CONFERENCE SUMMARY

May 2011 | Atlanta, Georgia

Ensuring an Effective Physician Workforce for the United States: Recommendations for Reforming Graduate Medical Education to Meet the Needs of the Public

The Second of Two Conferences—The Content and Format of GME

Graduate medical education (GME), the training of physicians between medical school and independent practice, has been criticized in the United States for not adequately preparing physicians for their future practices and for not being sufficiently responsive to the needs of society. Although notable changes have occurred in GME over the past decade, including the introduction of a competency-based framework and limitations on duty hours, many people feel that much broader reforms are needed to keep pace with changing patient demographics, the evolution of health care delivery, the need to use health care technologies more effectively, and the demand for a more efficient, cost-effective health care system.

A Compelling Need for GME Reform

Many prior calls for GME reform have failed to produce meaningful change. Now, however, a convergence of forces makes a more compelling case for accelerating reform. The first force is the changing demographics and disease burden of our patient population. The population over 65 years of age is expected to double by 2030, and octogenarians are the fastest growing subgroup. People are living longer, with more chronic diseases and an increasing incidence of concomitant medical, cognitive, and functional issues. The epidemics of obesity and diabetes have added to the chronic disease burden. Also, our population is more ethnically, racially, and culturally diverse and will become even more so in the decades ahead. Changes in demographics and disease patterns and increasing health disparities create new health care needs, requiring new approaches to physician education that emphasize collaboration, communication, and transitions in care.

The second force is the transformation of our health care system, which was well underway prior to the passage of the Patient Protection and Affordable Care Act. Care delivery and technology continue to move out of the hospital into other facilities, the community, and the home. Care is commonly provided by teams of health professionals, who are assuming new roles. The Affordable Care Act will accelerate these changes and, by extending health insurance to 32 million more Americans, will put stress on the system and create a demand for new delivery and payment models while addressing the desirable goal of improving access to care. Our trainees must be prepared to work in different organizations and sites of care and in teams of health professionals. They will need the skills to work in and lead an evolving health care system.

The third force relates to the explosive growth in health care technology and our need to use these technologies with optimal efficiency and safety for patients. Advances in medical diagnostics, therapeutics, and information technology can significantly improve health outcomes. However, we have fallen short in consistently using

technology optimally to improve the quality and efficiency of health care. We need to train the next generation of physicians to optimally use medical and information technology, to follow the principles of quality improvement and patient safety, and to practice medicine based on the best evidence.

The fourth force is the unsustainable growth in the cost of our current health care system. Total health care expenditures were $2.5 trillion in 2009, representing 17.6% of the gross domestic product. The next generation of physicians must help to create a more efficient health care system that is sustainable and affordable. Physicians in training must understand the financial implications of their patient management decisions, and their training must include new and efficient models of care so that they will be prepared to practice cost-effective medicine and be responsible stewards of resources while providing high-quality patient care.

In addition to these external forces, there are stimulants for reform from within GME. Educators are struggling to maintain the quality of GME amid growing tension between work-hour restrictions and the need for sufficient clinical experience to develop expertise. At the same time, educators are working to protect precious curricular time from the encroachment of non-educational tasks. Program directors and teaching faculty also find it increasingly difficult to provide trainees with sufficient independence to support their advancement, especially in procedural specialties.

Alongside these external and internal forces that challenge the traditional content and structure of physician training are concerns that the GME system is not training the right specialty mix or number of physicians to meet society's needs. A previous Macy conference report ("Who Will Provide Primary Care and How Will They Be Trained?") called for a greater investment in primary care. However, trends in physician training are moving in the opposite direction. In the past decade, the number of residents in subspecialty training has risen five times faster than the number of residents in the core specialties (those representing primary board certification). The number of residents expected to practice primary care has declined by more than 10%, and the number of residents in other core specialties in which a shortage is predicted, such as general surgery or psychiatry, is unchanged or has decreased.[1]

Predictions of physician workforce needs have a poor track record for accuracy. However, the current demographics of our general population and of the physician workforce make a shortage of physicians in the near future very likely. While estimates of the magnitude of the shortage vary widely, many predict it will be in excess of 100,000 physicians by the middle of the next decade. Changing care models, new roles for other health professionals, improved efficiency, and alterations in physicians' career decisions could mitigate this predicted shortage but are unlikely to eliminate it.

Of course, GME reform cannot solve all of the problems of the health care system. Physician specialty and location choices are determined by many factors that are outside of the control of GME, such as the admissions policies of medical schools, the magnitude of indebtedness of physicians upon graduation, and the monetary and non-monetary rewards of practice in each specialty. While the GME system does not control all of the variables affecting the size and composition of the physician workforce, it does have a profound influence on physicians' attitudes and skills through program design, sites of training, role modeling, and mentoring. Positive or negative experiences during residency have an important influence on physicians' ultimate career choices. In addition, GME is responsible for the efficiency with which it produces physicians who are ready for practice. In preparing physicians for independent practice, the GME system and its component programs must be dually accountable to the trainees entrusted to them and to the public.

