American Medical Association

Initiative to Transform Medical Education

Recommendations for change in the system of medical education

June 2007

AMA
AMERICAN
MEDICAL
ASSOCIATION

Table of contents

Summary

A number of recent reports[1-7] have raised concerns about the process and product of the U.S. medical education system, especially the inadequacies in physicians' preparation for practice in a health care system that is newly focused on patient-centered care and on quality and safety. While the U.S. health care system has changed dramatically in the past century—including how care is organized, delivered and financed—changes in physician education and training have been less far-reaching and innovative.

In response to these concerns, the American Medical Association (AMA) launched the Initiative to Transform Medical Education (ITME) in 2005. ITME aims to:

Promote excellence in patient care by implementing reform in the medical education and training system across the continuum, from premedical preparation and medical school admission through continuing physician professional development.

Throughout its planning, ITME has involved many stakeholder groups. Participants at the two ITME working conferences have included representatives from: (1) practicing physicians; (2) medical educators and medical education organizations; (3) payers and purchasers; (4) accreditation, certification and licensure organizations; (5) other health professions; (6) public health; (7) consumer groups and the public; and (8) policymakers, including federal and state government.

ITME consists of three phases:

Phase 1 (2005–2006) identified existing strengths, gaps and opportunities for improvement in physician preparation.

Phase 2 (2006–2007) developed recommendations for change in the system of medical education to address the gaps.

Phase 3 (2007–2010) is now focused on prioritizing needed changes in medical education. With the involvement of appropriate collaborators, specific changes are being selected for implementation.

Based on its work to date, ITME proposes the following overarching recommendations for change in the system of medical education.

Recommendation 1: Apportion more weight in admissions decisions to characteristics of applicants that predict success in the interpersonal domains of medicine. Use valid and reliable measures to assess these traits.

Consider expanding premedical course requirements beyond the biological and physical sciences, for example, by adding requirements in the humanities or social sciences. Develop, validate and utilize new tools in the admissions process to assess relevant personal qualities of applicants (for example, analytic and systems thinking, service orientation, team orientation, commitment to lifelong learning, likelihood of maintaining altruism). Use the interview in a more standardized way to better identify applicants with desirable characteristics, but also consider alternatives to the standard interview, such as group interviews, that would better allow the applicant to demonstrate desirable characteristics. Admission to residency training also should take into acount these desirable characteristics.

Recommendation 2: Consider creating alternatives to the current sequence of the medical education continuum, including introducing options so that physicians can re-enter or modify their practice.

Develop flexible and cost-efficient mechanisms to allow physicians who have left practice, or who have had their practice interrupted, to have their continued competency assessed. Develop mechanisms for physicians identified as needing additional training for re-entry or remediation to obtain this education in a time- and cost-efficient manner, such as through focused mini-residencies. Develop educationally sound programs for physicians who wish to change the focus of their practice midcareer. Ensure that licensure and certification requirements do not impose unreasonable time and

cost barriers to physician re-entry and practice change. Consider how the educational continuum could be structured to reduce the overall length of initial training.

Recommendation 3: Introduce core competencies across the medical education continuum in new and expanded content areas that are necessary for practice in the evolving health care system.

Develop and implement longitudinal education in core competencies across the continuum, including information acquisition and application, self-assessment, professionalism, and specialized communication skills. Integrate these core competencies into the teaching program at all levels, in a way that illustrates their relevance. Consider what should be removed from the curriculum, as well as what should be added, to ensure that curriculum overload is minimized. Create learning materials to support education in these competency areas and develop/implement new or enhanced approaches to teaching, such as the use of simulation. Ensure that practicing physicians have or are granted time to participate in education, including formal educational sessions and self-learning, and that such education does not impose a serious financial burden on physicians.

Recommendation 4: Introduce new methods of evaluation (such as multi-source evaluations, self- and peer assessment, and competency-based assessment) that are appropriate to assess the core competencies.

Ensure that the new methods of evaluation reliably assess desired characteristics both of physicians-in-training and of physicians. Provide opportunities for formative evaluation (self-assessment for the purpose of improvement). Introduce summative evaluations at milestone points in the educational continuum. Ensure that evaluation supports, and does not stifle, needed educational innovation and change.

Recommendation 5: Ensure that faculty at all stages of the educational continuum are prepared to teach new content, employ new methods of teaching and evaluation, and act as role models for learners.

Make the provision of faculty development an institutional expectation. Ensure that faculty development is available for both new and experienced faculty. Consider expanding the pool of teachers to include individuals with important new content expertise (for example, public health, economics, social sciences).

Recommendation 6: Ensure that the organizational environment in medical schools and teaching hospitals tangibly values and rewards participation in education.

Provide appropriate financial and other incentives for faculty to participate in educational planning and delivery, as well as in faculty development. This includes release time and salary support for participation in education and explicit consideration of educational planning, delivery and research in promotion and tenure guidelines.

Recommendation 7: Ensure that the learning environment throughout the medical education continuum is conducive to the development of appropriate attitudes, behaviors and values, as well as knowledge and skills.

The formal curriculum is designed to teach trainees the knowledge and skills to function as competent physicians. However, trainees also learn from faculty role models and through informal interactions with members of the health care team. Attention must be paid to these characteristics of the learning environment to ensure that the environment supports physicians' development of appropriate core attitudes, behaviors and values.

Recommendation 8: Enhance coordination among accreditation, certification and licensing bodies.

During the 20th century, medical education grew by accretion. Specialty training after medical school (graduate medical education) was added to recognize the need for advanced training in a particular specialty field. Continuing professional development (continuing medical education) emerged in response to the rapid growth in knowledge and the resulting need for lifelong learning. Each phase of education has, in general, functioned in relative isolation from the others, and the educational regulatory systems of accreditation, certification and licensure have mirrored this patchwork design. There needs to be enhanced communication and coordination among these bodies to support the creation of a true educational continuum.

Recommendation 9: Support enhanced funding for medical education research, planning and delivery across the continuum.

