversee the health care of an increasing portion of the US population. Because the operational and financial benefits derived from economies of scale are the <i>raison d'être</i> of large health systems, GME that occurs within these organizations will be expected to contribute to systems that improve productivity and efficiency.</p> <p>These large health care organizations were expected to increasingly engage in workforce planning (including their physician workforce) as part of their long-range strategic planning efforts. The medical education continuum and other health care professional education models will be increasingly viewed by some health systems and organizations as critical pipelines that must be accessed to achieve organizational missions and goals. Over time, health care corporations will exercise a higher degree of authority and responsibility for educating physicians and other health care professionals. Some health care systems and organizations may determine that the costs of GME do not justify its potential benefits. In general, listening session participants agreed that a SI's GME activities—including those of its leaders, educators, and residents/fellows—will increasingly need to demonstrate a return on corporate investment in the education of physicians as it applies to patient care goals. It was predicted that health systems will incentivize their trainees to become employees upon completion of their training; in turn, employment within a health system or health care organization will appeal to an increasing number of physicians and other health care professionals.</p> <p>The tendency toward consolidation challenges traditional conceptions of the SI and its participating sites; it also raises questions about defining and measuring adequate oversight of GME in a large and complex—or in a small and geographically diffuse—SI. There were serious concerns that centralized, "hub and spokes" health system models will disadvantage patients who cannot access services due to geography, mobility, transportation access, and other factors. Similarly, it was not clear to listening session participants to what degree corporate workforce planning efforts, which will exert increasing influence over provider mix and distribution in the United States, are designed to meet the health care needs of the public.</p>	

17. Health Care Payment and Delivery Models	Current View	2025 Projected View
	Health care is structured in specialty-based departments/divisions and financed by a blend of payers and payment models. Fee-for-service is the most common payment model.	Health care structure is increasingly based on the service line and the delivery model. Bundled, global, and capitated payments within the context of pay-for-performance are increasingly the most common forms of financing care.
	<p>Listening session participants thought that health care will continue to be financed by a mix of payers, including federal, state and local governments, insurers, and health care consumers. The fee-for-service payment model will continue to be common in health care, which will be compatible with continuation of present-day professional demarcations of department, division, and subspecialty in organized medicine.</p> <p>At the same time, it was predicted that changes to health care delivery and payment systems will require physicians to assume increasing financial accountability for the quality and efficiency of the care they provide based on performance metrics, including patient care outcomes. Increasingly, health care service delivery will be designed around service lines, rendering some traditional specialty and subspecialty distinctions less significant. It was anticipated that patient-centered medical homes and accountable care organizations will increasingly become a model for promoting healthy communities while restraining the overall growth of health care costs. All of these phenomena were expected to encourage continued experimentation with and implementation of other payment methods and systems, including the next generation of trials of pay-for-performance incentives and bundled and capitated payment systems.</p> <p>Physicians in 2025 will need to be prepared for the potential impact that alternative payment systems may have on the way they practice medicine. In assuming greater personal financial accountability for the care they provide, physicians will have new incentives to learn about and improve their contributions to a patient's ongoing or overall health. Many physicians with academic roles will need to develop professional skills that allow them to function effectively in university departments and divisions as well as in the employment context of a health system service line. Bundled and capitated payment models will also reinforce the importance of interdisciplinary and interprofessional teamwork in the delivery of care.</p> <p>To prepare for these changes, residents and fellows will be expected to gain an experiential understanding of the interdependence of clinical performance measurement, interprofessional teamwork, and health care payment systems. The engagement of residents and fellows in continuous quality improvement activities will furnish them with skills that will be increasingly desirable in health care payment models that depart from the fee-for-service standard.</p>	
18. Health Systems and Population Health	Current View	2025 Projected View
	Health systems are using aggregated patient data to measure the safety and value of health care, and are beginning to use these data to guide population health management.	Health systems are proficient in their use of aggregated patient data (including big data) to improve the safety and value of health care as well as to manage population health.
	<p>As described above (#8), health care organizations will increasingly use large sets of patient care and transactional (eg, medical billing) data to measure the quality, safety, and value of health care. In some cases, these efforts will result in improvement in medical care protocols that has the potential to improve health outcomes, increase efficiency, and reduce costs. In the process of expanding their services and locations, large health systems were reported to be acquiring ever-growing reservoirs of information about individual patients that they can be analyze to gain health insights about individuals and populations. For most health systems, such analysis appears to be new and internal organizational resources for such patient care analysis appear to be emerging.</p> <p>By 2025, it was predicted that many organizations will become proficient in using some of their aggregated patient data—including big data—to improve the quality, safety, and value of health care. Health care professionals in these organizations will need to attain various skill levels in data analysis, and as a result, will have different types of responsibilities for data ranging from architect to end user. It was expected that a small—yet increasing—number of health care organizations will extensively deploy big data analytic tools that use algorithms and/or machine learning to develop highly complex standardized care processes and recommendations. These tools were expected to have the capacity to identify areas for improvement in delivering and overseeing health care in specific populations. Ongoing education and discussion of ethical concerns will be needed to address uses and limitations of analytic insights in population health management. The introduction of big data analysis was expected to impact all members of the interprofessional team, and will increase a sense of common accountability for patients' health and clinical outcomes.</p> <p>The use of data to improve population health was not considered an established skill set for many physicians, residents, or fellows. Residents and fellows were born in the computer age and were considered "digital natives" who are receptive and adaptive to information technology in health care. Yet, presently there are still many providers (including faculty) who have differing comfort levels with computer-based medical care. There is an identified need for shared learning to develop a common understanding of all interprofessional team members' relationship to and responsibility for data. SIs were thought to have an emerging responsibility to align institutional data practices with appropriate skills development among faculty, residents/fellows, other interprofessional team members, and other learners. By 2025, the overwhelming majority of providers will be "digital natives," and therefore it was anticipated that there will be broad acceptance of an extensive and nearly comprehensive computer-based practice of medicine. In this context, SIs will need to ensure that faculty members, residents/fellows, and others are competent to identify and address ethical and/or professional concerns when using patient data in population health management and other activities.</p>	

19. Health Care Professionals and Population Health	Current View	2025 Projected View
	Physicians and other health care professionals are beginning to use aggregated patient data to measure the safety and value of health care and infrequently apply population health data to their own practice.	Physicians and other health care professionals routinely use aggregated patient data to measure the safety and value of health care and apply population health data to their own practice.
<p>As described in Findings #8 and #18, a number of health care facilities are developing their abilities to use health care data to improve the quality and safety of patient care as well as to increase health care value. While residents and fellows are reported to be variably engaged in applying population health data to their own practice, it was also reported that they are increasingly likely upon entering practice to be held accountable for meeting common clinical performance targets that are measured in the aggregate. Health care professionals today widely view EHRs as burdensome and/or unsuitable in the extraction and manipulation of data for educational and clinical purposes.</p> <p>In the coming years, EHR vendors were expected to make progress in addressing software limitations that impede health care professionals' use of data. Physicians and other health care professionals in 2025 will routinely use aggregated data to improve their own practice in recognition of organizational, professional, and self-defined expectations. Participants in the listening sessions thought that physicians will increasingly use data to oversee standardized care protocols, to inform care planning with analyses of risks and benefits, and to enhance personalized quality improvement activities. Physicians were also expected to play an important role in identifying and addressing system errors and problems associated with the analysis of patient data.</p> <p>It was thought that in 2025, it will be essential for SIs to take an active role in ensuring the deployment of data and analytical tools to residents/fellows and faculty members so to ensure data availability and user-friendliness. SIs should prepare residents/fellows for their likely future accountability for using data to achieve individual, team, and organizational performance goals.</p>		
20. Bundling and Commoditization of Health Care Services	Current View	2025 Projected View
	Certain health care services are beginning to be bundled (eg, knee replacements, valve replacements). Some aspects of health care are commoditized.	An increasing number of health care services are bundled and/or commoditized.
<p>At present, pre-, peri-, and postoperative services related to some types of surgical procedures have been bundled for global or capitated payment. This phenomenon has led to shared operational and financial accountability in health care teams and organizations, strengthening organizational identity as perceived by health care providers, patients, and families. At the same time, insured and uninsured patients and families have a growing need for consumer decision-making power to manage the increases to their out-of-pocket health care costs. As a result, certain patients, as consumers of health care services were reported to increasingly search for value in their health care, especially as related to procedures. While hospitals, health systems, and physicians commonly seek to differentiate themselves by quality, patients increasingly differentiate health care choices by cost. It was not uncommon for patients to perceive some health care services as commodities that can be distinguished by brand and organization.</p> <p>Over the coming years, it was anticipated that an increasing number of health care services will be combined for payment, and will increasingly appear as commodities in a health care marketplace. Among these various types of services will be boutique or elective health care as well as patient-centered, comprehensive approaches to basic health needs. There was a perceived potential for disparate health care to be provided to patients who find themselves vulnerable in the health care market due to a lack of financial resources or health care literacy.</p> <p>Bundled and/or commoditized services were thought to require complex patient management and, therefore, highly performing interprofessional team members who take responsibility for the continuum of care. Consequently, some team members likely will have a greater stake in care provided to their patients, even when they are not physically present. To function effectively, teams must sometimes communicate asynchronously or via electronic media.</p> <p>It was thought that some health care professionals, patients, and families will appreciate the simplicity of bundled or capitated payment models for health care services. This simplicity will not absolve health care professionals from their responsibility to attend to dimensions of ethics, finances, and quality in changes to payment models. Participants in the listening sessions thought that health care professionals may also find the simplicity to be deceptive as they assume responsibility for complex communications with team members who are not immediately or physically present for some care decisions or episodes of care.</p> <p>In 2025, SIs will need to ensure that residents/fellows and faculty attain an appropriate understanding of health care payment models and their impact of patient decision-making to best assist their patients in making health care choices and to reduce health care disparities. SIs will also need to ensure that residents/fellows are competent in communicating with other providers, patients, and families asynchronously and/or electronically.</p>		

		Current View	2025 Projected View
21. Strategic Planning		Hospitals use informal, short-term (< 5 years) market or budget analyses to engage in workforce planning.	Large health care organizations develop long-term (> 5 years) strategic workforce goals and align physician training and recruitment with those goals.
		<p>Most organizations involved in health care reportedly engage in short-term operational and business planning, and many have adopted formalized processes for long-term strategic planning. Short-term planning efforts rely heavily on market and budget analyses; such efforts may include workforce planning of a primarily tactical nature. Strategic planning relates anticipated or ongoing organizational activities to specific organizational missions and goals, and often prioritizes the cultivation of a workforce that shares those missions and goals.</p> <p>In the coming years, it was expected that additional health care and education organizations will devote substantial resources to strategic planning efforts to guide purposeful expenditure on health care and educational projects. The growth of strategic planning will likely be accelerated by the consolidation of health care organizations through mergers, acquisitions, and other transactions. At present, as in 2025, the US federal government likely will not require health care and education organizations to participate in specific workforce development activities. In the absence of national governmental intervention in workforce planning, business priorities as reflected in operational and strategic plans were anticipated to be the major drivers of health care workforce trends in the United States. The continuum of medical education and education in other health care professions were predicted to be influenced by the increasing interest in and intensity of these strategic planning efforts within health care and education organizations. Health care organizations will increasingly regard educational programs as business units, as either an asset or liability in the context of their strategic plans. Organizations will make decisions to create, alter, and eliminate educational programs based on their contribution to organizational missions and goals, and specifically to their financial goals</p> <p>In 2025, SIs will need to be explicit and transparent about the mission-related and financially driven relationships between GME and specific strategic and operational plans for their clinical learning environments. Designated Institutional Officials (DIOs), Institutional Coordinators, and other GME administrators will continue to be important leaders of the educational mission, and will need to formulate educational goals in terms of the strategic and business interests of the health care organizations in which they function. Thus, SIs will need to provide adequate support to enable GME leaders to fulfill educational leadership roles.</p>	
IV. Evolution in the Role of the Physician			
22. Cost-Efficient Health Care		Current View	2025 Projected View
		Physicians are modestly familiar with cost-efficient health care.	Physicians are increasingly evaluated on their ability to provide efficient and cost-efficient health care.
		<p>Many health care organizations, health care professionals, patients, and families have reportedly prioritized cost control (at least in terms of patient out-of-pocket spending) into their health care decision-making. The imperative to contain costs has led physicians to become modestly familiar with principles and practices associated with cost-efficient health care. Health care financing methods—such as the value-based purchasing, bundled payments, and alternative payment models associated with accountable care organizations—have reinforced the importance of cost consciousness in health care. Patients and families, who are responsible for paying increasing out-of-pocket health care costs, were thought to prefer to receive care from health care professionals who can assist them with minimizing their expenses, and who do not subject them to unnecessary and/or expensive tests or procedures.</p> <p>By 2025, patients were expected to increasingly evaluate their physicians and the sites of their health care on their ability to provide cost-efficient health care. Transparency in the marketplace was expected to allow patients and their families to be better informed when comparing the cost of health care among various providers.</p> <p>Physicians' success in this domain depends largely on the extent to which they can effectively fulfill their roles in the continuum of care and optimize their understanding of health care financial systems. Because this understanding is applied in different situations and circumstances, physicians' skills in this area were said to be acquired informally and refined experientially. By 2025, it will be important for health care providers and organizations to centralize their efforts to teach core principles of cost-conscious practice to health care professionals and learners. To varying degrees, health care organizations were expected to be more explicit and transparent in communicating the costs associated with various services to health care professionals, patients, and families.</p> <p>It was thought that SIs will need to assume a greater role in educating residents/fellows about the role of value in health care decision-making. To advance education in this area, SIs will likely partner with health care organizations to ensure that health care professionals, learners, patients, and families receive adequate information to make health care value judgments.</p>	