The public expects the GME system to produce a physician workforce of sufficient size, specialty mix, and skill to meet society's needs. Many observers from both public and professional vantage points feel it is currently falling short in each of these dimensions.

Developing Recommendations for Reforming GME in the United States

Concerns about the status quo, the convergence of forces demanding change, and the importance of GME to our health care system led the Josiah Macy Jr. Foundation to undertake a major initiative on GME reform. GME is not a single entity, but rather is the sum total of the accreditation and certification organizations, regulatory bodies, sponsoring institutions, individual programs, faculty, and academic leaders that together prepare physicians to practice in the United States. The conclusions and recommendations that follow are addressed to these various participants in the GME system.

[1] Cronenwett L & Dzau V. In: Culliton B, Russell, S, editors. Who Will Provide Primary Care and How Will They Be Trained? Proceedings of a Conference Sponsored by the Josiah Macy Jr. Foundation; 2010; Durham, N.C. Josiah Macy, Jr. Foundation; 2010.

These conclusions and recommendations are the result of the second conference on GME reform sponsored by the Macy Foundation, convened to focus on the content, structure, and format of the GME system. Our conference built upon the recommendations of the conference held in October 2010 ("Ensuring an Effective Physician Workforce for America: Recommendations for an Accountable GME System"), jointly sponsored by the Macy Foundation and the Association of Academic Health Centers (AAHC). That conference, chaired by Michael M.E. Johns, MD, Chancellor of Emory University, addressed the funding and regulation of GME.[2]

Guided by the principle that GME is a public good that must be accountable to the needs of the public, those conferees made five major recommendations:

1. An independent external review of the goals, governance, and financing of the GME system should be undertaken by the Institute of Medicine, or a similar body.
2. Accreditation policies should enable GME redesign.
3. The funding of GME should be re-examined to assure there will be an adequate number of physicians.
4. Mechanisms should be established to fund innovations in GME.
5. An immediate increase of 3,000 entry-level positions in targeted core residencies should occur, with subsequent changes based on accurate workforce assessments.[2]

The second conference took place in May 2011, with Debra Weinstein, MD, Vice President for Graduate Medical Education at the Partners Healthcare System, as the chair. The invited participants came from all regions of the United States and from Canada, and reflected multiple specialty backgrounds. They represented a range of experiences in GME at the individual program, department, medical school, regional health system, and national levels. Conferees participated as individuals and not as representatives of any organizations.

The group was charged to build on the recommendations from the first conference. Participants were asked to take a societal perspective (rather than a purely institutional or professional perspective) in assessing the current state of GME programs and recommending changes. They were urged to think broadly about the optimal state of GME in general rather than for an individual specialty.

The conference featured topical discussions around the content and structure of GME. Each section included a plenary session to highlight the issues, breakout groups for in-depth discussion of specific questions, and reports of potential recommendations for consideration by the entire group. Further discussions identified areas of concordance among breakout group reports, examined disagreements, and explored new ideas. This process led to a series of consensus conclusions and recommendations on how GME should be reformed to better meet the needs of the public.

The public good was the foundational consideration in assessing the current state of GME and the lens through which all proposals for change were viewed. Selected background material and two commissioned papers helped participants begin with a common frame of reference, and the rich experience of participants informed the deliberations. The result was a strong call for change with concrete recommendations aimed at strengthening the alignment of GME with societal needs in order to better prepare an effective physician workforce for the future.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion I: GME must meet the needs of—and be accountable to—the public.

The programs, institutions, accreditors, educators, and regulators that together comprise the GME system hold collective responsibility and accountability for GME.

Recommendation I-A: To respond effectively to society's evolving health care needs, GME must create and maintain a dynamic, ongoing exchange with the public through appropriate partnerships that engage communities in feedback, analysis, and planning.

- Individual institutions sponsoring GME should engage one or more member(s) of the public to serve on the GME committee, such as a public member of the institution's board of directors. Expanding the perspectives "at the table" will provide new insights into both problems and solutions.

2 Michael M.E. Johns, Chair, Ensuring an Effective Physician Workforce for America, Proceedings of a Conference Sponsored by the Josiah Macy Jr. Foundation, held in Atlanta, GA, Oct. 24–25, 2010; New York: Josiah Macy Jr. Foundation; 2010.

- National GME organizations [such as the Accreditation Council for Graduate Medical Education (ACGME), American Board of Medical Specialties (ABMS), American Osteopathic Association (AOA), and Association of American Medical Colleges (AAMC)] should strengthen engagement with consumer organizations, patient interest groups, policy makers, and other representatives of the public. This could be accomplished through increased representation of members of the public on the boards of GME-related organizations, and through greater participation of organizations representing the public in GME meetings.