Advocate for funding to support needed changes in medical education across the continuum. Identify new funding sources to support medical education research and development and the implementation of innovative programs. Enhance existing and develop new mechanisms to reduce the significant debt burden that medical students accumulate so that the high costs of medical education do not exclude qualified applicants from pursuing a medical career or selecting a desired specialty. At the level of the physician in practice, there should be consideration of how best to fund continuing professional development (continuing medical education), so as to eliminate the potential for commercial bias.

Recommendation 10: Evaluate the effectiveness of changes in the medical education system based on their outcomes.

The results of changes in the system of medical education should be evaluated for their feasibility and utility, as well as for learning outcomes. This assessment should also include the effects of the changes on eventual practice and patient outcomes.

ITME stresses that implementing a change in any one of these areas alone likely will not result in the desired outcome. True reform of medical education requires a comprehensive rethinking of the education system, which includes all of these elements.

Background

According to many quantitative indicators, U.S. medical education is doing well. For example, most individuals who enter U.S. medical schools will eventually graduate. U.S. graduate medical education attracts physicians from around the globe. Most physicians who complete training obtain and retain a license to practice medicine, and the great majority currently obtain certification by a medical specialty board.

However, serious concerns have been expressed about the process and product of the U.S. medical education system.[1-7] Many of these concerns have focused on inadequacies in physicians' preparation for practice in the evolving heath care system, including the need for more of a patient and quality/safety focus. While the U.S. health care system has changed dramatically in the past century, including how care is organized, delivered and financed, changes in physician education and training have been less far-reaching and innovative.

This report describes the results, to date, of a comprehensive initiative aimed at addressing the significant gap between the outcomes of medical education and the needs of the practice environment. The core principle underlying this American Medical Association (AMA) sponsored initiative is that safe, quality medical care is ultimately dependent on a well-educated physician work force.

The Initiative to Transform Medical Education (ITME) is grounded in work by the AMA Council on Medical Education. At its 2002 Annual Meeting, the AMA House of Delegates adopted a Council on Medical Education report titled "Comprehensive Reform at the Interface of Medical Education and Health Care." This report recommended a comprehensive initiative with the following desired outcomes:

▼ The creation of a system of medical education that better equips young physicians with the knowledge, skills, attitudes and values necessary to provide quality medical care and the ability to continually update their learning

▼ The availability of appropriate resources, including funding, faculty, clinical sites and technology, to support needed changes in medical education across the continuum

The report recommended an iterative process to bring about medical education change, involving participation by a widening circle of stakeholder groups.

To prepare for a comprehensive initiative, the AMA Council on Medical Education reviewed a number of reports and commentaries describing problems with the current education of physicians. Although critiques of medical education come from a variety of perspectives, there are a number of similarities in the gaps that have been identified. The following illustrates some of these problems and the general remedies that have been proposed.

▼ *Need to enhance health system safety and quality.* Landmark reports by the Institute of Medicine identified problems with health care quality and safety.[1-3] Among the deficits were the inability of health professionals to work smoothly in teams and to efficiently share information related to patient care. The solutions proposed for these gaps included change in the education of physicians and other health professionals, such as enhanced opportunities for team-based learning and increased availability of information technology, such as electronic medical record systems.[2-3]

▼ *Need for enhanced emphasis on education in training institutions.* Institutions that train physicians, such as academic health centers, are under increasing strain based on changes in the environment in which health care is delivered.[4] These financial and other stresses have resulted in a decreased emphasis on the educational mission. For example, faculty have become less available to plan and implement needed educational changes that would, in turn, prepare physicians to deliver "the arts and sciences of health care essential to the changing needs of society."[5] Reform of medical education requires

that priorities within teaching institutions and society in general shift to provide more resources for educational innovation.[5,6]

▼ *Inadequacy of physician preparation in new content areas.* Concerns exist that physicians-in-training are not being equipped with all the knowledge and skills needed to prepare them for current practice.[7] This includes adequate training in specific content areas, such as physician-patient communication,[8] as well as in certain skills, such as the ability to obtain and apply evidence-based information in the context of patient care.[9]

This background helped to frame the plans for ITME. A leadership group was formed from groups within the AMA, including the Board of Trustees, Council on Medical Education, Section on Medical Schools, Resident and Fellow Section, and Medical Student Section. The leadership group first articulated the overall goal for ITME and then designed the process by which ITME would function.

ITME—the goal

The ITME goal is to:

Promote excellence in patient care by implementing reform in the medical education and training system across the continuum, from premedical preparation and medical school admission through continuing physician professional development.

Promote excellence in patient care

In the current health care system, excellence in patient care includes expectations that the physician has the ability to efficiently deliver safe care, to measure and improve patient outcomes, and to communicate appropriately with diverse patient populations. The education and training system must ensure that physicians-in-training and physicians in practice acquire and demonstrate these skills.

The medical education and training system

Transformation of medical education must include, but not be limited to, changes in what is taught, and where and how teaching occurs. Successful reform also requires attention to factors that influence the educational process, including faculty reward systems, the attitudes and values displayed by supervisors and peers as part of the learning environment,

and the financing of medical education and health care. All these areas in the teaching institution and the external environment contribute to the success of the medical education system.

The educational continuum

Reform must occur throughout the medical education continuum (medical school, residency training and continuing professional development). This will require coordination among all phases of the continuum so that the learner will systematically acquire, maintain and improve the requisite knowledge, skills, attitudes and values characteristic of a competent physician. Change occurring only in one phase of the continuum likely will not result in the desired outcome.

The focus of ITME is on the preparation of physicians to deliver safe, quality medical care. While physicians have other professional responsibilities—for example, as researchers, administrators and teachers—most spend at least some portion of their time providing care to patients. It is this specific role that has raised the most concern among advocates for medical education reform. Specifically, ITME is concentrating on the adequacy of physician preparedness to:

▼ Interact with patients.
▼ Function effectively and efficiently within their own health care organizations and the entire health care system.
▼ Act as a caring professional in society.