23. Work-Life Balance	Current View	2025 Projected View
	The majority of the physician workforce interprets the physician's profession to include a high degree of self-sacrifice to family, friends, and community.	The majority of the physician workforce interprets the physician's profession to include the provision of high-quality health care in balance with relationships to family, friends, and community.
	<p>Self-sacrifice was considered to be an essential attribute of physicians' professional identity in the United States. The present expectation is that physicians will most often subordinate their self-interest in fulfillment of professional duties.</p> <p>Approaching 2025, listening session participants identified a number of changes that may contribute an evolving definition of <i>work-life balance</i> for physicians. Shifts in generational demographics will be accompanied by changing career expectations among physicians entering the profession. In particular, participants in the listening sessions thought that Millennials may not dichotomize work and life like older generations of physicians, and thus may view professional success as a balance of self-sacrifice weighed heavily in light of personal relationships or the pursuit of other interests. Physicians of 2025 were thought to be more likely than those in the current system to be employed by a health care organization than to be self-employed, which may prompt other changes to professional identity. The increasing distribution of tasks among interprofessional team members allows for additional delegation of clinical work that could be completed by multiple individuals on the team. Given these coinciding trends, the prevailing definition of work-life balance for physicians in 2025 will integrate professional dedication with flexibility of lifestyle.</p> <p>It was not yet clear how physicians' professional expectations in 2025 will find alignment with the operational realities of SIs. If there are no changes in work demands for physicians, increasing clinical productivity expectations will be accompanied by greater time compression of physician tasks. It was thought to be important for SIs in 2025 to ensure that faculty, residents, and fellows are able to recognize and address burnout and other well-being issues related to work-life balance in the context of clinical learning environments in 2025.</p>	
24. Physician Employment	Current View	2025 Projected View
	An increasing share of the physician workforce is employed by health systems.	Almost all physicians are employed by health systems and health care organizations. Few physicians remain in private practice and even fewer seek to establish new private practices due to operational complexity.
	<p>As described in Finding #16, as health care organizations continue to merge or be acquired, there will be a smaller number of large health care organizations that will oversee the health care of an increasingly large number of US patients in 2025. Health systems and other health care organizations were expected to employ large numbers of physicians and other health care professionals. In 2025, proportionately fewer physicians were predicted to remain in private practice, and even fewer were predicted to seek to establish new private practices due to operational and fiscal complexity.</p> <p>It was thought that residents and fellows who are employed upon completion of their training will find that they are expected to demonstrate systems-based practice skills that will need to be maintained and developed throughout their professional lives. As employees, physicians will interact frequently with interprofessional teams and team members as co-workers. They will also be required to adapt to changes in standardized business and care processes as established by their employers. Within organizations that educate health care professionals, some physicians will have teaching responsibilities factored into their work effort.</p> <p>It was anticipated that in 2025, physicians who (as employees) will be expected to be interdependent with their colleagues and team members (as co-workers) will face circumstances different from the present-day model, which offers greater autonomy in a private practice model. Physicians may find it challenging to enact and/or manage change within their health care teams, or they might struggle to adapt to rapidly evolving documentation or care processes. The few physicians who remain in private practice—particularly in urban and suburban areas of the United States—are expected to face mounting difficulties doing business in a health care sector that favors consolidation and commodification.</p> <p>It was thought to be important for SIs to prepare residents and fellows to function effectively in their future practice settings. In 2025, this will entail preparing physicians who will be comfortable in the role of employed staff of a health care organization. Health care organizations will be likely to value employed physicians who demonstrate high levels of skill in leadership, communication, and adaptation.</p>	

	Current View	2025 Projected View
	Physicians are testing the use of artificial intelligence to guide health care.	Physicians are increasingly expected to use artificial intelligence to guide health care.
25. Artificial Intelligence	<p>The advent of artificial intelligence in health care would not be possible without big data (see Finding #8). For health care technology to learn—the hallmark characteristic of artificial intelligence—it must have access to massive amounts of information. Much of this has become available with the digitalization of patient care and other information, including that found in EHRs, as well as more general medical knowledge from private and publicly available information sources. It was reported that health care and technology organizations have begun to deploy these data in the development of learning machines.</p> <p>In the current system, health care organizations were said to be investing in the research and development of technologies that utilize artificial intelligence with the expectation that innovations in this area will improve health outcomes, increase efficiency, and reduce costs. Technology that incorporates artificial intelligence usually utilizes natural language processing to assimilate information and to interact with users. Artificial intelligence was thought to have the potential to improve a range of clinical and administrative activities. For example, it could have the ability to quickly connect patient needs with available resources to improve throughput; it could gather and synthesize information to guide treatment plans; and it could compute large quantities of genetic and other information to personalize care.</p> <p>As 2025 approaches, artificial intelligence was expected to increasingly be found among clinical team resources, primarily in the background (eg, decision support) and perhaps in the foreground (eg, assisting in patient care management decisions). Much of the value of artificial intelligence in 2025 was thought to be based on its ability to improve clinical care by analyzing EHR data (including notes and imaging studies) and information from other disparate sources such as social media, wearable and portable medical devices, genomic profiles, and biometric data. As with human efforts to analyze and learn from data, artificial intelligence was anticipated to facilitate health care improvement through standardization and individualization of care processes. Developers were expected to attend closely to the user-friendliness of this technology, which will benefit health care professionals as well as the technology itself, which often relies on human interaction to learn. There were foreseen design challenges for artificial intelligence in the health care sector, as many health care professionals will question the trustworthiness and safety of information that artificial intelligence contributes for use in patient care. It was anticipated that physicians’ trust in these new technological supports will be based on an experiential understanding of the functions and structures of artificial intelligence.</p> <p>During the next decade, it was expected that the input of health care professionals will be crucial in the development of artificial intelligence to ensure that their design and application will promote safe and effective patient care. A small but growing number of physicians will participate in research and development of artificial-intelligence assisted technology and systems. While relatively few physicians will participate in the development of artificial intelligence, most physicians will need to be familiar with the design and appropriate uses of artificial intelligence to understand their applications to patient care. It was predicted that health care professionals will confront emerging health care disparities that result from differences in patient access to the benefits of artificial intelligence. A variety of new ethical issues were expected to arise as the use of artificial intelligence moves further into the realm of established medical practice.</p> <p>Large health care organizations or specialized facilities with significant research capacity likely will be the primary early adopters of artificial intelligence–assisted health care technology. It was thought that small, community-based, and/or rural health care facilities will begin to implement artificial intelligence–assisted health care technology that has demonstrated its effectiveness and affordability elsewhere.</p>	

26. Specialization	Current View	2025 Projected View
	<p>Physician specialties are well demarcated by scope of practice among other physicians.</p>	<p>With the continued emergence of new technologies and evolving health care delivery models, there are increasingly blurred lines between specialties.</p>
<p>The current, accepted process of physician specialization and subspecialization was thought to increasingly undergo challenges that relate to well-demarcated scopes of practice. The role of the generalist physician continues to be challenged by continued resident and fellow interest in advanced subspecialty training. Technological advances have allowed specialists to blur specialty-based practices (eg, vascular and interventional radiology and surgery; interventional cardiology and thoracic surgery). Additionally, the changing models for financing health care (eg, accountable care organizations, bundled payment mechanisms) were reportedly beginning to cause health systems, as employers of physicians, to develop a service line orientation that remodels the care process and the relative roles of physician specialists in the care process. For physicians within universities and other academic organizations, the changing deployment of physician specialties within health systems does not always align with traditional departmental expectations for specialty scope of practice. According to listening session participants, this disjuncture of health care and education organizations' expectations sometimes created friction.</p> <p>As noted above in Finding #17, emerging health care delivery and payment systems—such as bundled or capitated payments and the service line model—will redistribute financial accountability to interprofessional team members and to a range of health care professionals that may span more than 1 clinical department, division, or provider type for grouped payments. It was expected that facilities embracing the concepts of the patient-centered medical home and/or the accountable care organization will continue to demonstrate some success in managing patients' multispecialty care needs while reducing overall health care costs. Taken together, these changes were anticipated to challenge, and likely increasingly to eclipse, traditional specialty and subspecialty distinctions in some clinical settings.</p> <p>There was a continuing concern that the GME process does not reliably produce physicians who are competent to provide some services independently unless they have completed a fellowship or other specialized education prior to entering practice. In 2025, the increasing deployment of interprofessional health care teams in patient care likely will emphasize particular and sometimes narrow skill sets of individual team members. Some physicians may serve as highly specialized consultants to a large number of interprofessional care teams. For these reasons, subspecialization in GME was expected to continue in the coming years. New subspecialties may develop within traditional academic boundaries, or may emerge from interdisciplinary or interprofessional practices.</p> <p>While the process of specialization may not change radically before 2025, physicians will need to be mindful that forces external to the profession will continue to shape the model of organized medicine. It was thought that physicians will benefit from education resulting in the development of common communication and adaptation skills that can be applied in interprofessional and interdisciplinary settings.</p>		

27. Accountability for Faculty With Clinical and Educational Responsibilities	Current View	2025 Projected View
	It is unclear who is responsible and accountable for faculty development of physicians who serve as medical school faculty with clinical and educational responsibilities.	Responsibility and accountability for the faculty development of physicians with clinical and educational responsibilities increasingly rests with health care organizations.
	<p>Currently, faculty development for physicians who serve as medical school faculty reportedly continues its traditional emphasis on the advancement of specialty-based medical knowledge and patient care. These faculty development efforts have tended to be organized within specialty and subspecialty academic communities. Rapid changes in technology and health care delivery have increased the need for faculty development that augments specialty-specific efforts with interdisciplinary, interprofessional activities that target broad, crosscutting topics in health systems science. Many faculty members find themselves responsible for teaching concepts and skills that they themselves did not acquire in medical school, residency, or fellowship training.</p> <p>In environments where medical schools partner with health care facilities to educate students, residents, fellows, and faculty, it was often unclear to listening session participants who is supporting faculty development that advances educational goals while fostering the development of crosscutting professional and interprofessional faculty skills.</p> <p>Over the next decade, as health care and education are affected by health care consolidation (see Finding #16), large health systems and health care organizations were expected to assume increasing responsibility for developing physician skills that are applicable either to their status as employees or to their affiliation as risk-sharing contracted providers. Some large health care organizations will have a strong business interest in training and retaining health care professionals who are able to contribute their skills toward improving the productivity and efficiency of their health care systems. Because many physicians were not explicitly exposed as learners to certain concepts and skills, it was thought that it will become increasingly apparent that successful faculty development must include leadership skills that will foster their and others' adaptation to new educational paradigms. Training opportunities related to these skills will be organized by health systems in collaboration with specialty and subspecialty groups. As health systems increase faculty development at the organizational level, they were expected to assume increasing responsibility and accountability for these activities.</p> <p>In this future, SIs will need to serve an important function in coordinating faculty development related to GME. Successful SIs will increasingly need to be able to define and uphold common standards of professionalism through faculty development efforts. It was thought to be likely that in 2025, medical schools, other academic organizations, and some health systems will continue to emphasize GME faculty development that is primarily organized by specialty and subspecialty. It was predicted that business interests will cause large health care organizations to invest resources in faculty development at the organizational level. In an era of health care consolidation, many SIs will be challenged to assign responsibility and accountability for improving the skills of faculty within their specialties and within organizations.</p>	