Recommendation I-B: Evaluation of GME at the institutional and national levels should be transparent.

- Training programs, sponsoring institutions, and accreditors should publicly report GME outcomes based on nationally agreed-upon metrics. National organizations involved in regulation or oversight of GME should also report relevant data.

Recommendation I-C: The GME system should be proactive in responding to and anticipating significant changes in health care delivery and practices.

- Principles of continuous quality improvement should be applied to GME at the institutional and national levels. GME should be both nimble and flexible in striving to enhance the quality and outcomes of education.

Rationale

GME is responsible for upholding a social contract with the public it serves. GME benefits from significant public funding and must demonstrate a clear return on society's investment. GME is responsible for self-monitoring and largely self-regulating its professional outcomes; to do this responsibly, GME must have ongoing dialogue with key stakeholders in order to understand society's needs and its expectations of individual physicians and the medical profession as a whole.

It is no longer sufficient to say that producing competent physicians meets GME's responsibility to the public, though graduating skilled practitioners and verifying their competence to undertake independent practice are fundamental requirements. The GME system must also be a responsible steward of public funds and ensure that the process of education is efficient, cost-effective, and evidence-based. Finally, GME must address society's health care needs in terms of the number and specialty distribution of physicians.

Currently, GME's structure and content are shaped by teaching hospitals and professional organizations, influenced by institutions' needs to provide care, and constrained by organizational silos and some degree of competition between medical specialties. The voice of the public in GME planning and assessment would help ensure that GME's goals are continually reaffirmed and that GME programs are designed to achieve these goals.

Conclusion II: High-quality GME requires experience with a diverse mix of patients, clinical problems, and health care delivery mechanisms to support a curriculum that addresses evolving patient, population, and health care system needs and expectations.

Recommendation II-A: The sites of training should expand to reflect current and future patient care needs.

Special attention should be paid to non-hospital training sites, though some programs may need to incorporate greater exposure to technology-intensive, high-acuity settings.

- Individual sites should be selected based on demonstrated patient care quality and educational merit, as measured by teaching effectiveness (including the quality, ability, and commitment of educators); a learning environment characterized by professionalism, effective communication, and adequate supervision; the necessary educational infrastructure; and, importantly, quality patient care. If available sites do not reflect these characteristics, then such sites must be developed.

- GME sites should include the breadth of settings where physicians in the given specialty provide patient care. In addition, because all clinicians, including those in hospital-based specialties, receive patients from and discharge them back to non-hospital care settings, all trainees must have experience in outpatient settings and care sites outside the medical center where their residency is based. The selection of sites and the amount of time allocated must be appropriate to the specialty.

- GME sites should incorporate established and emerging models of health care delivery (such as medical homes), provide meaningful experience in team-based care and population health, and incorporate new technologies such as electronic health records and telemedicine.

Rationale

The GME curriculum is delivered primarily through the residents' participation in supervised clinical activity. Residents can develop only a theoretical appreciation of patient problems and settings of care to which they are never exposed. Many reports indicate that physicians are not fully prepared for practice at the completion of residency training. Because less care is delivered in hospitals, which are the predominant site for GME, it is urgent to diversify training sites to provide the necessary breadth of clinical experience. In addition, many settings in which residency education currently occurs do not have the attributes required for effective learning. For example, some settings in which residents see outpatients are chaotic, offer poor continuity with patients, or do not afford developmentally appropriate supervision.

Requirements for Implementation

GME funding mechanisms must support GME programs when trainees are assigned to non-hospital training sites.

Faculty development (i.e., training physicians as educators) and evaluation of faculty are necessary to ensure that all training sites have committed faculty who are knowledgeable and skilled in state-of-the-art educational practices.

Additional Notes

- Appropriate training sites should be determined based on a common understanding and expectation about future health care delivery models and an analysis of their implications for education.
- Examples of new sites include community-based clinics or physician groups, community hospitals, long-term care facilities, chronic care sites, patient homes, hospices, work- and school-based clinics, and federally qualified health centers. Other new sites could be population specific, such as prisons, homeless shelters, or global health sites.
- Aggregate outcome measures of the institutional quality of care and the population health of its surrounding community should be developed and reported publicly so that GME can, over time, be concentrated in sites with excellent outcomes, and so that the relationship between teaching activities and patient/community outcomes can be studied.

Recommendation II-B: The content of training should expand to include topics essential for current and future practice, particularly those related to professionalism, population medicine, and working effectively in the health care system.