As ITME is directed at educational reform, it will not work directly to bring about salutary health system change. However, positive health system changes may result as a consequence of addressing any current gaps in the preparation of physicians.

ITME—the process

From its inception, ITME has involved a broad array of stakeholder groups, including:

▼ Practicing physicians
▼ Medical educators and medical education organizations
▼ Payers and purchasers
▼ Accreditation, certification and licensure organizations
▼ Other health professions
▼ Public health

▼ Consumer groups and the public

▼ Policymakers, including the federal government and the states

The ITME process, which began in mid-2005, consists of three phases. Phases 1 and 2 have been completed, and Phase 3 is under way.

Phase 1 (2005–2006) identified strengths in the preparation of physicians, as well as gaps and opportunities for improvement. Additionally, there was attention devoted to identifying positive and negative characteristics of the training system.

Phase 2 (2006–2007) selected gaps that were amenable to change and created strategies for addressing them. This included developing specific plans for change, identifying barriers that must be overcome in order for change to occur, and identifying stakeholder groups that could support or potentially oppose the changes.

Phase 3 (2007–2010) involves working with appropriate collaborators to prioritize needed changes in medical education. Specific recommendations for change are being selected with the goal of rapid, effective implementation, including the development of model programs, where relevant and feasible. As appropriate, the results will be evaluated to determine their feasibility and broad applicability.

Phase 1: Identification of strengths and gaps in physician preparation

In addition to a review of relevant reports and published literature on medical education reform, Phase 1 included the first ITME working conference (December 2005). About 40 representatives from the stakeholder groups listed previously worked in small groups to identify strengths, gaps and opportunities for improvement in physician preparation. Despite the wide differences in participant background, there was considerable similarity in the issues that were identified.

A summary list of strengths and gaps/opportunities for improvement was generated from the conference. This list was reviewed by the conference participants and shared with other groups in the medical education community. Feedback from this review process resulted in a final list, which is presented below.

Strengths in physician preparation

The following were identified as strengths in the current preparation of physicians:

▼ *Physicians are knowledgeable and technically proficient.* Physicians are knowledgeable about and technically proficient in providing care for acute disease, but less so for chronic conditions.

▼ *Physicians wish to do what is best for their patients.* There is a strong commitment by the physician to the care of his/her individual patients.

▼ *Patients respect physicians as credible sources of information.*

Gaps/opportunities for improvement in physician preparation

The following general areas for improvement were identified in the current preparation of physicians.

▼ *"Treating" the heath care system*
There are gaps in physicians' preparation to "diagnose and treat" problems in their own health care organizations and in the health care system. This includes the ability to engage in a continuous quality improvement approach to system evaluation and improvement at a macro level (the health care system) and micro level (within their own health care organization). Specifically, physicians are not prepared to evaluate the care they provide in their own practices and to use the results to improve patient safety and the quality of care provided.

▼ *Serving as advocates for patients*
Physicians are generally not prepared to be advocates for patients on issues related to social justice (for example, elimination of health care disparities, access to care) and to be citizen leaders inside and outside of the medical profession. This also includes engaging in advocacy on public health issues.

▼ *Losing altruism and the caring aspects of medicine*
Physicians often lose altruism and qualities of caring as they proceed through training and enter the practice environment. Applicants to medical school and residency training are selected for their abilities to acquire knowledge and to problem-solve, and our current system of medical education reinforces these traits. This may lead physicians to perceive patients simply as sources of data and "problems to be solved," instead of as individuals in need.

▼ *Dealing with uncertainty*
Physicians are trained to believe it is important to have "the answer." They are expected to convey this impression to supervisors while in training and subsequently behave this way with patients and colleagues when they are in practice. This makes it difficult for physicians to deal with the inevitable uncertainty arising from incomplete or conflicting information. Additionally, they are not typically prepared to convey their uncertainty when interacting with patients and colleagues.

▼ *Managing information*
In the context of the rapidly expanding knowledge base, many physicians are not prepared to rapidly acquire, evaluate and synthesize information in the context of care for an individual patient. While there are generational differences, many physicians are not prepared to utilize information technology to assist in information acquisition and management. Further, they are not prepared to develop and carry out their own lifelong learning curriculum, including identifying their own learning needs and establishing learning goals to meet these needs.

▼ *Expecting to be autonomous*
Physicians are socialized to be "in charge" and act as autonomous decision-makers in the care of patients. This philosophy can be a barrier to providing patient-centered care, where patient values and desires are an integral part of shared decision-making. Physicians need additional preparation in balancing their own values and expectations with those of their patients, while taking into account changing societal needs and expectations.

This expectation of autonomy starkly contrasts with increasing requirements for physicians to be more accountable to various constituencies, including the public, payers and government. Physicians must continue to take a leadership role in professional self-regulation or that privilege will be threatened and diminished.

Lastly, the expectation of autonomy diminishes the ability of physicians to act as team players with other physicians and other health professionals. They may be reluctant to learn from other professions and disciplines and to work with others as partners in the care process, which may hamper the care that is provided to patients.

▼ *Balancing the patient and population perspectives*
Physicians are prepared to do what they believe is best for individual patients. They are not, however, prepared to participate in ethical and political discussions about the allocation of health care resources, which are not limitless.

▼ *Exercising skills in communication with patients*
Physicians need additional preparation in communicating with patients about difficult issues, such as those related to death and dying. There is a need to expand skills in cultural competence/awareness and to recognize that some patients may have health literacy issues.

Additional gaps and opportunities for improvement in the medical education system were identified:

▼ *Absence of a true educational continuum*
The system of medical education in the United States often is referred to as a continuum encompassing medical school (undergraduate medical education), residency and fellowship training (graduate medical education), and continuing professional development (continuing medical education). While the physician does progress through each of these stages of professional development, the stages have developed and are "regulated" in isolation. There are separate accrediting bodies for each phase of the continuum, so there is little incentive for joint planning and curriculum coordination across phases. The evaluation of learners also occurs with less coordination than is desirable, so it is difficult to ensure that learners are moving toward mastery in a systematic way. This is especially the case for practicing physicians.