	Current View	2025 Projected View
28. Compensation for Faculty With Clinical and Educational Responsibilities	Physicians who serve as medical school faculty with clinical and educational responsibilities receive their salary through a variety of compensation models that utilize medical school and health system resources.	Physicians who serve as medical school faculty with clinical and educational responsibilities receive salary primarily or exclusively from health systems and health care organizations.
	<p>In 2016, it was reported that compensation for physicians who serve as medical school faculty mainly draws on the performance expectations and financial resources of medical schools, hospitals, health systems, and/or other clinical practices, research institutes, and philanthropic sources. In organizations that participate in GME, it was apparent to participants in the listening sessions that educational and/or administrative time and effort of many physicians who serve as medical school faculty are not sufficiently factored into most compensation models. In some cases, most or all faculty compensation depends on clinical productivity expectations; and for most physicians who serve as faculty, little or no compensation is dedicated to educational responsibilities. There was variety and complexity of compensation models that differ between organizations and among physician specialties and subspecialties.</p> <p>Over the next decade, rapid changes in technology and health care delivery were expected to increasingly influence educational resources and needs across the medical education continuum. Many faculty, residents, and fellows find themselves responsible for teaching concepts and skills that they themselves did not acquire in their previous education (eg, health systems science). In most cases, compensation models have reportedly not kept pace with the increasing volume and novelty of educational and administrative responsibilities for which faculty members are explicitly or implicitly responsible.</p> <p>Current conditions of faculty compensation have contributed to perceptions of faculty burnout, work-life imbalance, and other challenges to the well-being of physicians who serve in GME. There was particular concern for those physicians with additional responsibilities as residency/fellowship program directors and DIOs.</p> <p>As health care and education are impacted by health care consolidation in the coming years (see Finding #16), large health systems and health care organizations were expected to assume increasing responsibility for compensation of medical school faculty. Many educational activities within health systems and health care organizations will likely be designed to improve the productivity and efficiency of systems. Whereas the current GME system sometimes views clinical service—including repetitive tasks—as oppositional to educational quality, future education within service lines and interprofessional teams will show the interrelatedness of some forms of service and education. It was thought that academic medical centers and medical schools will likely continue to bear financial responsibility for compensating many medical school faculty, including many with subspecialty expertise who maintain some degree of responsibility for undergraduate medical education, sponsored research, or philanthropic program activities or awards (eg, endowed professorships). In all cases, the health care consolidation process and its associated transactions were predicted to increase demands for transparency and accountability for the financial investment in organizations' educational efforts. If this does not occur, the health care sector will effectively ask society to accept a higher level of risk to the well-being of physician educators and to learners—and, by extension, a higher risk to patients.</p> <p>In 2025, successful SIs will need to demonstrate an essential role in ensuring equitable and transparent mechanisms for determining the compensation of faculty members who have educational and administrative responsibilities related to GME. To conduct this oversight, SIs will likely need to continuously measure financial contributions to program directors' and faculty members' educational efforts. It will be essential for SIs to work with other medical staff leadership to provide input on faculty compensation for GME to administration.</p> <p>It was considered to be likely that the public will call transparency and accountability in many facets of health care financing, which will include organizational funding devoted to faculty corresponding to their duties in GME. Efforts to understand faculty educational and administrative activities—in particular, through a revised understanding of service and education and through recognizing and accounting for experiential learning activities—will need to be reconciled in compensation models for faculty members' responsibilities.</p>	

	Current View	2025 Projected View
29. Medical Literature	Physicians utilize a rapidly expanding body of medical literature and other information to inform their clinical practice.	Physicians rely heavily on their critical thinking skills when selecting, assessing, and applying relevant information from a vast reservoir of medical literature and other information.
	<p>At present, physicians rely on the scientific literature of medicine—specifically, medical texts, journals, and reference resources in print and electronic formats. As the scientific literature changes rapidly and is supplemented by other forms of clinical information, it was thought that physicians will need to develop and maintain skills that enable them to select, assess, and apply information safely and effectively.</p> <p>In 2025, there will likely be a continued proliferation of publishers and medical journals (including smaller, self-published sources), including a rapid increase in the number of online and open-access journals. Physicians sometimes cannot rely on the context of publication history or reputation when assessing information from new publishers or journals.</p> <p>Many physicians supplement their use of medical literature with blogs, podcasts, and other media. Millennials in particular have demonstrated an affinity for medical information delivered through new media, consistent with generational preferences for electronic, self-directed, individualized, and just-in-time learning (see Finding #33).</p> <p>These trends in medical publishing and information were expected to continue undisrupted over the next decade. It was thought that some new medical publishers and medical new media are likely to deviate from a conventional peer-review model. There was concern that in some cases, it will be difficult to discern conflicts and dualities of interests in medical publications or information.</p> <p>It was thought that in 2025, physicians will increasingly need to rely heavily on their critical thinking skills when selecting, assessing, and applying relevant information from a vast Internet-based reservoir of medical literature and other information. The medical education continuum needs to facilitate appropriate skills development in this regard to ensure safe and effective patient care. In the future, successful SIs will need to ensure that faculty, residents, and fellows optimize their ability to use the medical literature effectively. Effective use of medical information may include proficiency with artificial intelligence interfaces that apply a body of global medical scholarship to individual patient care decisions.</p>	

V. Evolution in the Role of Other Health Care Professionals (eg, RNs, NPs, PAs, Clinical Technicians, Pharmacists, Social Workers)

	Current View	2025 Projected View
30. Remote Delivery of Health Care	Health care (including rural health care) is delivered mostly in-person by physicians and “physician extenders.”	Health care (including rural health care) is often delivered at a distance, using remote technology and teams of other health care professionals with physician oversight.
	<p>This report defines “other health care professionals” as nurses, nurse practitioners, physician assistants, pharmacists, technicians, social workers, and others who contribute to clinical care. In the everyday life of health care organizations at present, other health care professionals are often identified as “physician extenders,” “midlevel providers,” and other terms. These commonly used terms define other health care professionals in relation to physicians, reflecting a conception of a health care team in which a physician plays a singular and central role in coordination and oversight of patient care.</p> <p>In clinical care settings that rely on established business models such as office visits and fee-for-service payment systems, many physicians were expected to continue to play this central role. In the coming years, it was anticipated that other clinical care settings will adopt patient-centered team models due to consolidation, alternative payment models, and other marketplace phenomena.</p> <p>In 2025, other health care professionals will continue to diversify in their scopes of practice and levels of specialization. More health care will be provided in communities, retail outlets, and homes, and more care will be delivered remotely. In these care models, more aspects of a given patient’s health care will be delivered asynchronously by interprofessional team members who communicate via electronic means. Consequently, other health care professionals will function with increasing independence in certain episodes of care, while remaining subject to supervision and oversight in many components of care by physicians and other team members.</p> <p>It was predicted that interprofessional health care teams will increasingly be characterized by horizontal structures and virtual and remote team communication. It was also predicted that “physician extenders” and “midlevel providers” will ultimately fall out of use as terms that do not reflect the roles and relationships of many interprofessional team members.</p> <p>Effective patient-centered care coordination in interprofessional teams requires overlapping leadership and communication skill sets in physicians and other team members. In clinical learning environments, there will be additional opportunities for interprofessional learning, as there will be more purposeful alignment of tasks and skills with particular health care professions and professionals. Successful SIs will seek to ensure the development of communication and leadership competencies that physicians will need to function in these new types of physical and virtual practice environments. These competencies will include specific skills that can be applied to emerging health care delivery models that emphasize team functioning, telemedicine, and patient-centered care.</p>	

	Current View	2025 Projected View
	Physicians' roles and responsibilities are well demarcated in contrast with those of other health care professionals.	With the continued emergence of new technologies and the evolution of health care delivery models, there are increasingly blurred lines between physicians' roles and responsibilities and those of other health care professionals.
31. Roles of Other Health Care Professionals	<p>Currently, physician roles and responsibilities are well specified within a system of specialization and subspecialization that is recognized by governmental, licensing and credentialing authorities, health care and education organizations, organized medicine, and the medical education continuum. Other health care professionals function within defined scopes of practice with appropriate levels of clinical supervision and oversight. In the coming years, the emergence of new technologies and the evolution of health care delivery models were expected to prompt changes to interactions, relationships, roles, and responsibilities of various health care professions.</p> <p>Over the next decade, other health care professions were anticipated to continue their efforts to enhance their scope of practice, and many will take advantage of incentives for practicing in highly skilled positions. As the number of highly skilled providers from other health care professions increases, it was expected that new team members (technology-based assistants and virtual members, such as artificial intelligence–assisted technology) will emerge to fulfill new and existing roles and responsibilities. Participants in the listening sessions thought that more aspects of a given patient's health care will be delivered asynchronously by interprofessional team members who communicate via electronic means (see Finding #29). Some tasks were anticipated to be within the scope of practice of providers from more than 1 type of health care profession. As a result, interprofessional teams were expected to be broadly conceptualized and their members will often be competent to complete a larger set of patient care tasks independently (see Finding #6).</p> <p>At the same time, it was thought that subspecialization among some physician specialties and subspecialties will increase due to health care market trends (see Finding #26). Enhanced team skills and organization were expected to increase the potential for team productivity, which will in turn allow teams to safely care for a higher volume of patients. Some physicians will have less direct interaction with patients as other health care providers assume greater responsibility for communication and some aspects of care (see Finding #6). Emerging health care delivery and payment systems—such as bundled or capitated payments, the service line model, and patient-centered medical homes—are expected to emphasize the professional accountability of a range of interprofessional team members for providing high-quality care. All of these changes have the potential to blur lines of roles and responsibilities between health care professionals, including physicians, and to blur the lines of specialization within the profession of medicine.</p> <p>To ensure safe and effective team functioning, governmental and licensing authorities, health care and education organizations, and the medical education continuum will continue to define the respective roles and responsibilities of health care professionals. These stakeholders will likely recognize that health care professionals will need to develop some common leadership, communication, and patient care skills to ensure safe, effective, and patient-centered care.</p> <p>In clinical learning environments, there were expected to be additional opportunities for interprofessional learning as there is more purposeful alignment of tasks and skills with particular health care professions and professionals. In this future, SIs will need to be open to educational experiences shared by different types of learners. Such activities will serve an important role in developing competencies that physicians will need to function effectively in various established and emerging practice environments. These competencies will include specific skills that can be applied to emerging health care delivery models that emphasize team functioning and patient-centered approaches.</p>	

VI. Evolution in Graduate Medical Education

32. Clinical Productivity and Faculty Educational Effort	Current View	2025 Projected View
	<p>Clinical productivity pressures are increasingly marginalizing educational efforts.</p>	<p>Faculty who remain involved in GME are most commonly those whose employers directly support the faculty's GME role. While physicians remain dedicated to teaching, few physicians are able to engage in volunteer teaching due to clinical demands.</p>
<p>It was reported that compensation for physicians who participate in GME currently draws on financial resources from medical schools, hospitals, health systems, and/or other clinical practices and activities. Compensation models vary by organization and among physician specialties and subspecialties. In many cases, health care and education organizations fund faculty through a mixture of health system support, federal, state, and local governmental sources, and philanthropic commitments to support the costs associated with maintaining faculty for GME.</p> <p>In organizations that participate in GME, it was apparent from the listening activities that the educational time and effort of many physicians who serve as medical school faculty are insufficiently factored into many compensation models. It was reported that compensation models for physicians frequently incorporate relative value units (RVUs) corresponding with reimbursement formulas for governmental payments for physician services. It was also reported that compensation models that use RVUs to set clinical productivity expectations generally do not take the same approach to setting educational expectations.</p> <p>It was reported that in some cases, most or all faculty compensation depends on clinical productivity expectations; and little or no compensation is dedicated to educational responsibilities. Many physicians who participate in GME view the teaching of residents/fellows as a volunteer activity if their compensation corresponds only with clinical—and not educational—time and effort.</p> <p>Over the next decade, rapid changes in technology and health care delivery were expected to heavily influence the clinical and educational resources and needs across the medical education continuum. Many physicians reportedly find themselves responsible for teaching concepts and skills that they themselves did not acquire in their previous education. It was also stated that physicians increasingly function in clinical learning and working environments that require adaptation to rapid change. According to participants in the listening sessions, compensation models often do not keep pace with the increasing volume and novelty of educational responsibilities for which physicians who participate in GME are explicitly or implicitly responsible.</p> <p>These conditions were thought to have the potential to contribute to perceptions of heightened concern for burnout, work-life balance, and other well-being issues among physicians who participate in GME.</p> <p>As health care and education are affected by health care consolidation in the coming years (see Finding #16), health care organizations were expected to make a growing number of business decisions concerning GME, including compensation decisions for physicians who teach residents/fellows. It was thought that academic medical centers, medical schools, and specialty centers will likely continue to provide compensation for many physicians who participate in GME, including many with subspecialty or research expertise. It was uncertain to listening session participants whether health care and education organizations will continue to receive funding at present levels from federal, state, and local governments to support the teaching costs associated with physician training. A number of health care and education organizations were expected to determine that it is in their interest to cease participating in GME. A growing number of faculty whose compensation corresponds only with clinical effort were expected to be severely challenged to successfully manage a full clinical workload while volunteering additional time and effort to teaching.</p> <p>Because many educational activities will be designed to improve the productivity and efficiency of systems, health care organizations will likely increase their attempts to quantify the value of their resources dedicated to education and training. It was anticipated that their allocation of educational resources will increasingly constitute an investment in training a local, regional, or national workforce consistent with organizational goals. More health care and education organizations were expected to engage in operational and strategic planning that includes workforce development of health care professionals through education (see Finding #21). In general, it was thought that a SI's GME activities—including those of its leaders, educators, and residents/fellows—will increasingly need to demonstrate a return on corporate investment in the education of physicians. There were serious concerns that corporate- and consumer-driven health care and education models will disadvantage certain populations' health care quality and access due to socioeconomic, geographic, and other factors. Thus, it was not clear to listening session participants to what degree corporate workforce planning efforts—which will exert increasing influence over provider mix and distribution in the United States—are designed to meet the health care needs of the public.</p> <p>The health care consolidation process and its associated transactions were expected to renew demands for transparency and accountability for the financial investment in physicians' educational efforts to ensure the well-being of physicians, as well as safe and equitable care for patients. Highly successful SIs will likely have an important role in ensuring transparent mechanisms for determining the compensation of physicians who have teaching responsibilities related to GME. To conduct this oversight, SIs will need to continuously measure their value to the patient care missions of the clinical learning environment. Highly successful SIs will likely seek to ensure that physician compensation defines, measures, and incorporates educational value and productivity.</p> <p>It was thought that the public will be increasingly interested in ensuring transparency and accountability in health care financing, including organizational funding devoted to physician teaching efforts. It was also thought that experiential educational activities and educationally oriented clinical service will need to be incorporated into compensation models for physicians with GME responsibilities.</p>		