- Enriched educational content in these areas, along with engaging teaching and learning strategies, should be meaningfully integrated into GME programs in all specialties, and the impact on physician behaviors and quality outcomes should be rigorously assessed.
- The ACGME core competencies provide an effective framework for this expanded curriculum but must be better integrated with clinical performance. GME programs must assess resident performance with respect to these competencies in various care settings and stages of development using national standards. (Applicability of this recommendation to the competency domains of the AOA should also be evaluated.)

Rationale

As noted previously, physicians require new skills to care for an aging patient population with increasing complexity, amid a growing array of diagnostic and therapeutic options and an urgent need to contain cost. The ACGME core competencies have made progress in this direction, while also helping to move accreditation toward a more outcomes-oriented approach. However, the competencies remain poorly standardized and incompletely assessed and are too often taught and evaluated outside the context of patient care.

Residency programs have had difficulty operationalizing the core competencies, in part because many of the teaching faculty do not really understand or embrace some of the competencies and associated curriculum. Thus far, many GME programs have done little more than include new topics in the didactic portion of the program; delivering this content only through a lecture series is not effective.

Requirements for Implementation

Teaching methods and assessment tools will need to be developed, validated, and disseminated on a national level for consistent use in GME. Faculty development in these topic areas will be essential. Residency Review Committee site visits and related paperwork will need to more directly assess outcomes related to the core competencies.

Additional Notes

- Education in the area of professionalism should include diversity and cultural competence, teamwork, leadership, ethics, social responsibility, conflict management, methods for lifelong learning, personal accountability, and physician well-being.
- Population-focused content should include preventive medicine, community health, and socioeconomic determinants of health.
- Topics critical to effective functioning within the health care system include quality and safety, cost-effective care, health information technology, and remote medical care.
- Self-awareness and critical evaluation of one's own performance, collaborative participation in inter-specialty and inter-professional teams, dealing with complexity and ambiguity, societal responsibility, and cost awareness are increasingly important and must be emphasized within the current competencies or as new competencies.
- A refinement of the core competency framework should be influenced by other successful models. For example, the CanMEDS construct developed by the Royal College of Physicians and Surgeons of Canada gives a more holistic and integrated view of the roles physicians must master.

Recommendation II-C: Education should occur across historic professional boundaries to consistently incorporate inter-specialty and inter-professional education into GME. All residents should have opportunities to learn with and from physician colleagues in other specialties and from other health professionals.

Rationale

Patient care, particularly for older individuals and those with complex problems, increasingly requires effective collaboration across medical specialties and the various health professions. Joint educational activities can establish the foundations of effective, patient-centered, team-based care. Current medical education inculcates physicians with a "captain of the ship" attitude, which can impair inter-professional collaboration. To counteract this tendency, GME should incorporate a respect for the expertise of other health professionals and foster the development of sophisticated teamwork skills; residents should participate in substantial clinical and non-clinical educational activities with learners in the other health professions.

Inter-professional and inter-specialty education can also be an effective way to address curricular topics that are relevant to all health care providers, offering improved teaching efficiency and the richness of varied perspectives.

Requirements for Implementation

Regulations (of state licensing boards, ACGME, or other organizations) prohibiting supervision across specialties or professions will need to be revised where they present obstacles to inter-specialty or inter-professional education. Likewise, billing requirements may need to be revised to avoid penalizing a responsible caregiver who is supervising, confirming, or supplementing the care given by an appropriately credentialed caregiver from another specialty or discipline.

Additional Notes

- Collaborative education should be incorporated into patient-based education in both traditional (hospital and ambulatory clinics) and non-traditional (e.g., home hospice) settings, for example, through collaborative practice, multidisciplinary rounds, and case-based conferences. Additional non-clinical integrated educational activities could include quality improvement projects and simulation-based team training.
- Inter-professional education and inter-specialty physician education will likely be most effective when learners are brought together at appropriately matched levels of professional development so that their knowledge and experience allow for a similar level of discussion, learning, and participation in patient care.

- In some instances, potent inter-professional education may need to involve supervision across disciplines, as appropriate to the nature of the activities being supervised.

Conclusion III: There is both need and opportunity for greater efficiency in delivering GME. Accomplishing this will also help to address national physician workforce needs, while enhancing the quality of training.

Recommendation III-A: The length of GME should be determined by an individual's readiness for independent practice—demonstrated by fulfillment of nationally endorsed, specialty-specific standards—rather than tied to a GME program of fixed duration.

Rationale

Residents vary significantly in how quickly they achieve competency, yet the current system of training all residents for a fixed duration fails to recognize or accommodate this reality. Residents who achieve competency more quickly than their peers must still complete the required period of training, which delays the "delivery" of competent physicians into practice and underutilizes the available pool of GME positions, which is an important societal resource. For residents who develop skills more slowly than their peers, program directors often see the planned completion date as an "up/down" decision, instead of tackling the cultural, regulatory, logistical, financial [as funding from the Centers for Medicare and Medicaid Services is based on duration], and other challenges to extend their training. Thus, routinely aligning the duration of training to individual residents' achievement of competence would support the following results: 1) a more consistent level of skill among physicians entering unsupervised practice; 2) more efficient delivery of competent practitioners to the public; and 3) more responsible use of public funding supporting resident education because more physicians could be trained for the same cost if the remaining funding for sufficiently trained physicians were redirected to the education of others.