▼ *Limitations in educational and career pathways*
The total length of training from medical school through fellowship continues to increase, based primarily on the addition of multiple new subspecialty areas. The current structure of the medical education system constrains physicians to participate in such advanced training at the beginning of their career. Current regulatory guidelines (licensure, certification and credentialing) affect the ability of physicians to make midcareer adjustments (such as re-entry after a period out of practice and specialty or practice changes) based on personal circumstances or changes in how health care is delivered. In general, there are limited pathways for practicing physicians who leave practice for a period to re-enter.

Phase 2: Solutions to address gaps in the preparation of physicians

Phase 2 of ITME aimed to address 11 specific gaps in physician preparation or in the characteristics of the medical education system that were based on the results of Phase 1. Plans for changes in the system of medical education to address each gap were developed at the second ITME working conference* (September 2006). The approximately 100 participants came from the same stakeholder groups as participated in Phase 1. See the Appendix for a participant list.

For the second ITME working conference, participants were divided into 11 small groups, each of which was assigned a specific gap/problem area from Phase 1. Each group included representation from multiple stakeholder groups, but also expertise in its specific assigned gap/problem area. During the two-day conference, participants: (1) identified changes in one or more phases of the medical education continuum to address the gap; (2) prioritized the recommended changes, based on perceived impact and feasibility; (3) identified barriers to implementation of their recommended changes; and (4) determined which stakeholder groups would have impact on the change process, including those that would support the change, be neutral to the change and oppose the change.

In order to address each specific gap, participants were asked to consider whether the gap/problem area could best be addressed through change in one or more of the following areas:

▼ Premedical preparation (such as required courses) and the process for the selection of medical students and resident physicians

▼ The educational program for medical students and residents, including both the formal curriculum and the learning environment (such as the attitudes/values displayed by teachers and other role models)

▼ The process and content of continuing physician education/professional development

▼ The "regulatory" environment of medical education, including accreditation, certification and licensure

▼ The system of financing undergraduate, graduate and continuing medical education

▼ The support systems created within health care organizations (for example, information systems, error reporting systems)

Priority changes in the medical education system to address specific gaps

Following are the changes recommended by each group to address the 11 listed gaps/problem areas considered during the second ITME working conference.

1. Physicians are not prepared to evaluate their own practice and to use the results of the evaluation to improve the quality of care and patient safety.

▼ Create financial incentives in the educational and reimbursement systems that support attention to quality and safety.

▼ Introduce changes in certification, licensure and credentialing/privileging to stimulate education in and assessment of safety and quality.

▼ Develop and introduce opportunities for self-directed learning (continuing education) for practicing physicians that promote quality improvement and safety. This could include expanded use of new educational formats, such as performance improvement continuing medical education.

2. Physicians are not prepared to function in a health care system that requires practice to be efficient and evidence-based.

- Select for, teach and reinforce new skills that are related to evidence-based, efficient practice, including time management, teamwork, delegation and ability to work through problems.

- Provide tools to assist physicians, such as real-time decision-support systems that have been developed to be evidence-based.

- Provide incentives/rewards, such as continuing medical education credit, for "just in time" learning. Provide payment incentives for evidence-based practice.

3. Physicians are not prepared to participate in decisions about the just allocation of finite health care resources and to be advocates for patients related to issues of social justice (for example, elimination of health care disparities, access to care).

- Consider the addition of premedical course requirements in the social sciences (such as sociology, economics, public health).

- Include issues related to social accountability among admissions criteria. Refine admissions tools, such as the interview, to include a focus on such issues. Ensure that interviewers are prepared to address this issue during the interview.

- Revise the medical school and graduate medical education curriculum to include new/expanded content areas, such as service learning, payer systems, health system design/other health care systems. Involve faculty from other schools (such as public health, university departments) in teaching.

4. Physicians lose altruism and the caring aspects of medicine as they proceed through training.

- Emphasize service in admissions criteria and throughout training. Consider providing opportunities for voluntary (or mandatory) service directed at meeting patient needs.

- Create an integrated, longitudinal curriculum from premedical education through continuing professional development in humanism, ethics and professionalism. Support the development and implementation of this curriculum with funding and appropriate time allocations for teachers and learners. Address the "hidden curriculum."

5. Physicians are trained to convey the impression that they have "the answer," so they are not prepared to deal with the inevitable uncertainty arising from incomplete or conflicting information or to convey their uncertainty to patients.

- Select for and support/reinforce the ability to recognize and acknowledge uncertainty across the educational continuum.

- Develop teaching and assessment, including self-assessment, tools related to dealing with uncertainty. Create support systems to help physicians find answers to assist them in decision-making.

- Change evaluation systems for physicians-in-training and practicing physicians to permit acknowledgment of uncertainty.

6. Physicians are not prepared to develop and carry out their own lifelong learning curriculum.

- Assess applicants to medical school on characteristics that predict the capacity and motivation for lifelong learning.

- Develop tools that can be used by learners across the continuum to identify their own learning needs. Prepare learners at each stage of the continuum to use these tools.

- Develop collaborations between academic medical centers/teaching sites and the continuing medical education community to create educational opportunities that support re-entry, remediation and practice change for individual physicians. Eliminate the barriers to physicians at all career stages making such changes.

7. Physicians are not prepared to rapidly acquire, evaluate and synthesize information in the context of the care of individual patients.

- ▼ Ensure that faculty (not just physicians) are able to teach and model this skill.

- ▼ Develop information support systems for physicians, care teams and patients. Teach the use of these systems across the continuum. Ensure that physicians-in-training have mastered the use of information support systems (such as electronic medical records).

- ▼ Ensure that information support systems are used in all health care settings and that the systems are designed so that information can be shared.