33. Resident/Fellow Learning Styles	Current View	2025 Projected View
	Learners entering GME have been educated in learning environments that are primarily electronic, highly engaged in self-directed learning, and highly adapted to individualized and just-in-time learning.	Learners entering GME have been educated in learning environments that are primarily electronic, highly engaged in self-directed learning, highly adapted to individual learning and just-in-time learning.
	<p>Presently, most health care professionals entering practice are Millennials. The generation will comprise more than half of the workforce in the United States in 2025. It was reported that Millennials possess technological awareness, adaptivity, and skills that are unprecedented in previous generations. Their proficiency in these areas were expected to increasingly facilitate rapid technological changes in health care and education (see Finding #4).</p> <p>As evidenced in the listening activities, Millennials currently entering health care professions demonstrate an affinity for electronic, self-directed, individualized, and just-in-time learning. Over the next decade, Millennials will also draw from a wide range of educational experience in self-directed Internet-based educational support, including medical literature as well as new and social media resources. By 2025, it was predicted that institutions of higher education—including medical schools—will have developed curricula and educational tools that fully embrace the generational learning styles and preferences of Millennials. It was reported that now and in the coming years, learners entering GME will be educated in learning environments that utilize electronic and asynchronous educational resources, that emphasize self-directed learning, that adapt in varying degrees to individual learning styles, and that facilitate just-in-time or experiential learning.</p> <p>Listening session participants reported that structured education in GME commonly occurs in group learning, didactic sessions, and online modules, with some adaptation to Millennials' learning preferences. Physicians who participate in GME vary in their experience with electronic, self-directed, individualized, and just-in-time learning; and with new and social media information. It was anticipated that in 2025, successful SIs will need to ensure that program directors and faculty members are aware of curricular approaches to GME that are consistent with the styles and preferences of learners from multiple generations. SIs will also seek to ensure that program directors and faculty members are able to guide learners in the appropriate professional use of a wide range of educational resources and materials—including social and other new media—to improve medical knowledge and patient care.</p>	
34. GME Educational System	Current View	2025 Projected View
	The GME educational system—which mostly consists of group learning and didactics, with some simulation activities—is not aligned with most learners' expectations for optimal learning experience.	The GME educational system is aligned with learners' expectations for optimal learning experience.
	<p>Participants in the listening activities described the current system for educating residents/fellows in medical knowledge and patient care to include formal components such as group learning and didactics, with some simulation and online educational activities. Educational design of GME was reported to be variably matched to the styles and preferences of learners entering GME, who demonstrate an affinity for electronic, interactive, self-directed, individualized, and just-in-time learning. It was also reported that learners currently entering GME demonstrate a proficiency in accessing a wide range of educational materials, including medical literature as well as new and social media resources.</p> <p>The GME educational system was expected to change in the coming years to accommodate current and future learners' expectations for learning experiences. It was projected that there will continue to be a role for didactic education, which will be widely valued for learners' direct access to experts. Some didactic education will be offered at a distance and/or asynchronously. The design of group learning, simulation, and online education were anticipated to be increasingly aligned with learners' educational needs and preferences, as well as increasingly individualized.</p> <p>As a result of corporatization, consolidation, commoditization, and other trends, many health care and education organizations will be engaged in designing educational experiences that target the productivity and efficiency of workforces providing patient care within their health care systems. Some of these educational experiences are likely to be experiential and interactive by virtue of their embeddedness in existing health care delivery structures. It was thought that a growing number of educational experiences will be adapted to particular organizational structures of interprofessional teams, health care delivery systems, or payment models. Faculty, residents, and fellows were expected to need increasing instruction in analyzing and applying new clinical resources derived from data and technology (see Findings #8 and #18).</p> <p>In 2025, SIs may play an important role in ensuring that educational experiences are designed to meet learner expectations, to prepare physicians for practice realities, and to stimulate the continuation of lifelong professional education. To be valued in 2025, SIs will need to ensure that program directors and faculty participate in the development of educational activities that include experiential and interactive components. It was expected that successful SIs will also seek to ensure that program directors, faculty, residents, and fellows develop shared professional expectations related to the appropriate use of patient information, new media, social media, and other information sources.</p> <p>Accrediting and governmental authorities will need to ensure that the various forms of health care education—including experiential and interactive learning activities—uphold the ethics and standards of health care professions. Thus, regulatory systems will need to distinguish how health care education contributes to safe and equitable patient care.</p>	

	Current View	2025 Projected View
	The duration of residency and fellowship is determined by time requirements for completion.	The duration of residency and fellowship remains primarily determined by time requirements for completion. However, there is substantial experimentation in competency- and outcomes-based training that is not based on time requirements for completion.
35. Duration of Residency/Fellowship Training	<p>The medical education continuum has long observed conventional durations for the components of physician education. In general, medical school currently takes 4 years; residency takes 3 to 7 years, depending on specialty; and fellowship training lengths are mostly standardized. Recently, there have been attempts to reexamine these durations and their appropriateness to the formative skills acquisition process for physicians in training. Competency-based medical education relies on assessment of skills development to determine individualized educational plans, which include focuses, levels, and lengths of training.</p> <p>In the coming years, it was expected that there will likely be continued experimentation with competency- and outcomes-based medical education, including experiments that focus on the rate of the learner's skills acquisition. It was thought that there will be a corresponding growth of literature that studies the performance of physicians who were educated in experimental training models.</p> <p>Most residency and fellowship programs in 2025 likely will continue to be fixed in their duration by time requirements established by regulators. However, it was anticipated that there will be increasing pressure from the health care organizations to streamline training. Undergraduate medical education will likely engage in curricular experimentation, including experiments related to duration and rate of advancement in medical school. Specialty and licensing boards and other regulators will consider certain aspects of competency- and outcomes-based educational models to be required components of health care professionals' lifelong learning.</p> <p>Due to financial forces associated with consolidation and corporatization, education and health care organizations were expected to show increasing interest in competency-based health care education that has demonstrated an ability to safely accelerate the training of health care professionals. Students, residents/fellows, and physicians were predicted to show a preference for individualized training models that focus on skills and outcomes—with the added potential benefit of accelerated training. It was projected that many employers and health care professionals will prioritize earlier career differentiation and specialization.</p> <p>To succeed in 2025, it was thought that SIs will need to provide a framework for educational planning and assessment that is supportive of educational experimentation and to ensure the educational and health care quality of competency- and outcomes-based experimentation in GME models. Similarly, SIs will need to ensure the availability of educational and clinical resources for all learners, regardless of their rate of skills acquisition; and should provide education and support related to remediation of faculty members, fellows, and residents. It was thought that DIOs, Graduate Medical Education Committees (GMECs), and other GME leaders will need leadership and management skills to oversee experimental educational plans.</p>	

	Current View	2025 Projected View
	GME is structured in discrete block rotations.	GME is structured around continuity of care, longitudinal patient care experience, and population health management.
36. Structure of Educational Experiences	<p>The curricula of most residency and fellowship programs are structured in discrete block intervals of weeks or months. It was stated that when making schedules for residents and fellows, schedulers must ensure the appropriate distribution of clinical and supervisory resources while ensuring that all residents and fellows obtain all of the units of educational experience—measured in a number of ways, including time duration and clinical procedural volume—that they will need to satisfy requirements for completion of their programs.</p> <p>Participants in the listening sessions foresaw that over time, there will be increasing challenges to the traditional block rotation model. Several reasons for this were identified. Residents/fellows will need to develop communication skills that enable them to ensure continuity of a given patient's care as it becomes fragmented among a larger number of providers (see Finding #11). It was thought that physicians' performance will increasingly be measured in the context of interprofessional teams' ability to manage high-quality care of individual patients and organizations' performance in caring for the patient populations they serve, making it difficult to measure the short-term clinical impact of a block rotator. Physicians who work in health systems were expected to increasingly need to assimilate patient information from multiple sources, to identify systems errors, and to participate effectively in systems improvement processes (see Finding #14). As health care organizations and health systems develop their health care information technology capabilities, it was anticipated that physicians will need to acquire skills that will facilitate their use of data for the purpose of quality improvement. It was thought that longitudinal experience in quality improvement may be necessary to allow residents/fellows to plan, conduct, and assess improvement efforts in a continuous manner. As there is increasing interest in educational experiments that accelerate the training of health care professionals, there was expected to be increasing pressure to eliminate block rotations that are not perceived to contribute to the future practice plans of physicians.</p> <p>It was projected that in the coming years, some SIs will need to work with their programs to restructure residency and fellowships to align with changes to health care delivery and to meet the changing educational needs of physicians. While there will be specialty-specific applications of these modifications, such modifications were predicted to have broad impact on patient care workflow and team-based care in clinical learning environments. Residents'/fellows' educational assignments were expected to occur over longer periods of time to ensure the development of appropriate skills in patient care, systems-based practice, practice-based learning and improvement, and interpersonal and communication skills. Where permitted, it was thought that residency/fellowship programs will need to reduce or eliminate rotations that do not serve organizational patient care and/or GME needs. Outcomes-based measurement and evaluation of resident/fellow performance will be enhanced by longer-term clinical assignments. Where possible, it was expected that residents/fellows will take advantage of flexible scheduling to focus earlier or more intensively on educational activities related to their plans for employment.</p> <p>In this future, SIs will need to oversee experimentation with the structure of residency/fellowship training to ensure educational quality as well as the safety of care provided by residents. It was thought that SIs must ensure that educational innovations—such as those that include lengthy assignments of high-intensity patient care—are designed to promote the well-being of residents/fellows. SIs should provide education and monitoring related to residents'/fellows' experiential and/or longitudinal educational activities.</p>	

	Current View	2025 Projected View
	<p>Models for compensating GME faculty for their educational effort are highly variable between and within SIs. Models range from explicit, effort-based compensation for education to vague effort expectations without compensation.</p>	<p>Forces external to GME—primarily manifested in demands for accountability to the public—will require more transparency on how physicians’ efforts are supported. Similarly, large health systems and health care organizations will require greater transparency in how physicians’ clinical and other efforts are defined.</p>
37. Compensation Models for GME Faculty	<p>It was reported that compensation for physicians who serve as GME faculty presently draws on financial resources from medical schools, hospitals, health systems, and/or other clinical practices and activities. Compensation models vary by organization and among physician specialties and subspecialties. In many cases, health care and education organizations fund faculty through a mixture of health system support, federal, state and local governmental sources, and philanthropic commitments to support the costs associated with maintaining faculty for GME.</p> <p>Based on Finding #31, it appears that the educational time and effort of many physicians who serve as GME faculty are based on compensation models that insufficiently value their educational activities. It was reported that clinical compensation models for physicians frequently incorporate RVUs corresponding with reimbursement formulas for governmental payments for physician services.</p> <p>It was reported that compensation models that use RVUs to set clinical productivity expectations generally do not take the same approach to setting educational expectations. It was also reported that in some cases, most or all faculty compensation depends on clinical productivity expectations, and little or no compensation is dedicated to educational responsibilities. Many physicians who participate in GME viewed the teaching of residents/fellows as a volunteer activity if their compensation corresponds only with clinical—and not educational—time and effort.</p> <p>Based on Findings #1, #4, #10, #25, and #26, over the next decade, rapid changes in technology and health care delivery will likely continue to affect the clinical and educational resources and needs across the medical education continuum. It was expected that many physicians will continue to find themselves responsible for teaching concepts and skills that they themselves did not acquire in their previous education. They are also expected to function in clinical learning and working environments that require adaptation to rapid change. In most cases, compensation models will likely struggle to keep pace with the increasing volume and novelty of educational responsibilities for which physicians who participate in GME are explicitly or implicitly responsible.</p> <p>These conditions were thought to have the potential to contribute to perceptions of heightened concern for burnout, work-life balance, and other well-being issues among physicians who participate in GME.</p> <p>Also described was a future where health care and education are affected by health care consolidation (see Finding #16). Health care organizations will make a growing number of business decisions concerning GME, including compensation decisions for physicians who teach residents/fellows. Academic medical centers, medical schools, and specialty centers will likely continue to provide compensation for many physicians who participate in GME, including many with subspecialty or research expertise. It was uncertain whether health care and education organizations will continue to receive funding at present levels from federal, state, and local governments to support the teaching costs associated with physician training. A growing number of faculty whose compensation corresponds only with clinical effort were expected to be severely challenged to successfully manage a full clinical workload while volunteering additional time and effort to teaching.</p> <p>Because many educational activities were expected to be designed to improve the productivity and efficiency of systems, it was thought that health care organizations will likely increase their attempts to quantify the value of their resources dedicated to education and training. Their allocation of educational resources were anticipated to increasingly constitute an investment in training a local, regional, or national workforce consistent with organizational goals. In 2025, more health care and education organizations will engage in operational and strategic planning that includes workforce development of health care professionals through education (see Finding #21). In general, it was thought that a SI’s GME activities—including those of its leaders, educators, and residents/fellows—will increasingly need to demonstrate a return on their organization’s investment in the education of physicians. In this future, there were concerns that corporate- and consumer-driven health care and education models will disadvantage certain populations’ health care quality and access due to socioeconomic, geographic, and other factors.</p>	