Requirements for Implementation

- Residency programs will need the flexibility to accommodate varying numbers of residents or implement a system for filling slots as they become available, i.e., having new residents start at different times throughout the year. (Some anesthesiology programs, for example, already have multiple start and end dates to accommodate individual schedules. This plan could be implemented across specialties—especially in larger programs—to adapt to competency-based duration of residency or fellowship.)
- Nationally standardized assessment methods, using specific milestones (as per the "Milestones Project" now underway), will need to be developed and implemented in each specialty to determine when individuals have achieved the competence necessary for unsupervised practice.
- ABMS and AOA requirements will need to be revised to reflect eligibility for certification based on demonstrated competence, rather than completion of a fixed duration of training.
- Institutions that sponsor GME and external funders, including the government, will need to provide flexible funding to accommodate longer or shorter time periods needed for individuals to complete training.

Because implementation of recommendation III-A will require significant planning, recommendation III-B (below) is suggested as an interim approach.

Recommendation III-B: The defined period of general specialty programs required as a prerequisite to subspecialty training/practice should be evaluated and, where possible, shortened to improve educational efficiency. Opportunities for reducing the required duration of subspecialty fellowship training also should be explored.

All core specialties should define the clinical competencies essential for subspecialists who do not intend to also practice as generalists, and curricula should be revised to focus on these competencies, with a goal of reducing current 3- to 5-year "core" specialty programs by 6 to 12 months.

Rationale

GME is not optimally efficient: time is spent in non-educational activities at all levels of training, and this occurs to some extent in all specialties. Moreover, the current duration of training is not evidence-based. Some specialties, including plastic surgery and thoracic surgery, have shortened the required training; radiology recently reconfigured to allow the final year of residency to focus on subspecialty rather than generalist training.

While training time might be shortened in many or all specialties, reducing the general specialty training of future subspecialists appears to be a logical first step to achieve greater efficiency. Because limits on duty hours have prompted some faculty, particularly in procedure-based specialties, to consider lengthening the training period, an across-the-board reduction of residency program duration is not recommended without further study.

Requirements for Implementation

- ABMS, AOA, and ACGME requirements will need to be revised to reflect the shorter period of generalist training defined for individuals pursuing subspecialty practice within certain specialties. This may require development of a certification status limited to the subspecialty area because the training will not be comparable to that received by generalists who then undertake subspecialty training.

Additional Notes

- Fellowship training can be shortened by distinguishing clinical and physician-scientist tracks and eliminating 1 or more years of required research for fellows pursuing a clinical career.
- Increased educational efficiency achieved through recommendations III-A and III-B has the potential to free up many residency positions within the GME "cap," which should be redirected to entry-level positions that address national workforce needs. We endorse the funding of a national workforce commission to guide the allocation of residency positions by specialty and geography to meet societal needs.

Conclusion IV: Medical education represents a continuum of lifelong learning. Phases and transitions between the phases of medical education should be examined with regard to coordination, efficiency, and appropriate performance assessment.

Recommendation IV-A: For all students a flexible but more rigorous use of the final year of medical school should focus in part on ensuring that the skills and intellectual, technical, and professional development necessary for entering the individual's chosen specialty have been achieved, thereby providing a better transition into GME. Students who have met appropriate milestones might graduate earlier from medical school and enter GME sooner.

Rationale

Many students use significant time in the final year of medical school to "audition" and interview for residency programs and pursue electives, rather than to strengthen their medical education or deepen their learning in a given area. Allowing capable medical students to graduate in less than 4 years after demonstrating "readiness" for GME will accelerate the point at which those physicians can serve the public and will mitigate the educational debt that many students carry.

Requirements for Implementation

- Specific skills expectations would need to be defined at the national level for entry into residency training in each specialty, along with methods for assessing achievement of these skills. As noted in Recommendation IIIA, the logistics of flexible residency start dates would need to be addressed so that positions will be available for medical students who progress to GME faster.

Additional Notes

- Expanding the number of programs that combine medical school and residency training into a shorter duration should be encouraged, and their outcomes should be studied.
- Where milestones have been developed and are met, opportunities to complete "traditional" medical school programs in less than 4 years should be more widely available. The outcomes of these students should be carefully evaluated.

- Regardless of the duration of medical school, the transition from medical school to GME should be marked by rigorous evaluation, documentation of skills required for GME, and close communication about the progress and performance of each new physician between his or her medical school and the GME program.
- Medical school and GME educators will need to collaborate on the development of clear standards for communicating about student preparation for and performance within GME.