8. Physicians are selected and trained for the ability to acquire knowledge and to problem-solve, to the exclusion of the qualities of caring and the ability to see patients as individuals in need.

- ▼ Shift the emphasis in the admissions process away from quantitative measures that assess science-based knowledge. Develop valid and reliable tools to assess humanism, altruism and related qualities during the admissions process.

- ▼ Teach toward core competencies related to professionalism and qualities of caring during medical school and residency training. Create valid and reliable measures to assess the attainment and demonstration of these competencies. Continue to assess for these qualities during practice.

- ▼ Provide faculty development and incentives to change the learning environment to support the learner's development of the core professionalism competencies.

9. Physicians are not prepared to be team players with other physicians and health professionals.

- ▼ Assess readiness for and skills of team-based learning at admissions and continue to assess these skills throughout training and practice. Incorporate new assessment methods, such as multi-source evaluation and team-based grades.

- ▼ Change the organizational culture of education and practice sites to support team learning and practice. For example, create an environment in teaching institutions that supports effective team functioning, such as rewards for team outcomes.

10. Physicians are not prepared to deal with difficult communication issues, such as disclosing or apologizing for errors in patient care or demonstrating cultural competence/awareness.

- ▼ Change admissions criteria to give greater weight to emotional intelligence, reflection, self-awareness and other relevant traits. Create/identify and implement valid and reliable measures of these traits.

- ▼ Develop teaching tools specifically related to difficult and complex communication skills. Ensure that students and residents have supervised experience (real and/or simulated) in difficult communication situations.

- ▼ Introduce/expand evaluation instruments and methods that specifically assess complex communication skills across the continuum of medical education and practice, such as objective structured clinical examinations and other simulation methods.

11. Physicians are not able to make midcareer adjustments (such as re-entry to practice and specialty or practice change) as a result of personal circumstances or changes in how health care is delivered.

- ▼ Create competency-based methods for self-assessment. Ensure that the assessments use methods that are valid and reliable. Provide educational opportunities for physicians to remedy gaps and to update their knowledge and skills.

- ▼ Encourage collaboration among organizations responsible for licensure, credentialing and certification to create a common set of requirements for re-entry and retraining.

- ▼ Create financing mechanisms to support physician retraining/remediation.

Recommendations for change in the medical education system

The changes proposed to address the 11 specific gaps/problem areas have a number of areas of similarity. The following 10 recommendations represent a comprehensive synthesis of the changes and are aimed at addressing all the factors that ITME believes must be considered if change is to be successful. Note that not all the recommendations apply to each gap/problem area.

Recommendation 1: Apportion more weight in admissions decisions to characteristics of applicants that predict success in the interpersonal domains of medicine. Use valid and reliable measures to assess these traits.

Consider expanding premedical course requirements beyond the biological and physical sciences, for example, by adding requirements in the humanities or social sciences. Develop, validate and utilize new tools in the admissions process to assess relevant personal qualities of applicants (for example, analytic and systems thinking, service orientation, team orientation, commitment to lifelong learning, likelihood of maintaining altruism). Use the interview in a more standardized way to better identify applicants with desirable characteristics, but also consider alternatives to the standard interview, such as group interviews, that would better allow the applicant to demonstrate desirable characteristics. Admission to residency training also should take into acount these desirable characteristics.

Recommendation 2: Consider creating alternatives to the current sequence of the medical education continuum, including introducing options so that physicians can re-enter or modify their practice.

Develop flexible and cost-efficient mechanisms to allow physicians who have left practice, or who have had their practice interrupted, to have their continued competency assessed. Develop mechanisms for physicians identified as needing additional training for re-entry or remediation to obtain this education in a time- and cost-efficient manner, such as through focused mini-residencies. Develop educationally sound programs for physicians who wish to change the focus of their practice midcareer.

Ensure that licensure and certification requirements do not impose unreasonable time and cost barriers to physician re-entry and practice change. Consider what should be removed from the curriculum, as well as what should be added or modified, and how the educational continuum could be structured to reduce the overall length of initial training.

Recommendation 3: Introduce core competencies across the medical education continuum in new and expanded content areas that are necessary for practice in the evolving health care system.

Develop and implement longitudinal education in core competencies across the continuum, including information acquisition and application, self-assessment, professionalism, and specialized communication skills. Integrate these core competencies into the teaching program at all levels, in a way that illustrates their relevance. Consider what should be removed from the curriculum, as well as what should be added, to ensure that curriculum overload is minimized. Create learning materials to support education in these competency areas and develop/implement new or enhanced aproaches to teaching, such as the use of simulation. Ensure that practicing physicians have or are granted time to participate in education, including formal educational sessions and self-learning, and that such education does not impose a serious financial burden on physicians.

Recommendation 4: Introduce new methods of evaluation (such as multi-source evaluations, self- and peer assessment, and competency-based assessment) that are appropriate to assess the core competencies.

Ensure that the new methods of evaluation reliably assess desired characteristics both of physicians-in-training and of physicians. Provide opportunities for formative evaluation (self-assessment for the purpose of improvement). Introduce summative evaluations at milestone points in the educational continuum. Ensure that evaluation supports, and does not stifle, needed educational innovation and change.

Recommendation 5: Ensure that faculty at all stages of the educational continuum are prepared to teach new content, employ new methods of teaching and evaluation, and act as role models for learners.

Make the provision of faculty development an institutional expectation. Ensure that faculty development is available for both new and experienced faculty. Consider expanding the pool of teachers to include individuals with important new content expertise (for example, public health, economics, social sciences).

Recommendation 6: Ensure that the organizational environment in medical schools and teaching hospitals tangibly values and rewards participation in education.

Provide appropriate financial and other incentives for faculty to participate in educational planning and delivery, as well as in faculty development. This includes release time and salary support for participation in education and explicit consideration of educational planning, delivery and research in promotion and tenure guidelines.

Recommendation 7: Ensure that the learning environment throughout the medical education continuum is conducive to the development of appropriate attitudes, behaviors and values, as well as knowledge and skills.