38. Transparency of GME Financial Support	Current View	2025 Projected View
	Financial support for GME faculty effort is not transparent in most SIs.	Most SIs are transparent in how they support their GME faculty.
	<p>In many health care organizations, it was reported that financial support for the educational effort of GME faculty is not transparent to GME administration, funders of GME, and/or faculty themselves. In instances when faculty compensation depends on mostly or entirely on clinical productivity expectations, it was reported that little or no compensation is dedicated to educational responsibilities.</p> <p>The health care consolidation process and its associated transactions were expected to renew demands for transparency and accountability for the financial investment in physicians' educational efforts to ensure the well-being of physicians, as well as safe and equitable care for patients. Highly successful SIs were thought to have an important role in ensuring transparent mechanisms for determining the compensation of physicians who have teaching responsibilities related to GME. To conduct this oversight, it was thought that SIs will need to continuously measure their value to the patient care missions of the clinical learning environment. It was predicted that highly successful SIs will seek to ensure that physician compensation defines, measures, and incorporates educational value and productivity.</p> <p>Over the next decade, it was thought to be appropriate for regulatory bodies to set higher expectations for accountability and transparency in organizational funding devoted to physicians' education of residents and fellows (see Finding #31).</p>	
39. Recognition of Other Health Care Professionals as Faculty	Current View	2025 Projected View
	GME is supported by a physician faculty with a faculty of other health care professionals who are not formally recognized by the ACGME.	Other health care professionals who teach residents are recognized for their role by the ACGME.
	<p>While physicians are the primary educators of residents and fellows in the present-day system, it was reported that other health care professionals often serve in faculty teaching roles that are most often only informally recognized by residency and fellowship programs. (This report defines "other health care professionals" as nurses, nurse practitioners, physician assistants, pharmacists, technicians, social workers, and others who directly provide some aspect of clinical care.) Other health care professionals were reported to serve in a variety of educational roles in GME, with some teaching residents and fellows as well as learners in other health care professions.</p> <p>At present, the ACGME does not formally recognize most other health care professionals as core faculty members in the programs it accredits. The ACGME accreditation process does not recognize interactions between residents and fellows and other types of learners, except in cases when those interactions are perceived to diminish the quality of education within accredited programs.</p> <p>The scope and specialization of practice among other health care professionals was expected to continue to change in the coming years, enabling the delivery of some aspects of care with greater independence. It was thought that patient care over time will be delivered in a greater variety of settings and more asynchronously, requiring more—and more complex—coordination among interprofessional team members.</p> <p>Effective patient-centered care coordination in interprofessional teams requires overlapping leadership and communication skill sets in physicians and other team members. In clinical learning environments, it was anticipated that there will be additional opportunities for interprofessional learning, as there will be more purposeful alignment of tasks and skills with particular health care professions and professionals. It was projected that successful SIs of GME will seek to ensure the development of interpersonal and communications skills, practice-based learning and improvement, systems-based practice, and professionalism that physicians will need to function in interprofessional practice environments. According to participants in the listening activities, these competencies will include specific skills that can be applied to emerging health care delivery models that emphasize team functioning, telemedicine, the use of clinical data and technology to improve care, and patient-centered care.</p> <p>It was thought that in 2025, faculty who are not physicians will serve in increasingly prominent roles in the education of various health care professionals, including physicians, and that residents and fellows will increasingly share educational experiences with other kinds of learners. It was thought that SIs will structure a growing number and range of experiences (such as simulation) to facilitate interprofessional learning.</p> <p>In this future, ACGME requirements related to the supervision of residents and fellows may likely need to be very inclusive to the roles of faculty members who are not physicians. It was thought that surveys and other accreditation tools should evaluate both positive and negative impacts of interprofessional education within clinical learning environments.</p>	

40. Simulation and Other Educational Resources	Current View	2025 Projected View
	SIs and health systems are highly variable in their development of and commitment to expensive learning tools such as simulation labs.	Expensive educational resources such as simulation labs are shared resources among SIs and smaller health systems.
	<p>At present, SIs and health systems were reported to be highly variable in their development and coordination of education and clinical skills assessment through simulated clinical experiences for residents and fellows. Most of residents'/fellows' exposure to simulation was said to target specialty-specific and physician-specific skills and competencies. Some of the resident and fellow simulation activities are interdisciplinary and/or interprofessional; these experiences were reported to focus primarily on building team community skills, and less on high-cost, high-fidelity team function in procedural areas. Simulation resources under the direct or shared authority of the GME community were reported to be rare. For many SIs with medical schools, simulation resources are reportedly shared between medical students and residents. It was indicated that there are many approaches to simulation that utilize a wide range of teaching and assessment methods, and simulation activities vary in their degree of fidelity, technological sophistication, and cost. At present, the ACGME does not have Institutional or Common Program Requirements related to simulation activities in GME.</p> <p>Over the next decade, it was projected that there will be a greater need for multiple kinds of simulated training and assessment tools, as the profession of medicine increasingly requires educational experiences that promote the productivity and efficiency of team-based and systems-oriented health care. Health care organizations will increasingly value simulation that offers safe and controlled experiential exposure to techniques, technologies, systems, and teamwork that will prepare learners (both new learners and existing staff) to function effectively in their health care delivery structures.</p> <p>It was predicted that simulation resources will continue to be expensive. There were expected to be significant costs associated with the technological and human resources and space needed for many types of simulation activities. Other types, such as exercises involving role-play, were thought to be inexpensive. Over the next decade there was projected to be increasing understanding of how to balance costly, high-fidelity simulation with less expensive, high-fidelity simulations. To address the needs for simulation experience, SIs and residency programs will likely increase the types of access and shared simulation experiences by licensing them from vendors and/or by affiliating with other organizations who control simulation facilities.</p> <p>If the cost of expensive learning tools such as simulation decreases over the coming years, it was thought that more SIs will capitalize on their ability to invest in the local development of simulated learning experiences. If the cost of "home-grown" simulation resources remains high, it was thought that smaller SIs likely will continue to form partnerships to provide appropriate, cost-effective simulation experiences for their learners. Health care organizations and medical schools were also expected to maximize the value of simulation resources that are designed for training multiple disciplines and health care professions, and that are adaptable to undergraduate, graduate, and continuing medical education needs.</p>	
41. Scholarly Activity	Current View	2025 Projected View
	Scholarly activity is primarily recognized as peer-reviewed publications.	A wide variety of scholarly activities are viewed as equivalent in value to peer-reviewed publications.
	<p>It was reported that scholarly activity currently consists of a range of peer-reviewed academic pursuits that may include, but are not limited to, funded research, journal and textbook publications, conference presentations, quality improvement projects, and participation on regional, state, or national committees. In many specialties of medicine, peer-reviewed publications were thought to occupy a singular status among the forms of scholarly activity as "the coin of the realm," or the most commonly intelligible marker of programs' educational quality as manifested in scholarly productivity. Academic appointment and promotion decisions for GME faculty were said to privilege peer-reviewed publications over other forms of scholarly activity.</p> <p>The ACGME sets requirements for residents', fellows', and faculty members' scholarly activity in accredited GME programs. Accreditation standards for scholarly activity are delineated largely in specialty Program Requirements established by ACGME Review Committees. In the current accreditation system, SIs are required to provide systems for education and monitoring related to residents', fellows', and faculty members' scholarly pursuits. Many SIs that provide centralized support for scholarly activities were reported to direct their resources toward resident, faculty, and fellow involvement in basic, translational, and clinical research efforts.</p> <p>In the future, it was predicted that opportunities for new forms of scholarly activity will expand. While it was thought that some SIs are likely to continue to promote the development of physician-scientists who will advance clinical discovery, others will find it in their organizational interests to foster research opportunities in less traditional areas, such as health systems science or educational research. Correspondingly, it was anticipated that the measurement of scholarly activity outcomes will adjust to recognize the value of multiple kinds of peer-reviewed scholarship. Appointment and promotion decisions were expected to begin to incorporate this broader view, as organizations establish criteria for recruiting and retaining the physicians who demonstrate proficiency in improving health systems. Specialty Review Committees will continue to define disciplinary expectations related to scholarly activity.</p> <p>Over the next decade, it was thought that the ACGME should anticipate the medical profession's continued evolution in the breadth and scope of its academic products. It was also thought that SIs will gain new insights from their efforts to support different types of scholarly activity across the medical disciplines.</p>	

		Current View	2025 Projected View
42. Faculty and Distance Learning		GME program faculty are primarily local.	GME program faculty include a mix of local faculty as well as regional, national, and international faculty who participate remotely.
		<p>In the present system, faculty members with responsibilities for educating residents or fellows were generally reported to be the same physicians who have responsibilities for direct or indirect clinical supervision of the residents or fellows (ie, they are usually physically present or otherwise available at the sites of patient care). Local GME program faculty were reported to have primary responsibility for the didactic education of residents and fellows.</p> <p>It was thought that changes to health care delivery models over the coming years will likely disrupt the conventional designation of faculty members in some health care organizations. As many hospitals, health systems, and health care organizations extend their geographic reach through physical expansion and with remote and home-based care models, the supervisory and educational roles of some physicians were expected to evolve to include oversight of patient care and leadership in interprofessional contexts. Interprofessional teams will increasingly rely on electronic media for virtual and remote communication. As consolidation and other market forces impact the distribution of health care providers, it was thought that some health care organizations will need to address scarcities of specialists by drawing upon mobile, shared, or virtual clinical and educational resources. Underserved geographic areas and patient populations were expected to increasingly rely on remote access to local, statewide, or regional clinical resources to ensure appropriate patient care. While many GME faculty will remain embedded in the same clinical learning environments as the residents and fellows they educate, the structural and technological changes above were expected to prompt health care systems to explore the potential of remote supervision and education to the extent permitted by law and policy.</p> <p>Changes to technology and dissemination were said to have provided ever-increasing regional, national, and international access to virtual instruction and expertise through open source and proprietary online educational programs, simulation resources, via web-based interactive video platforms and social media. While local participating sites will continue to serve as loci of GME faculty activity, SIs and programs will increasingly utilize technology to provide remote access to faculty expertise, when such access is feasible and cost-efficient. Residents, fellows, medical students, faculty, and other learners will adapt to the increasing use of electronic platforms in education throughout the health care professions.</p>	
VII. Uncertainty in GME Funding			
43. Funding Sources of GME		Current View	2025 Projected View
		The federal government is the largest contributor of funding for GME.	Health systems and health care organizations increasingly engage in the development of their own physician workforces, including contributions to fund GME. The federal government contributes some level of funding for GME.
	<p>Currently, federal, state, and local governments contribute large amounts of financial support for GME. The largest of these sources continues to be the Centers for Medicare and Medicaid Services (CMS), which supports residency and fellowship training in teaching hospitals. CMS expenditure in GME has been contained for the past 20 years due to implementation of the Balanced Budget Act of 1997, which capped reimbursement for allowable GME costs in correlation with resident full-time equivalent positions in teaching hospitals' 1996 cost reports. In addition, the Department of Veterans Affairs has consistently provided significant support through GME Enhancement and other programs.</p> <p>It was reported that health care organizations have maximized the benefit of CMS reimbursements to teaching hospitals and other governmental funding mechanisms for GME. Over the past 20 years, organizations have increased their own financial investment in residency and fellowship training, mostly through a commitment to training clinical fellows in accredited and unaccredited programs. Health systems are beginning to serve as the primary investors in new GME programs designed to prepare a physician workforce aligned with organizational strategic goals.</p> <p>While there is a high degree of uncertainty regarding the future of governmental funding for GME, many individuals involved in GME thought it likely that the federal government will continue to provide some type of continued financial support, although there was no prevailing prediction regarding the type and scope of support. If GME were divested of federal funding in any large measure, it was reported to be likely that residency and fellowship programs in some teaching hospitals would no longer be financially viable. However, there was no consistent view of how changes to GME funding might affect GME or the health care system. Large health care organizations and health systems that remain committed to GME would likely increase their strategic investment in GME programs to produce physicians whom they will later employ. It was not clear what mix of specialty and subspecialty programs will be supported by this corporate investment. There was significant concern that the allocation of GME funding in the future will be determined by corporate interests, and not necessarily by the needs of patients and patient populations.</p>		