Recommendation IV-B: Independent preliminary programs, tracks, and positions should be eliminated. Instead, necessary prerequisite education should be incorporated into each core residency, giving the program director authority and responsibility for the curriculum, organization, and assessment of residents throughout their education in the specialty (thus eliminating unnecessary transitions within GME).

- The related training option of a "transitional year" residency, which has been used to serve a variety of purposes, should be studied to determine whether this option, likewise, provides sufficient value for society and for the trainees.

Rationale

Preliminary programs were designed to provide foundational education in general surgery or internal medicine as a prerequisite for residency training in other fields (such as anesthesiology, neurology, and ophthalmology). In recent years, several specialties have taken greater responsibility for their prerequisite training by incorporating it into a specialty-based residency (including anesthesiology, orthopedics, otolaryngology, and psychiatry). This integration has several demonstrated advantages, including the following:

- Delivery of a curriculum focused on the needs of the specialty.
- Eliminating an unnecessary transition between programs that disrupts the continuity in teaching, evaluation, and mentoring that is so important to professional development.
- Ensuring that trainees have sufficient skills as they take on higher-level, specialty-oriented patient care responsibilities.
- Enhancing educational efficiency by eliminating experiences that are not truly foundational to the resident's specialty.

Also, because preliminary programs are not shaped by detailed requirements designed for a specific specialty (as are the categorical residency programs within which they operate), their content and assignments are more likely to be influenced by non-educational factors, such as service needs or contractual obligations. Putting this training within the purview of specialty program directors, and providing them with ultimate authority over educational content and supervision, would help ensure the quality of the experience.

Requirements for Implementation

- ABMS, ACGME, and AOA requirements will need to be revised to reflect that all training required for a given specialty be incorporated into that specialty's residency program.

Additional Notes

- Best practices can be collected and disseminated from specialties that have already made this transition as data become available.
- Program directors will need to work with each other across specialties to arrange inter-specialty rotations or other learning experiences within the specialty-based residency program.

Recommendation IV-C: A period of "monitored independence" must be provided within GME to confirm each physician's readiness for independent practice.

Rationale

If residents are not afforded sufficient independence or authority for patient care, they may be delayed in developing essential skills, particularly decision-making and technical skills, and may lack confidence in the competencies they have achieved.

Program directors and teaching faculty express widespread concern that residents are not given sufficient opportunity to act independently within the present teaching environment and are consequently

less well prepared for practice. These concerns are most strenuously voiced within procedure-based specialties but extend across multiple disciplines. Some attribute the increasing rates of sub-specialization to residents' insecurity about mastering the breadth of the specialty and their insecurity about readiness to leave the teaching environment without additional training.

Clearly, patient safety and the quality of care must be protected—and supervision is a key part of this—but the interests of current patients (cared for by the resident) must be balanced against the interests of future patients (cared for by the newly independent physician that the resident will become). Within a teaching environment, the review of resident decisions and monitoring of patient progress allows for rapid intervention and "rescue" from suboptimal outcomes to a much greater extent than is possible in the settings where many new GME graduates will practice.

Requirements for Implementation

- Providing residents with a period of "*monitored independence*" before the completion of training will require close and thoughtful supervision throughout training. Direct faculty supervision constitutes a critical element of the education process; observation prompts immediate and specific advice and coaching that could not otherwise be provided. Close supervision is also needed to affirm readiness for monitored independence.

Additional Notes

- The specialty-specific "milestones" and "entrustable professional activities" now being defined by consensus committees in several specialties will provide an important framework for documenting progression throughout training toward competency and readiness for independence.

- Creating a short-term "junior attending" role to follow completion of training might fill a need of some physicians transitioning from GME to practice—especially those who will need to treat complex problems in settings where consultation or assistance from colleagues is not easily accessible. This would allow the new GME graduate to gain additional clinical experience as an attending physician in a consultative-rich environment. The role could also provide value to teaching institutions by allowing for flexible staffing through short-term commitments and an opportunity to "audition" potential future faculty.

Conclusion V: GME must be organized and supported at the institutional and national levels to ensure that residency and fellowship programs are 1) designed and conducted according to sound, broadly-endorsed educational practices, within an environment conducive to education, and 2) given sufficient flexibility to innovate and achieve optimal outcomes.

Recommendation V-A: Empowered educational leaders should ensure that the following educational principles and practices serve as the foundation of GME programs:

- The educational program must be intentionally designed to develop the knowledge, skills, attitudes, and behaviors required for successful current—and future—clinical practice.

- Sufficient continuity of patient care, direct observation, formative feedback, and mentorship are key elements of quality education.

- Autonomy of thought should be maximized throughout training. Autonomy of action should be earned through observed demonstration of clinical skills and professional behaviors.