The formal curriculum is designed to teach trainees the knowledge and skills to function as competent physicians. However, trainees also learn from faculty role models and through informal interactions with members of the health care team. Attention must be paid to these characteristics of the learning environment to ensure that it supports physicians' development of appropriate core attitudes, behaviors and values.

Recommendation 8: Enhance coordination among accreditation, certification and licensing bodies.

During the 20th century, medical education grew by accretion. Specialty training after medical school (graduate medical education) was added to recognize the need for advanced training in a particular specialty field. Continuing professional development (continuing medical education) emerged in response to the rapid growth in knowledge and the resulting need for lifelong learning. Each phase of education has, in general, functioned in relative isolation from the others, and the educational regulatory systems of accreditation, certification and licensure have

mirrored this patchwork design. There needs to be enhanced communication and coordination among these bodies to support the creation of a true educational continuum.

Recommendation 9: Support enhanced funding for medical education research, planning and delivery across the continuum.

Advocate for funding to support needed changes in medical education across the continuum. Identify new funding sources to support medical education research and development and the implementation of innovative programs. Enhance existing and develop new mechanisms to reduce the significant debt burden that medical students accumulate so that the high costs of medical education do not exclude qualified applicants from pursuing a medical career or selecting a desired specialty. At the level of the physician in practice, there should be consideration of how best to fund continuing professional development (continuing medical education), so as to eliminate the potential for commercial bias.

Recommendation 10: Evaluate the effectiveness of changes in the medical education system based on their outcomes.

The results of changes in the system of medical education should be evaluated for their feasibility and utility, as well as for learning outcomes. This assessment also should include the effects of the changes on eventual practice and patient outcomes.

ITME stresses that implementing a change in any one of these areas alone likely will not result in the desired outcome. True reform of medical education requires a comprehensive rethinking of the education system, which includes all of these elements.

Barriers to change

During the second ITME working conference, small groups also identified barriers that must be overcome in order to successfully introduce and maintain recommended changes. The following summarizes the categories of barriers that were identified by at least some of the groups. These barriers should be considered in planning for change in any phase of the educational continuum.

▼ *Barriers at the level of individual system participants*
Resistance to change is a substantial barrier. Resistance may arise from personal characteristics and/or may be a result of factors at the organizational or environmental levels, for example, the individual's response to what the organization values and rewards. Resistance can exist at the level of both the teacher and the learner, so both perspectives must be addressed in planning for change.

Limited expertise among individuals in the medical education system is a barrier to carrying out some of the recommended changes. Overcoming this requires increasing the availability of expertise in new content areas and in new evaluation methods through faculty development or the recruitment of faculty with additional skills. There also may be limited knowledge about the strategies to successfully bring about change and to support innovation. Planning should include a consideration of the literature from other disciplines on how to bring about change successfully.

Many of the "tools" that individuals would need to use to implement desired changes do not exist. This includes such things as a uniform electronic medical record and other information support systems. Other types of tools that would support the teaching and assessment of new competencies also are not available. For example, while excellent testing mechanisms exist to assess cognitive knowledge, valid and reliable instruments to evaluate personal characteristics in the admissions process and during training are not generally available.

▼ *Barriers at the organizational level*
There may be an organizational climate that does not support change. If education is not a priority at the institutional level, faculty with needed expertise to support educational innovation may not be hired or retained. Instead, hiring decisions may be made based solely on research or clinical care priorities.

The organizational climate also may not value or support faculty development. Release time and funding for faculty to increase their skills in education may not be available. Experts in educational research, planning and evaluation may not be available on site.

The institutional reward system may not sufficiently value educational research, planning and delivery in the faculty promotions process, which discourages participation. Faculty time for education may not be protected with salary support, so that income is lost by the faculty member's participation in education. Change will not be acceptable if it comes as an "unfunded mandate" or imposes significant additional burdens on the organization or its members.

The current structure of the teaching program at the medical school and residency program levels may be a barrier to change. The medical school curriculum, for example, is highly compressed, and time for the addition of new subject areas is limited. Limitations on resident physician duty hours may also affect the availability of time for teaching sessions.

Finally, the infrastructure of the teaching institution may not support change. Absence of resources such as adequate teaching space or information systems may make needed change difficult.

▼ *Barriers at the environmental level*
The current financing mechanisms for medical education across the continuum do not support innovation and broad-based educational change. For example, there is limited funding for medical education research and for new program implementation. Financing mechanisms often require that time for education is cross-subsidized from other funding streams.

In addition, the regulatory system, and for medical education—accreditation, certification and licensure—are not coordinated within and across phases of the continuum. This makes for potentially mixed messages, so that competencies are not systematically taught and evaluated as the physician proceeds through training and into practice.

Finally, numerous factors in the health system can act as barriers to change in medical education. These include the organization and financing of health care and infrastructure issues, such as the general absence of health information systems. For ITME to be successful, it must address educational change in the context of the parallel health system changes that will be required.

All these barriers can only be overcome through the broad-based action of individuals and groups within and external to the medical education community. This requires a comprehensive consideration of which stakeholders to involve in bringing about change.

Stakeholder groups to involve in bringing about change

For each gap/area for improvement, participants at the second ITME working conference listed and prioritized the stakeholder groups that could facilitate and those that could impede implementation of desired changes. While the specific collaborators that were identified varied with the type of gap/area for improvement, there was general consensus that broad-based participation was necessary for meaningful change to occur. The following is a summary of the general categories of stakeholders who were cited as important to involve in bringing about one or more of the recommended changes. The specific organizations and groups listed are meant as examples.

▼ *Individual teachers and learners, including students, residents and practicing physicians.* There must be explicit acceptance of the change by those who will implement it and by those who will be affected by it. Participation of individuals who will be affected is, therefore, critical in planning for change.

▼ *Educational program leadership.* Include individuals with local responsibility for educational programs at all levels of the continuum—for example, deans and their staff, department chairs, and residency program directors. These individuals have high credibility as well as detailed knowledge of their own organizations.