	Current View	2025 Projected View
44. Accountability and GME Funding	Federal and state funding for GME requires little accountability.	Federal and state funding for GME will require additional transparency and accountability.
	<p>At the present time , governmental funding for GME is usually tied to basic cost reporting of full-time equivalent residency and fellowship positions. The renewal or distribution of most types of GME funding is not based on assessments of clinical or educational performance. It was reported that teaching hospitals and other recipients of GME funding are not typically obligated to disclose how funding is allocated to support educational programs.</p> <p>There was a high degree of uncertainty regarding the future of governmental funding for GME (see Finding #41). Many individuals involved in GME thought it likely that the federal government will continue to provide GME funding in some form over the next decade; however, there was no consistent prediction of the type and scope of future support. If GME funding were subject to restructuring, superseding funding models were predicted to parallel alternative clinical payment models by linking reimbursement to the quality and efficiency of GME as determined by educational and clinical outcomes. Considering the current environment of value-based payment that has evolved in relation to need for accountability of public funding, GME funding may also have a pay-for-performance component.</p> <p>To prepare for the risks associated with the uncertainty of GME funding, it was thought that SIs will increasingly seek to define the value of their GME programs and allocate funding consistent with organizational priorities. Where external funding for GME is partial or nonexistent, it was thought that most organizations will need to advance an explicit business case to justify the presence of GME programs.</p>	
	VIII. The Role of GME in the Continuum of Medical Education	
45. Alignment of Undergraduate, Graduate, and Continuing Medical Education	Current View	2025 Projected View
	UME/GME/CME rely on different educational methods.	UME/GME/CME educational methods are increasingly aligned.
	<p>Undergraduate, graduate, and continuing medical education (UME/GME/CME) are distinct phases in the development of physicians, each of which is associated with a particular set of educational experiences and expectations. Medical students develop a scientific foundation through UME curricula that include classroom and laboratory activities before engaging in a series of supervised fundamental clinical experiences in a range of specialties. Residents and fellows receive their GME primarily by way of supervised clinical experiences; and in regular, longitudinal lectures, other clinical conferences, and supervised research activities. Practicing physicians engage primarily in self-directed learning using a CME framework; in educational activities provided by their employers; in activities related to regional, state, national, or international specialty societies; and in education and assessment as required for licensing or specialty board certification. Learners in all phases were reported to interact frequently with one another in clinical learning environments, sometimes engaging in common educational activities. There were reported pedagogical similarities and differences among the 3 phases of physician education. It was reported that in SIs that have UME, GME, and CME responsibility for each phase is not usually assigned to the same individuals. The educational programs of each phase are subject to review by different accrediting bodies.</p> <p>In the coming years, it was anticipated that a growing number of education and health care organizations will continue to experiment with competency- and outcomes-based training—including a number of experiments that focus on the rate of learners’ skills acquisition—often with the aim of safely accelerating trainees’ completion of training requirements. It was expected that many employers and health care professionals will prioritize earlier career differentiation and specialization (see Finding #34). Health care organizations were expected to cultivate their own workforces by contributing to or developing curricula for all levels that prepare physicians who are competent in practice-based learning and improvement and systems-based practice. Taken together, these trends create a demand for the different phases of physician education to align structurally in a way that is different from the current model.</p> <p>It was thought that SIs will likely respond to these phenomena by coordinating more closely with medical schools, health systems, and/or large health care organizations in their educational planning, including experimentation in competency- and outcomes-based educational models. A growing number of individuals will have responsibilities across the medical education continuum, and there will be more pedagogical similarities among the different educational phases. Some SIs will have a role in ensuring the availability of educational and clinical resources for learners, regardless of their rate of skills acquisition; and that educational techniques will increasingly incorporate distance learning through Internet-based activities. In this future, DIOs, GMECs, and other GME leaders will need to possess the leadership and management skills needed to oversee enhanced interdisciplinary and interprofessional educational plans, sometimes in coordination with UME or CME programs. It was predicted that the educational programs of each phase will remain subject to review by different accrediting bodies.</p>	

46. Medical Student Attributes	Current View	2025 Projected View
	Medical schools primarily matriculate students with strong scientific skills.	Medical schools matriculate students with high levels of achievement in increasingly diverse academic disciplines and interests.
	<p>It was thought that when making admissions decisions, medical schools currently give significant consideration to applicants' scientific foundation as demonstrated in prerequisite coursework and standardized test results. Admissions processes were said to consider a range of other applicant attributes, provided that applicants have demonstrated appropriate development of scientific knowledge, skills, and abilities. As described in Findings #4 and #5 above, the medical education continuum will need to prepare an increasingly diverse group of learners to meet the needs of the US population. Efforts to educate a physician workforce that includes residents from diverse racial and ethnic backgrounds were viewed by participants in the listening activities as beneficial to advancing culturally competent health care, to addressing social determinants of health, and to reducing disparities in health care among racial or ethnic groups.</p> <p>In 2025, medical school admissions committees will continue to maintain expectations for premedical scientific education and testing, and will continue to attempt to recruit students with a range of qualities, backgrounds, and interests. In response to changes to the medical profession brought about by consolidation and other market forces (see Findings #16 and #21), health care organizations will compete for physicians whose diverse academic backgrounds can be applied to emerging health systems' needs. For example, physicians with proficiency in mathematics or computer science would apply their skills to the development or implementation of information technology; physicians with educational backgrounds in the social sciences would be able to bring valuable perspectives to organizational approaches to population health management. To the extent that medical schools will respond to the workforce demands of health care organizations, they likely will recruit medical students who have demonstrated a range of knowledge and skills that they will later draw upon as employees of health systems.</p> <p>As a result, GME programs will increasingly seek to recruit residents from a pool of residents with diverse academic and personal backgrounds that may have direct relevance to the multicultural nature of emerging health care organizations, as well as to skills in health systems science. It was anticipated that SIs with a high degree of integration between GME and the clinical learning environment will identify individualized educational opportunities that allow further development of interdisciplinary knowledge, skills, and abilities.</p>	
47. SI Models	Current View	2025 Projected View
	SIs that are not medical schools are the predominant model.	SIs that are not medical schools are the predominant model.
	<p>In the 2015–2016 Academic Year, there were 792 ACGME-accredited SIs. Approximately 15% of all ACGME-accredited SIs identified themselves as “academic medical centers/medical schools” (ACGME Data Book, 2015–2016, p. 114). The ACGME has entered into an agreement with the American Osteopathic Association (AOA) and the American Association of Colleges of Osteopathic Medicine (AACOM) to fully implement a Single Accreditation System for GME by the year 2020. As of February 2017, 69 new SIs have achieved ACGME accreditation through this transition, including a number of osteopathic medical schools.</p> <p>SIs can be medical schools, health systems, large health care corporations, academic medical centers, community hospitals, specialty hospitals, consortia, educational foundations, ambulatory care sites, medical examiner's offices, and other types of entities. All types of SIs are subject to ACGME Institutional Requirements. In 2025, allopathic and osteopathic medical schools will remain involved in GME, mostly by serving as SIs or by providing educational resources through affiliation with health care organizations. Educational consortia such as osteopathic postdoctoral training institutions (OPTIs) were expected to continue to provide value and shared learning among networks of participating sites for GME. There was expected to be significant growth in the number of health systems and large health care organizations that serve as SIs, as these organizations make strategic investments in developing their health care workforce. It was thought that some hospitals that currently serve as SIs will transfer their sponsorship to health systems through mergers, acquisitions, and other transactions. There will continue to be a wide variety of types of ACGME-accredited SIs.</p>	

48. Transitions From Medical School to Residency	Current View	2025 Projected View
	Medical students are often unprepared for the transition to residency training.	Medical school experience is designed to create a smooth transition to residency training.
	<p>The fourth year of medical school and the first year of residency training were said to be challenging transitional periods in a physician's development. In their fourth year, medical students must devote substantial time and effort to residency applications and interviews as they complete medical school curricula; first-year residents make rapid transitions to new clinical learning environments where they suddenly have many more responsibilities.</p> <p>Participants in the listening sessions reported that learners often find themselves unprepared for the transition. It was indicated that many medical schools are reforming their curricula to enhance students' preparation for residency responsibilities and, in some cases, to encourage earlier clinical specialization. It was reported to be increasingly common for residency programs and SIs to augment administrative orientation activities with clinical boot camps for first-year residents. Boot camps are brief, intensive learning experiences—often involving simulation—that build clinical skills and prepare residents to function safely in their new roles.</p> <p>It was envisioned that in the coming years, medical schools and residency programs will implement curricula that provide greater flexibility in the transition between UME and GME. There will be increased efforts to enhance medical students' clinical readiness, well-being, and resilience as they begin residency. The success of these future efforts were thought to depend to a large extent on how well medical schools, SIs, and programs create a fluid educational transition.</p>	

Aspects of Practice of Medicine and Concerns for the Future		
1. Health Care Professionals as Healers	Current View	Concern for the Future
	Physicians' central role as healers is an essential component of patient care.	Concern about physicians' central role as healers, as this role is increasingly shared with other members of the health care team.
<p>It was reported that physicians place great value on their roles as healers, in part because of the sense of joy associated with these roles. Major changes to health care delivery were viewed by many as a threat to the professional joy that physicians derive from this longstanding status.</p> <p>As physicians increasingly share responsibility for patient care with other members of interprofessional teams, it was anticipated that there will be less 1-on-1 communication with patients. Patients will continue to view physicians as healers, but that they will also see other health care professionals in these roles. It was reported that cumbersome and depersonalizing aspects of the EHR will continue to impose perceived barriers to the healing relationship. The technological and structural changes that affect the health care system will, in turn, begin to reshape this relationship.</p>		
2. Face-to-Face Clinical Encounters	Current View	Concern for the Future
	Patients' face-to-face encounters with physicians are viewed as an essential component of patient care.	Concern about the quality and quantity of physicians' face-to-face encounters with patients in lieu of remote contact and patient care provided by other health care professionals.
<p>Routine face-to-face encounters between patients and physicians—most commonly occurring in office visits—were viewed as an essential component of patient care. These encounters were expected to become less frequent with greater use of wearable and portable devices in patient care; with more routine care provided by other health care professionals; with more patient care provided remotely through electronic media; and with more care provided in the home, at retail outlets, or in community-based settings (see Findings #1, #6, #11, #14, and #15).</p> <p>The profession of medicine was expected to redefine itself as changes to the health care system result in fewer face-to-face physician/patient encounters. It was anticipated that physicians will need interpersonal and communication skills that will ensure clinical quality in rapidly changing health care models, and that they will also need to attain new skills in systems-based practice.</p> <p>Based on experiences with implementation of EHRs, many physicians were skeptical that technological changes will ever enhance the humanistic aspect of their practice. It was thought that high-functioning clinical learning environments would support faculty members and residents/fellows in the effective use of technology to provide patient-centered care.</p>		

3. Bedside Interactions	Current View	Concern for the Future
	Bedside interactions and education are viewed as an essential component of inpatient care and GME.	Concern about the quantity and quality of bedside interactions due to reduced need for physical examination and the increasing number of other health care professionals.
<p>Bedside interactions and education were viewed as a cornerstone of experiential learning in residency and fellowship programs. While patient rounds have long provided opportunities for residents/fellows to develop their medical knowledge and patient care skills, they have, in more recent years, begun to include interprofessional communication and systems-based care planning as new areas of emphasis.</p> <p>In 2025, technological innovations were expected to reduce the need for care provided by physicians at the bedside, and an increasing range of health care professionals were expected to share responsibility for inpatient care. There was concern that changes to the nature of inpatient care will have a negative impact on residency and fellowship education at the bedside.</p>		
4. Physician Workforce	Current View	Concern for the Future
	Primary care physicians represent a substantial workforce that meets basic health care needs in the United States.	Concern about the size and scope of practice of the physician workforce for primary care needs.
<p>Primary care physicians were considered to represent a substantial workforce that meets basic health care needs in the United States. Many residency and fellowship programs in family medicine, internal medicine, pediatrics, and obstetrics and gynecology are designed to prepare physicians to serve communities as primary care physicians.</p> <p>In the coming years, it was expected that nurse practitioners, physician assistants, and other health care professionals will meet an increasing share of patients' basic care needs. For some routine issues, it was thought that patients will increasingly purchase cost-efficient care from retail providers. Many underserved communities will continue to face chronic shortages of primary care physicians and other health care professionals. While there was projected to be a need to continue to educate primary care physicians, health care organizations and health systems were expected to play a major role in defining the future primary care landscape. There was concern that market forces are threats to the quality and accessibility of primary care provided by physicians.</p>		
5. Readiness for Unsupervised Practice	Current View	Concern for the Future
	There is inconsistency in residents' readiness for unsupervised practice upon completion of residency programs.	Concern that inconsistency in residents' readiness for unsupervised practice will not be remedied.
<p>During residency and fellowship training, residents and fellows assume progressive authority, responsibility, and conditional independence in patient care as assigned by program directors and faculty members. At the end of a resident's or fellow's training, the ACGME requires program directors to provide a summative evaluation verifying that the resident has demonstrated sufficient competence to enter unsupervised practice in their specialty or subspecialty.</p> <p>Through accreditation, state medical licensure, and specialty board certification processes, the regulatory environment for medical practice clearly defines the criteria that determine physicians' ability to enter practice. Many health care executives, DIOs, program directors, faculty members, residents, and fellows thought that some graduates of GME training—core residency training, in particular—are not fully prepared to enter unsupervised practice.</p> <p>It was reported that in some specialties, residents must enter fellowship programs to achieve certain clinical career goals. While fellowship training was mostly pursued by aspiring physician-scientists in the past; completion of a fellowship was considered to be <i>de rigueur</i> for physicians in many subspecialties who pursue primarily clinical careers.</p> <p>In the listening sessions it was apparent that there was a concern that this lack of preparedness would need to be addressed. Because the profession of medicine has reportedly encouraged a high degree of physician specialization, some core residency programs were said to be designed with the assumption that residents will receive additional training before they enter practice. Just as some learners were said to struggle in the transition from medical school to residency, some residents and fellows reportedly struggle in the transition from residency or fellowship into the physician workforce. In the future, as SIs and GME programs experiment with different designs in GME training models, these models will need to address the medical profession's concerns about residency and fellowship graduates' readiness for unsupervised practice.</p>		

6. Delineation of Different Types of Health Care Professionals	Current View	Concern for the Future
	<p>Patients are usually able to identify different types of providers.</p>	<p>Concern that changes to health care delivery will make different types of providers less recognizable to patients.</p>
<p>In the current system, patients are exposed to different types of health care providers who are responsible for their care. In this complex health system environment, it was reported that patients are usually—however not always—able to identify different types of providers and their roles.</p> <p>Health care in the United States was expected to become even more complex in the coming years. In the health care market, it was anticipated that a growing number of businesses will offer an expanded range of services. Interprofessional teams will incorporate additional members—including technology with artificial intelligence—in care processes. It was predicted that there will be a greater number of care settings as home-based care, and care delivered via an electronic medium, become increasingly popular.</p> <p>There was concern that these changes will make it more difficult for patients and families to identify the different types of health care providers and specific individuals who are responsible for their patient care. Health care professionals will increasingly need to possess interpersonal and communication skills that will be needed to educate patients about their roles within the complex interprofessional teams that will define their health care in the future.</p> <p>In this future, SIs will likely play an important role in training physicians who can partner with patients who are attempting to navigate health care complexity. It was felt that SIs and their GME programs will need to support educational activities that acculturate residents and fellows to meet the imperative of ensuring that patients and their family members have access to information that is easily understandable and relevant to their personal and social realities.</p>		

Summary of Findings

The findings in the previous section represent the collective viewpoints of participants in the *SI2025* listening activities, who described potential developments in health care and the education of physicians in the coming decade. The listening activities provided a wealth of information about emerging conditions and trends from which to develop a vision for Sponsoring Institutions (SIs) that is rooted in the context of projected future health care and educational environments.