- Educational value should be determined by how an experience moves the learner along the continuum from novice to expert. To maximize educational efficiency and outcomes, "high-yield" activities should be emphasized and supported. "Low-yield" activities should be identified and eliminated from the curriculum, despite historical or contractual obligations and financial obstacles.

- Regular, systematic program evaluation should be done to ensure continual improvement. This should apply to both accredited and non-accredited programs.

Rationale

The preparation of medical school graduates for independent practice relies heavily on experiential learning through meaningful participation in patient care. Residents and fellows need repeated deliberate practice of activities that constitute essential competencies. Thus, drawing a bright line between

"service" and "education" invokes a false dichotomy. Nevertheless, it is clear that GME trainees are often assigned tasks with limited educational value, which then eclipses other, more educationally rich experiences.

Program directors and institutional GME leaders are primarily responsible for ensuring that the residents' activities advance curricular goals and that the necessary faculty, infrastructure, and other program elements are in place to support high-quality education. However, these educational leaders often lack the necessary authority to accomplish this goal. Meeting trainee, program, and societal needs requires that educational leaders are given sufficient authority and resources, along with the sustained engagement and support of their department chairs, deans, hospital presidents, and system CEOs.

Requirements for Implementation

- The leadership of institutions that sponsor GME [i.e., presidents, CEOs, deans, designated institutional officials (DIOs), and department chairs] must be accountable for the quality of GME. GME metrics should be included among the criteria by which institutional leaders are assessed and their incentives and rewards are determined.

Additional Notes

- Institutional leadership must ensure that GME leaders, including DIOs and program directors, are given sufficient authority and resources to ensure high-quality educational programs, including the authority to determine the sites of training and select the teaching faculty.
- Institutional and GME leadership must together ensure that an environment supportive to education is maintained.

Recommendation V-B: Flexibility should be allowed and encouraged at both the program and individual trainee levels to enhance training for the varied physician roles required to meet the full spectrum of society's health care needs.

- GME programs should have flexibility to tailor their education to specific careers or practice settings as long as they ensure that residents receive effective training to achieve clinical competence, as defined nationally for the given specialty and as assessed by standardized tools. For example, individual programs may wish to enrich their curricula and resident activities to emphasize rural health, global health, physician-scientist, or other career development areas, and to recruit trainees with compatible career goals and faculty with expertise in these areas.
- Residents and fellows should have flexibility to individualize their training toward specific career goals as long as the required elements of clinical competence are achieved as defined nationally for the given specialty and as assessed by standardized tools. This goal can be accomplished by allowing trainees to relinquish an activity after its educational goals and associated clinical and professional competencies have been achieved in order to pursue other educational goals.

Rationale

The predominant model of "one-size-fits-all" GME, reinforced by current certification and accreditation requirements, aims to ensure consistent clinical skills development but at the same time inhibits the development of individual or program-based areas of expertise. Society needs physicians who will devote themselves to the care of patients in different settings—some in academic medical centers and others in underserved areas such as rural health clinics; physician-scientists to provide a bridge between the research bench and patient bedside; and physicians to be leaders in health care policy, quality and safety, and in medical education. Trainees should be allowed to differentiate and should be encouraged to pursue these and other career paths. GME programs should also be able to define the career paths for which they prepare their graduates and document their success in achieving their explicit individual goals.

Requirements for Implementation

This recommendation will require revision of certification requirements to provide greater flexibility so that individual trainees' learning plans can better reflect their career goals. (For example, requirements could maximize flexibility in the use of elective time and allow for part-time training extended over a longer period.) Likewise, accreditation requirements will need to provide flexibility in terms of the process of *how* programs are conducted by increasing and accelerating the emphasis toward outcomes, so that each program's design can reflect its distinctive goals.

Conclusion VI: Health professions education requires a robust body of knowledge— beyond what is currently available—to optimize quality and outcomes.

Recommendation VI: To best leverage the large public investment in medical education for the greatest good to society, a "National Institute of Health Professions Education" should be established and charged with coordinating, prioritizing, and funding research on health professions education, with a substantial focus on GME.

Rationale

Relatively little research is available to guide the education of physicians or other health professionals. This is remarkable given the magnitude of public investment in this education. A centralized mechanism for funding research and coordinating efforts across multiple sites and health professions according to established priorities will result in more productive and cost-effective research and, ultimately, in better trained health professionals and more effective care of patients and populations.

Requirements for Implementation

- Private-public partnerships should be developed to identify funding.
- A national database should be created to track physicians from medical school graduation throughout their careers with respect to their performance, location and type of practice, maintenance of certification, and disciplinary or legal actions. This database could be used to study the outcomes of GME (e.g., various training programs and curricula) as well as GME's impact on workforce needs and distribution.
- Regulatory bodies (including ACGME, ABMS, AOA and its specialty colleges, the Joint Commission, and CMS) need to allow justifiable exemptions from current rules—such as those involving duration of specific educational experiences, duty hours, supervision or billing requirements—for approved research studies.