▼ *Institutional officials at clinical sites.* Clinical site administrators (hospital directors) and faculty/physician practice administrators are critical to ensure that proposed changes can be implemented in teaching institutions and that appropriate faculty are available to participate. They also may provide financial and other resources. Institutional leaders at the medical staff level also set requirements for credentialing and privileging.

▼ *Accreditors.* Organizations that accredit educational programs/providers at all levels of medical education—undergraduate (Liaison Committee on Medical Education), graduate (Accreditation Council for Graduate Medical Education) and continuing (Accreditation Council for Continuing Medical Education)—along with accreditors of health care organizations (Joint Commission), are important in that they set expectations at the level of the medical education system.

▼ *Certifying and licensing bodies.* Physicians-in-training and physicians demonstrate their knowledge and skills through the examinations and other assessments used for licensure and certification. These assessments define, at a national level, the requirements for entry into and continuation in practice. Therefore, it is critical to include the organizations responsible for setting these standards: the American Board of Medical Specialties and its member boards, the Federation of State Medical Boards and state medical licensing boards, and the National Board of Medical Examiners.

▼ *Medical education and related associations.* National organizations serve as forums to bring individuals together and to serve as the voice of the profession and the medical education community to external groups. These include associations representing the medical profession and medical students at the national and state levels (the AMA, the American Osteopathic Association, the American Medical Student Association, the National Medical Association, the National Hispanic Medical Association, state medical associations); medical schools and teaching hospitals (the Association of American Medical Colleges, the American Association of Colleges of Osteopathic Medicine, the American Hospital Association); and medical specialties (Council of Medical Specialty Societies, medical specialty societies).

▼ *Leaders and representatives from other health professions.* If quality and safety in health care depends on the smooth functioning of the health care team, then representatives from other health professions should be involved in planning for medical education change. Ideally, for the maximum effect there should be coordinated planning for educational change across health professions.

▼ *Representatives from other disciplines.* Expertise from individuals in other disciplines (such as sociology, ethics, economics, public health) will be needed in the design of curriculum changes. Expertise also will be needed in organizational change, educational sciences (testing and measurement, instructional development), and information technology to develop and implement the necessary tools and other supports needed for change to occur.

▼ *Premedical advisers.* Premedical advisers will be critical in creating the interface between premedical and medical education. This includes identifying the prerequisites

necessary for admission and getting this information out to schools/colleges and potential applicants. The National Association of Advisors for the Health Professions and other groups of pre-professional advisers have a central role in the change process.

▼ *Payers for health care and for education.* Public (federal and state) and private sector payers for health care and education, including those involved in new funding paradigms (for example, pay for performance), should participate so that incentives are appropriately aligned.

▼ *Purchasers.* National business groups on health, unions and other large purchaser systems should participate so as to contribute information about expectations.

▼ *Patients and the public.* Participation by patients and members of the public will be important both to identify competencies expected of physicians and to evaluate whether changes have had an impact on quality of care and satisfaction. While sampling from members of the public in general is difficult, organizations representing broad segments of the public or of patients should be selected to participate.

To be successful, the need for change must be accepted at the level of individual institutions (such as medical schools and teaching hospitals) and also at the level of the medical education system as a whole. Institutional-level changes require support from leaders (formal and informal) as well as from organizational members (such as faculty, staff and learners). At the system level, change requires action by regulatory bodies, such as accreditors, certifying bodies and licensing boards, as well as by funders. Those who utilize and pay for the services of physicians must understand and support educational system change as in the best interests of the health care that is delivered.

Phase 3: Next steps for ITME—program implementation

In the short term, ITME is beginning a series of implementation activities based on the results of Phase 2. Coordinated by the ITME leadership group and the AMA Council on Medical Education, program design and implementation (Phase 3) will consist of several general steps.

- ▼ *Select priority areas.* In collaboration with appropriate stakeholder groups, ITME initially will select priority areas for change. Teams will be created for each area with relevant stakeholder representation.

- ▼ *Identify current status of each selected priority area.* For each area, information will be collected on the current "state of the art." A comprehensive review will be conducted about how the area currently is being addressed across the educational continuum.

- ▼ *Identify options for change.* With collaborators, identify options for change. In some cases, changes may be introduced without additional data gathering. In those cases, develop and implement plans, and work with collaborators to introduce the changes.

- ▼ *Identify "best practices."* When additional data are needed to decide among options for change, work with collaborators to identify any best practices and evaluate the basis for their success. Determine if best practices are generally applicable.

- ▼ *Create appropriate tools to support the recommended changes.* Work with collaborators to design and pilot test new educational materials and evaluation instruments that are needed to bring about desired changes.

- ▼ *Implement model programs and evaluate the results.* Identify sites where model programs can be introduced. Collaborative teams from the site and ITME will work to implement the programs. Each change will have a robust evaluation included as part of the methodology, so that the reasons for success or failure of the change can be determined.

- ▼ *Develop recommendations for national implementation.* Determine the system-level changes that are needed to support national implementation of the change (for

example, changes in accreditation standards, in licensing examination/certifying examination content). Work with appropriate entities to bring about these changes.

It is anticipated that the results of Phase 3 will be available during 2010.

The following are examples of the types of areas that ITME may address, in collaboration with appropriate partner organizations. For each area, there already is national-level activity by major stakeholder organizations that would facilitate the planning and implementation of change. It is anticipated that these types of activities and collaborations will grow during Phase 3.