At its October 2016 and February 2017 meetings, the Task Force explored the findings and a projected evolutionary path for graduate medical education (GME). The diverse perspectives of the listening session participants as well as the Task Force (in both the sessions and its deliberations) imparted a broadly informed understanding of future physicians' professional responsibilities to patients, to their colleagues, and to fellow members of their interprofessional health care teams.

To further conceptualize the expected changes to health care and GME, the Task Force returned to the broad categories of the findings related to health care and GME in 2025:

- I. Changing Health Care Needs
- II. Changes in Health Care Delivery
- III. Evolution in Health Care Systems
- IV. Evolution in the Role of the Physician
- V. Evolution in the Role of Other Health Care Professionals
- VI. Evolution in Graduate Medical Education
- VII. Uncertainties in the Models for GME Funding
- VIII. The Role of GME in the Continuum of Medical Education

Democratization, Commoditization, and Corporatization of Health Care: 3 Major Forces Shaping Health Care and the 21st-Century Physician

Utilizing the 8 broad categories of findings as a basis for further discussion, the Task Force identified 3 major driving forces that appear to be shaping changes to the health care system over time:

1. rapid *democratization*;
2. increasing *commoditization*; and
3. advancing *corporatization*.

While these 3 concepts are viewed by the Task Force as major driving forces, they are not viewed as the only causes of change—nor are they mutually exclusive. However, each figured dominantly in the forecasts of the groups interviewed. The Task Force concluded that the model for GME in 2025 will need to account for the impact of these forces of change.

Democratization

“[The act of making] (something) available to all people; [the act of making] it possible for all people to understand (something).”³

³ Merriam-Webster. “Democratize.” <https://www.merriam-webster.com/dictionary/democratize>. Accessed October 24, 2017.

The democratization of medical knowledge and patient care emerged as a major theme in the Task Force's interpretation of its findings. This phenomenon concerns the real and potential technologically enabled diffusion of information and health care services throughout health care professions, communities, and populations. This is not to imply that there will necessarily be sweeping improvements to health care access and accessibility. As noted in the Task Force's findings, health care disparities are predicted to persist in many communities due to social, economic, and geographic factors. It remains to be seen whether the force of democratization, as defined here, will be harnessed to improve health care significantly for underserved patient populations.

In the listening sessions, there was general agreement that responsibilities for diagnosis and treatment of human disease are shared among different types of health care professionals in 2016. The roles of other health care professionals, patients, families, and artificial intelligence–assisted technology in relation to medical knowledge and patient care will continue to evolve over the coming decade.

Many patients and their families will have the ability to access electronically ever more sophisticated and personalized health information. Concomitant with expanded information access will be proprietary tools (eg, smartphone applications or “apps”) that convert complex medical knowledge into user-friendly information for the purposes of (1) guiding health care decisions; (2) assisting in formulating treatment plans; (3) facilitating health care planning; and (4) enabling self-care. Participants in the listening sessions agreed that many patients and their families will have greater control over flows of detailed health information in a manner that may enhance their participation in their health care, whether in collaboration with health care professionals and teams, or independently.

In 2025, there will be continuing differential accessibility of health information by individuals and populations, as well as continuing differential proficiency in utilizing such information. Patients' proficiency in using health information will become increasingly important, as it will increasingly determine the timing and method of patients' access to care, as well as their ability to communicate electronically and/or asynchronously with their providers. Nevertheless, most patients and families will be in greater proximity—and, in general, will have greater potential access—to a large volume of detailed information related to their own health care. The expansion of access and the creation of user-friendly technological tools is expected to improve the overall health literacy of the US population over the next decade. With respect to health care in 2016, participants in listening sessions commonly reported instances in which patients enter clinical encounters armed with considerable knowledge relevant to their care, which in some cases rivals the rote knowledge of their health care providers. As a consequence of proliferating open information sources, increasing popularity of portable/wearable devices, and increasing portability of health records, it will be increasingly routine for patients and family members to engage in independent inquiries of protected or public health information in preparation for clinical encounters with their providers.

Health information that patients and their families bring to clinical encounters can frequently add value and efficiency to the provision of health care; it also can complicate communication and the delivery of appropriate care when information is incorrect, misleading, or misinterpreted. Physicians and other health care professionals will increasingly be compelled to integrate the medical knowledge of patients and their families into the health care they provide. Physicians' ability to ensure the effective use of this information—including the ability to recognize and communicate its virtues, flaws, and limitations—will become an increasingly recognized skill.

Democratization is also predicted to have a continuing impact on other health care professions and on health care delivery systems. The scope of practice associated with many health care professions is expected to widen. As a result, more health care professionals will be expected to acquire advanced medical knowledge and skills, and to assume greater responsibility and independence in their provision of health care services. Some services, which in 2016 were only available in dedicated inpatient and ambulatory health care facilities, will be readily available through retail outlets—many of which may not be part of the traditional health care sector—in 2025. Technology enhanced with artificial intelligence will offer important contributions that enhance the reach and productivity of health care teams, and will challenge traditional definitions of health care professions.

Considered together, these trends speak to substantial changes to the health care system. For patients, the major potential upside of these changes is the expansion and accessibility of health care services made possible by advanced technology, a larger workforce, and effective teamwork. So that patients and families

are optimally positioned to benefit from these advantages, health care professionals will need to be able to address the complexity that may be introduced by the multiplicity of settings, providers, and technological tools involved in the care of a given patient. Physicians will frequently be required to coordinate and utilize an unprecedented volume of health information from a variety of sources. Some health care professionals who participated in the listening activities stated that they are presently challenged to keep pace with the high volume and intensity of the medical knowledge to which they are exposed, and that they expect this difficulty to increase in the coming years.

Based on its conversations, the Task Force found that medical education—and graduate medical education in particular—was not well equipped in 2016 to accommodate the progressive democratization of medical knowledge, and the enhanced interpersonal and communication skills it will require of physicians and other health care professionals. Many listening session participants expressed that health care professionals will need to acquire the knowledge and skills needed to effectively assimilate the changing (and increasingly highly informed) perspectives of patients and their families into the work done by health care teams.

Commoditization

“ . . . [A] process in which goods or services become relatively indistinguishable from competing offerings over time. Generally speaking, commoditized products within specific categories are so similar to one another that the only distinguishing feature is pricing.”⁴

The Task Force agreed that the findings pointed toward a general trend of commoditization in health care, wherein health-related goods or services become so commonplace that patients and their families (as health care consumers) make choices by price, and not by the perceived quality of a provider’s health care services (ie, the “brand”). This driving force is enabled by standardization and automation in health care.

Participants in the listening sessions reported that the rapid standardization of health care services will play a determinative role in how patients use the health system of 2025. By dictating the form and substance of many health care transactions, standardization will facilitate the expansion of certain health care services into new retail settings; it will formalize the respective roles of health care team members in new ways; and it will utilize technology to automate and/or guide portions of care processes. As a result, there will be fewer perceived differences in the quality of health care delivered by different providers or in different locations.

In 2016, commoditization can be observed in the delivery of certain common health care services, such as those related to cataract removal. Some health care consumers increasingly seek routine health care services (eg, immunizations) in pharmacies, “big-box” stores, other retailers, or at home. It is anticipated that over the next decade, the number and types of organizations offering these types of services will increase, and a larger and more complex range of services will be provided in nontraditional settings such as ambulatory care facilities, retail chain stores, community centers, and patients’ homes.

While many examples of commoditization concern primary care services, the listening sessions also indicated commoditization of services that involve subspecialty care and/or hospitalization. Over the coming decade, for example, payment models will likely feature increasing bundling of services related to a particular health care intervention (eg, joint replacement), which will potentially encourage the provision of health care services in nontraditional and/or lower-cost settings.

Several listening session participants projected that with the expansion of some health care services into new settings, it is likely that the increasing standardization of care will provide new opportunities for health care professionals to provide some services without the direct or indirect supervision of a physician. It was projected that there will continue to be a need for ongoing oversight of care provided by health care team members, and that physicians and other health care team leaders will need to apply critical thinking skills to prevent, identify, and resolve errors in health care environments in which care is increasingly standardized and/or automated.

In the listening sessions, participants offered various perspectives on the future of health care finance, but many of their perspectives shared a common assumption: that health care consumers will assume a greater share of health care costs due to higher health insurance premiums, deductibles, copayments, and/or coverage

⁴ Investopedia LLC. “Commoditize.” <http://www.investopedia.com/terms/c/commoditize.asp>. Accessed October 24, 2017.

restrictions. In the emerging health care system, consumers who are facing increasing health care expenses will weigh cost heavily when making health care decisions, thereby reinforcing patients' tendencies to make health care decisions based primarily on cost. Thus, market conditions and consumer decisions are likely to have a role in advancing the commoditization of health care.

In summary, the Task Force heard in its listening activities that commoditization will shape health care delivery in 2025 in a manner that expands health care into new settings; emphasizes the need for highly coordinated, team-based health care; uses technology to support clinical decision-making; and requires health care professionals to optimize systems to ensure patient safety while containing health care costs. The future GME system will need to prepare physicians whose sense of professionalism has evolved in relation to these dramatic changes.

Corporatization

“To subject to corporate ownership or control.”⁵

Since as early as the 1980s,⁶ it has been observed that health care in the United States increasingly embraces a corporate model. In previous decades, the corporatization of health care concerned the privatization of hospitals and the influence of national and multinational corporate interests in the health care marketplace. From 2016 to 2025, the corporatization of health care will be manifest in the ongoing consolidation of health care services and facilities under the management of large and complex health care systems.

During the listening sessions, the Task Force heard a strong signal that the practice of medicine—and, therefore, physician education—needs to adapt to keep pace with accelerating corporatization. It was apparent in the Task Force's conversations (and supported by data external to *SI2025*) that the practice of medicine is rapidly moving away from individual and group physician practices affiliated with hospitals, and toward large corporate systems of ownership that span inpatient and outpatient care settings. Listening session participants thought that corporatization is already altering the practice of medicine substantially; and also that the medical education system has not adequately responded to the changes.

In 2016, graduating residents, fellows, and other learners in the health care professions are transitioning from their educational programs into salaried positions in large health systems. Through mergers, acquisitions, and the creation of new facilities, many health systems are expanding their geographic coverage to serve regions of the country, to improve the stability of revenue streams, to manage cost increases, and to spread fixed costs over a larger base. It is expected that in 2025, almost all newly graduated residents and fellows will enter practice under the employment of large corporate systems. The Task Force expressed concern that without changes to the model for GME, it cannot be ensured that they will acquire skills needed to manage patient care optimally in these environments.

There is a perception that the anticipated rise of large health systems will require complex distribution and coordination of patient care responsibilities among members of health care teams, including physicians. Many physicians will be expected to be proficient in supervising and/or coordinating care within large systems. Most physicians will be expected to use clinical data for the purpose of quality improvement. While their specific roles will vary, physicians will generally be expected to perform effectively in teams and to contribute to achieving organizational goals related to operational performance and patient care.

It was observed in the listening sessions that populations in rural and urban areas of the United States are unlikely to be served fully by corporate health systems, particularly when business interests are not aligned with the economic realities of providing health care in a manner that meets these populations' health care needs. Physicians in 2025 should be prepared to address ongoing disparities in health care, including those that are created or reinforced by corporatized health care.

Teamwork, team management, organizational development, project management, data management, and leadership development—some of which are already enshrined in the ACGME competencies of practice-based learning and improvement and systems-based practice—are among the skills complex organizations will

⁵ Merriam-Webster “Corporatize.” <https://www.merriam-webster.com/dictionary/corporatize>. Accessed October 24, 2017.

⁶ McKinlay JB, Stoeckle JD. Corporatization and the social transformation of doctoring. *Int J Health Serv.* 1988;18(2):191–205.

expect from physicians in their employ. The Task Force found that residents and fellows will require substantial educational experience in these and other areas to prepare them to succeed in their future practice environments.

By changing professional expectations, corporatization may challenge traditional definitions of professionalism in medicine. Rapidly growing health care corporations that engage in GME are likely to attempt to retain graduates of their residency and fellowship programs as practicing physicians, and therefore are likely to make efforts to instill professional values that are associated with a highly skilled and productive workforce. Some listening session participants expressed apprehension over the corporatization of GME and its potential for conflict with traditional views of physician autonomy and leadership in the future. There was significant concern that corporate priorities will threaten some important concerns of the medical profession such as engaging in public service and meeting community needs. To many, it was not apparent that physicians will be able to advocate for their patients effectively within large corporate structures.