Additional Notes

- International examples of innovations in health professions education should be compared with those from the United States and considered for possible study and adoption.
- Research into the relationship between the educational attributes of programs and future clinical outcomes of residency graduates should be used to evaluate GME quality and impact.
- Research into the relationship between institutional quality of care and the quality of resident education should be conducted to identify associations that can be used for institutional accreditation.
- Research is needed to develop tools and methods for assessing physician competence to determine when an individual is ready for independent practice and to ensure continued competency throughout each physician's career.
- Other areas in need of research include the following:
    - Indicators of program quality
    - Tools and methods to assess overall clinical competence
    - Optimal length of training
    - The volume and variety of clinical (or simulated clinical) experiences required, on average, to achieve competency
    - Optimal educational team composition and relationships between supervisors and residents
    - Part-time GME options
    - "Re-entry" residency programs and positions
    - Optimal methods for faculty development and tools for faculty evaluation.

ESSENTIAL ELEMENTS OF EFFECTIVE REFORM

Faculty Development

Discussing how to prepare, motivate, evaluate, and reward teaching faculty was beyond the scope of this conference, but the critical need to address these challenges was emphasized. The availability of dedicated and effective faculty is an essential element of GME and must be a key focus of efforts to reform and improve GME.

Faculty development is critical for effective cultural change in GME in areas related to core competencies, competency-based assessment, simulation and instructional technologies, the hidden curriculum, and barriers to teaching. Teaching faculty must better understand the competency framework and its goals, and must develop skills in assessing and providing effective formative feedback to trainees. Along with program directors, faculty must be able to identify resident performance problems and address these with effective remediation.

Faculty must be able to provide clinical supervision that ensures patient safety and high-quality care while supporting residents as they progress toward independent practice—often a difficult balance to strike. They must be able to coach and support residents, in addition to fulfilling the traditional "teacher" role.

In addition, all programs need at least some faculty who are skilled in using educational technologies, such as simulation, to ensure that trainees master skills where experiential learning is limited by patient safety concerns, time constraints, or financial issues.

Finally, GME faculty must be held accountable for their role, responsibilities, and performance as educators, and appropriately rewarded for the important work they do.

Regulation of GME

Accreditation and certification processes must be tuned to foster innovation in GME and promote diffusion of best practices across specialties and among training programs and institutions. Effective implementation of our recommendations will require that accreditation and certification entities rapidly adopt outcomes-based standards and evaluation measures, and diminish time-consuming process measures, as some are already planning to do. This will make it possible to more rapidly design, approve, and pilot well-designed, hypothesis-driven educational innovations, and to more broadly implement those innovations that are most successful. At the same time, the heavy administrative burden that too often distracts GME program directors and faculty from the more educational aspects of their roles, and requires fiscal resources that might be redirected to more fundamental educational needs, must be reduced.

Also, the regulation and oversight of GME that now extends only to accredited programs should apply to non-accredited programs as well. All GME programs—in order to be considered as such—should meet explicit educational standards.

Financing

Finally, ensuring that GME meets the needs of the public will require re-evaluation and revision of the present physician payment and GME reimbursement systems, which exert a dominant influence on specialty choices, the types and locations of institutions participating in GME, and the number and specialty mix of GME positions.

SUMMARY

GME reform is imperative if we are to have a more robust, reliable, and efficient health care delivery system. These recommendations provide a blueprint for achieving greater quality and efficiency in the GME system through closer partnership between the public and the profession, rigorous and transparent assessment, and proactive planning. Expanding the sites and content of GME, learning across specialties and professions, and opportunities for tailoring programs and individual curricula toward specific career goals will better align GME outcomes with societal needs. Competency-based (rather than time-based) transitions into and out of GME will improve the efficiency of GME and ensure that future practitioners are better prepared to deliver high-quality care.

Several of these changes will require national planning and regulatory changes; others will have to be designed and implemented by institutions sponsoring GME. Thus, reform efforts will need to be well coordinated and broad-based. More research focused on health professions education will be required to ensure that the process of GME is continually improved to optimize the outcomes.

It is critical that all GME stakeholders recognize both the urgency and the opportunity of reform. Failing to accomplish necessary change will leave an enlarging gap between society's needs and what the graduates of our GME system can provide. We have the tools, talent, and commitment to accomplish reform of the GME system and must seize this moment to ensure that current and future patients get the care they need and deserve.

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CONFERENCE SUMMARY

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Ensuring an Effective Physician Workforce for the United States: Recommendations for Reforming Graduate Medical Education to Meet the Needs of the Public

The Second of Two Conferences—The Content and Format of GME