Concern for Preserving Professional Attributes and Other Aspects of the Profession of Medicine

In its listening activities, the Task Force heard a number of concerns from participants about how the profession of medicine will be defined in 2025. Many of these concerns related to humanistic and altruistic aspects of physicians' sense of professionalism; others related to the definition of the profession in relation to patients, other health care professions and professionals, and the health system. All of the concerns intersect in some way with physicians' sense of professionalism, and/or in the joy derived from the fulfillment of physicians' professional roles. The concerns are summarized in the findings as follows:

- I. Health Care Professionals as Healers
- II. Face-to-Face Clinical Encounters
- III. Bedside Interactions
- IV. Physician Workforce
- V. Readiness for Unsupervised Practice
- VI. Delineation of Different Types of Health Care Professionals

Many listening session participants expressed their desire to retain positive aspects of health care and education that are perceived to be under threat by changing expectations imposed on GME by the evolving health care environment. A number of participants identified tension or conflict between attributes of the medical profession and some emerging health care trends.

Reflecting on these concerns, the Task Force concluded that in order for the profession of medicine to retain qualities and values regarded to be essential, it will be necessary to promote the following physician attributes:

- **healers** who are able to make effective use of technology and information systems to enhance their healing relationship with patients;
- **servant-leaders** who collaborate with others and prioritize the needs of others in decision-making;
- **advocates** who promote patient-centered care, who meet the needs of the populations they serve, who recognize and address social determinants of health, and who recognize and address disparities in health care; and
- **team members** who work and communicate with health care professionals toward effective coordination of patient care.

Based on the Task Force's conversations, these attributes may be central concepts of professionalism for physicians functioning in the health care system of 2025. The meta-forces of democratization, commoditization, and corporatization have the potential to facilitate or impede the development of these physician attributes. Many listening session participants felt that the profession of medicine should advance these qualities through the educational and clinical systems overseen by SIs.

Conclusions

While the 3 driving forces of democratization, commoditization, and corporatization do not operate exclusively in the health care sector, the Task Force isolated their predicted likely impact on particular aspects of health care and the education of health care professionals in 2025.⁷ The Task Force also considered the attributes of professionalism that will characterize physicians in this future state. It was apparent from the findings that these and other forces would strongly influence the roles of future SIs.

In the GME system of 2025, some aspects of academic medicine—such as scientific discovery and technical innovation—are expected to follow a historical model with relatively little disruption; other aspects of physicians' professional formation—such as those described above—will need to transform.

With the aim of summarizing the information gathered and synthesizing it into a framework for the future conditions of GME, the Task Force drew the following conclusions from the *SI2025* findings:

1. The evolution of health care will increase in complexity and pace during the next decade due to driving forces such as democratization, commoditization, and corporatization, as demonstrated in the findings of the *SI2025* listening sessions.
2. This evolution illustrates a need to better align the resources of GME (ie, residents/fellows, program directors, faculty, GME leadership, and educational infrastructure) with efforts to improve health care.
3. The GME community should play constructive roles in the profession of medicine's adaptation to the rapidly evolving US health care environment.
4. The talent and creativity exhibited by the residents, fellows, and medical students who participated in the listening sessions are inspiring. Clinical learning environments should incorporate and recognize learners' skills and abilities in efforts to address clinical and educational challenges.
5. The insights and findings of the *SI2025* project point to an emerging essential role for the institutional sponsor of GME (ie, ACGME-accredited SIs) to coordinate, facilitate, and lead GME changes that are consistent with the evolution of health care and the health of the US population over the next decade.

⁷The Task Force identified the 3 forces as the primary drivers of change in graduate medical education from 2016 to 2025. Numerous other phenomena will have substantial impacts on the future of graduate medical education, as noted in the "Findings."

Recommendations

The Task Force makes the following recommendations based on (1) its experience of listening to a large number of stakeholders across the United States, and (2) its deliberations concerning the listening session findings and their implications for graduate medical education (GME)—and more specifically, for the role of the Accreditation Council for Graduate Medical Education (ACGME) in accrediting Sponsoring Institutions (SIs) in the United States. This section fulfills the ACGME Board of Directors' charge to the Task Force to make recommendations concerning the future direction of ACGME institutional accreditation.

The recommendations reflect the conclusions of the “Summary of Findings” section of this report, as well as the following considerations:

- ACGME has been accrediting SIs of GME since 1992 and will likely continue this function.
- ACGME-accredited SIs serve an important role in ensuring the quality of GME.
- ACGME's future must be defined by the value it provides for patients, physicians, and clinical learning environments.

ACGME-Accredited Sponsoring Institutions of Today

Currently, the primary responsibilities of ACGME-accredited SIs are (1) to provide an oversight and administrative structure for ACGME-accredited residency/fellowship programs; (2) to ensure appropriate educational and clinical resources; (3) to manage the appointment of residents/fellows; (4) to maintain the quality of residents'/fellows' educational experiences and environment; and (5) to address the well-being of residents/fellows and faculty members. Key activities of present-day SIs include managing a variety of issues related to residents'/fellows' appointment to their programs; supporting the functions of the Designated Institutional Official (DIO), Graduate Medical Education Committee (GMEC), and, in most cases, a GME office; creating and maintaining appropriate communication mechanisms for GME stakeholders; and oversight efforts related to the ACGME Institutional and the Common and Specialty-Specific Program Requirements. The SI is accountable for communications with external organizations on its own behalf and that of its ACGME-accredited programs. Many SIs also assist in the administration of unaccredited residencies/fellowships, and of ACGME-accredited programs that are based in other SIs, but which assign residents/fellows for external educational experiences (ie, rotations).

In many of today's SIs, institutionally led educational activities include orientation events for new residents/fellows and ongoing educational activities as required by law or policy. In most SIs, day-to-day resident/fellow education is primarily designed and overseen by the leadership of the residents'/fellows' respective programs. SIs oversee education in their programs to ensure their compliance with ACGME Common and Specialty-Specific Program Requirements. SIs vary in the extent to which their GME leaders communicate with executive leadership of sites that participate in their GME programs.

ACGME-Accredited Sponsoring Institutions of 2025

The Task Force concludes that SIs in the year 2025 will need to have evolved into more complex entities. Sponsoring Institutions will have retained many—if not all—of the administrative and educational responsibilities detailed above. They will also have become responsible for at least 2 additional functions:

1. SIs will have begun to offer enhanced inter- and multidisciplinary educational programming and experiences for residents, fellows, and faculty that support the development of physicians in their professional roles.

SIs in 2025 will need to have developed enhanced educational experiences and programming to promote the development of skills and behaviors common to physicians across specialties. Based on input from the listening sessions, topics for such education should include, at a minimum: the use of electronic health records in decision support and management; engagement in health systems performance (eg,

patient safety, quality improvement, and high-value care); professionalism and leadership skills; and interdisciplinary and interprofessional team-based performance skills and behaviors.

2. Graduate medical education leadership of SIs will have assumed increasing accountability for the value of GME. Graduate medical education leaders will have become successful in coordinating SIs' GME efforts with tactical or strategic organizational goals, in coordination with executive leaders of participating sites for GME.

The Task Force defines the value of GME as the contribution made to the improvement of health care as the result of educating residents/fellows. Not all of this value correlates with a monetary equivalent. While some types of value are undoubtedly financial, SIs' residency/fellowship programs may add value by contributing to an organizational mission in a way that does not directly produce savings or revenue.

To enhance the value of GME, SIs will need GME leaders who can engage the talents and enhance the skills of residents, fellows, and faculty in improving health care. These leaders will need to be able to demonstrate the added value of GME to the executive leadership and governance of its clinical partners. Leaders of SIs will increasingly need to collaborate with GME stakeholders (eg, quality and safety officers, departmental and program leadership, residents and fellows) to design enhanced educational experiences that provide value to the clinical enterprise. GME leaders will be responsible for ensuring the contribution of GME to health care at participating sites.

The Task Force recommends that the ACGME should guide the necessary evolution of ACGME-accredited SIs that will be able to fulfill additional functions in 2025 as described above. In doing so, the ACGME should focus on 3 approaches:

1. **Accreditation:** The ACGME can introduce revisions to its Institutional Requirements to bring about desired changes to SIs. While changes to accreditation requirements can be very effective in producing limited and/or focused changes, the needs of the future SI are not entirely known. Using accreditation as the primary mechanism for driving change could limit SIs in developing innovative, creative methods for fulfilling their emerging responsibilities, and could create resistance from SIs facing other challenges in the broader regulatory environment.
2. **Enhanced Recognition:** The ACGME can offer enhanced recognition to SIs for their efforts to enhance education or add value to GME. Enhanced recognition could be conferred for reaching objective targets associated with progress toward meeting the responsibilities of a future-oriented SI. This approach could accelerate change without imposing additional requirements.
3. **Education:** ACGME educational programming can provide valuable assistance to SIs as they evolve into their future state. Changes made through education alone would depend on the motivation of SIs and the quality of the educational programming. This approach offers the most flexibility, and also draws upon the expertise and leadership of the GME community.

The Task Force recognizes that the projected evolution of the SI will unfold over several years, and will require a series of steps to achieve widespread and sustainable change (FIGURE 1).

Evolution of the Roles and Responsibilities of the Sponsoring Institution, 2016-2025

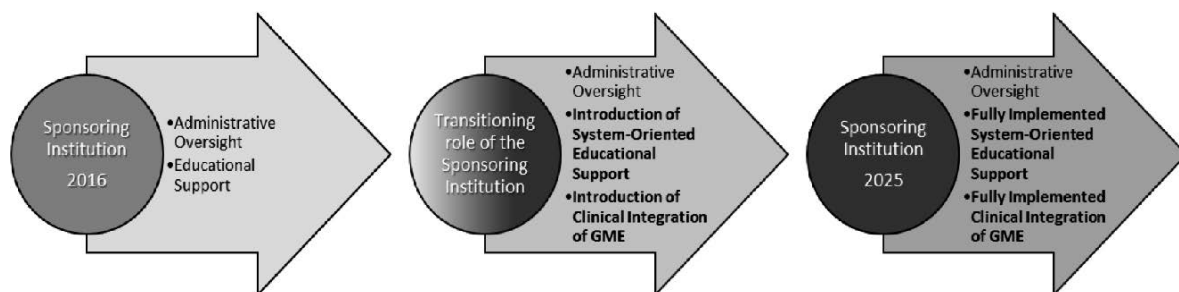


FIGURE 1

Based on the results of the *SI2025* project, the Task Force affirms that the ACGME should support SIs in training physicians who will be prepared to meet the needs of patients and their families in 2025. Therefore, the Task Force makes the following recommendations:

Recommendation I

The ACGME should follow a 3-step, 8-year process to revise the Institutional Requirements. The ACGME should introduce and develop standards for SIs that are consistent with the future state envisioned in the findings of *SI2025*.

It is recommended that the 2017–2018 revisions to the Institutional Requirements incorporate the evolution of the clinical learning environment that is represented in the revised Common Program Requirements.

In 2020, the Institutional Requirements should be revised to include expectations for robust systems-based educational support and for some strategic integration of GME and clinical learning environments.

In 2024, the Institutional Requirements should be revised to include expectations for high-performing, fully implemented educational programs around systems-based practice, and for complete strategic integration of GME within its clinical learning environments.

Recommendation II

The ACGME should develop and implement a new initiative designed to recognize SIs that are complying with Institutional Requirements while also leading in the areas of enhanced, systems-based educational support and integration of GME within clinical learning environments.

The knowledge gained from this initiative should be used in revising the Institutional Requirements, as outlined in Recommendation I. It should also be used to drive GME performance improvement by highlighting local, community-based innovation as a driver of excellence in patient care. This initiative will need to demonstrate value to SIs as well as their participating sites. If possible, this initiative should be developed in collaboration with organizations that advance health care quality.

Recommendation III

The ACGME should promote the development and implementation of educational programs that develop the skills of GME and health care leaders, faculty, residents, and fellows. These programs should emphasize activities that prepare participants to contribute effectively to the future health care system.

These educational programs should support: (1) the preparation of physicians to practice in complex health care systems; (2) an understanding of the ways by which executive leadership and their governance effect change in these complex health systems; and (3) innovation in GME that is interdisciplinary and interprofessional. If possible, this initiative should be developed in collaboration with organizations that advance health care quality.

Recommendation IV

The ACGME should develop a mechanism to continually evaluate the health care environment to ensure close alignment of ACGME expectations for SIs with the rapidly changing health care system and societal health care needs.

Continual surveillance would provide ACGME with the information needed for ongoing improvement in institutional accreditation. This recommendation provides opportunities for the ACGME to engage GME stakeholders on an ongoing basis, and to partner with other organizations to improve health care and education.

Summary

These recommendations describe a model for institutional accreditation that seeks to:

- ensure appropriate minimum requirements for SIs in the year 2025;
- support SIs in creating robust, future-oriented educational programming and experiences;

- create a pathway for the development of SIs that will allow them to oversee and support the education of 21st-century physicians; and
- provide flexibility to adjust the model in response to unpredicted changes.

This approach will prepare SIs to train a physician workforce that will succeed in their subsequent unsupervised practice, and to take a leading role in improving health care and population health in the United States.