- ▼ *Ensuring that the learning environment is conducive to the development of appropriate attitudes and values, as well as skills, in physicians-in-training.* Medical students and resident physicians learn both from formal course work and from their role models (teachers, supervisors and mentors). Often called the "hidden curriculum," the informal lessons learned by physicians-in-training have a powerful influence on their attitudes, values and behaviors. Both the Liaison Committee on Medical Education and the Accreditation Council for Graduate Medical Education currently are addressing how the learning environment should be designed to support the development of desired professional attributes in physicians. ITME believes that reform in the learning environment is key to bringing about change in the outcomes of medical education. *This addresses Recommendation 7.*

- ▼ *Teaching and evaluating learning in new content areas.* Although the medical curriculum has, at many institutions, become more integrated and interdisciplinary, it has been difficult to incorporate new content areas not based in the traditional basic and clinical sciences. Areas such as patient safety/quality improvement; ethics and professionalism; health disparities, health literacy and cultural competence; and health systems/health economics often are relegated to the status of "add-ons" that do not fit seamlessly into the curriculum. Even if taught as longitudinal curriculum "threads," such

content areas are not comprehensively evaluated, so the growth in learners' knowledge and skills cannot be determined. The current review by the National Board of Medical Examiners and the Federation of State Medical Boards of the structure of the United States Medical Licensing Examination sequence is fortuitous, in that the results could support inclusion of these content areas at appropriate points in training. The Veterans Administration also is funding additional residency positions in programs that agree to introduce educational innovations, including teaching in some of these new content areas. *This addresses Recommendations 3, 4, 5 and 6.*

▼ *Supporting the development and utilization of the skills of lifelong learning.* While many medical schools include developing the skills of lifelong learning among their objectives, there is little attention to how the physician acquires and utilizes these skills throughout his/her professional life. Yet this area is receiving attention from those who evaluate physicians. In the eyes of many, including medical specialty boards, continuing medi-

cal education now should be more closely linked to the needs of the physician's practice and should result in improved patient outcomes. New formats of continuing medical education—just-in-time, Internet-based and performance assessment—are especially relevant, as they explicitly link learning to practice. The use and outcomes of these new formats of continuing medical education have yet to be evaluated. It will be especially important to determine their relationship with patient outcomes. *This addresses Recommendations 3 and 8.*

▼ *Physician re-entry and retraining.* The increasing length of physician training is an issue that cannot be addressed in the short term. However, it is important to determine how to meet the needs of physicians who leave practice for a period of time or who desire to change their practice focus midcareer. ITME will work with the American Academy of Pediatrics and other medical specialty societies, as well as with state medical licensing boards, in this area. *This addresses Recommendations 2 and 9.*

Conclusion

The conclusion of Phase 3 of ITME is timed to coincide with the 100th anniversary of the "Flexner Report." In 1910, *Medical Education in the United States and Canada*,[10] by Abraham Flexner, articulated a model for medical education that reflected advances in the sciences relevant to medical practice. Physicians educated in the "Flexnerian" paradigm could directly apply their knowledge and skills to the care of patients in the home and the hospital. In the 21st century, the needs of the health care system should again serve as the catalyst for medical education transformation. In the past century, new content areas have been identified as relevant to the practice of medicine. In addition, physicians must understand the structure, financing and delivery of health care, which have become orders of magnitude more complex.

In response to the increasing knowledge and skills required of physicians, medical education expanded to add specialty training (graduate medical education) and continuing medical education. Each of these has developed in virtual independence from undergraduate medical education (medical school). The problems associated with compart-mentalization of physician training should be a stimulus for rethinking the model of medical education predominant during the 20th century.

There are signs, however, that herald the potential for a functional medical education continuum. One positive indication is the introduction and broad acceptance of the six Accreditation Council for Graduate Medical Education/American Board of Medical Specialties competencies. ITME aims to support this positive direction. The end product of medical education should be a physician who is prepared to function in and provide direction for the changing health care system. Medical education should be configured to allow the acquisition and application of knowledge, skills, attitudes and values in a logical sequence, from the requirements for entry to medical school through the ongoing education of the physician in practice. Such a pathway requires communication and coordination among the phases of the continuum. The competent physician is the end to be achieved. Each phase of the continuum must explicitly contribute in a systematic way to achieve this desired endpoint.

References

1. Institute of Medicine. *To Err Is Human: Building a Safer Health System.* Washington, DC: National Academies Press; 2000.

2. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century.* Washington, DC: National Academies Press; 2001.

3. Institute of Medicine. *Health Professions Education: A Bridge to Quality.* Washington, DC: National Academies Press; 2003.

4. Institute of Medicine. *Academic Health Centers: Leading Change in the 21st Century.* Washington, DC: National Academies Press; 2003.

5. The Blue Ridge Academic Health Group. *Reforming Medical Education: Urgent Priority for the Academic Health Center in the New Century.* Atlanta, GA: The Robert W. Woodruff Health Sciences Center; 2003. Report 7.

6. Ad Hoc Committee of Deans. *Educating Doctors to Provide High Quality Medical Care: A Vision for Medical Education in the United States.* Washington, DC: Association of American Medical Colleges; 2004.

7. Lesky LG. The ever-widening training-practice gap [commentary]. *Acad Med.* 2007;82(3):219–221.

8. Mueller PS, Barrier PA, Call TG, et al. Views of new internal medicine faculty of their preparedness and competence in physician-patient communication. *BMC Med Educ.* 2006;6:30. Published Online: May 26, 2006. doi:10.1186/1472-6920-6-30.

9. McCord G, Smucker W, Selius BA, et al. Answering questions at the point of care: do residents practice EBM or manage information sources? *Acad Med.* 2007;82(3): 298–303.

10. Flexner A. *Medical Education in the United States and Canada.* New York, NY: A Report to the Carnegie Foundation for the Advancement of Teaching; 1910. Bulletin No. 4. Reprinted by Science and Health Publications, Washington, DC.

Appendix

ITME second working conference participants
September 2006

Participants' information current as of September 2006

M. Dewayne Andrews, MD
Executive dean
University of Oklahoma College of Medicine
P.O. Box 26901
Oklahoma City, OK 73190
dewayne-andrews@ouhsc.edu

Peter B. Angood, MD, FCCM
Vice president and chief safety officer
Joint Commission
1 Renaissance Blvd.
Oakbrook Terrace, IL 60181
pangood@jointcommission.org

Carol A. Aschenbrener, MD
Senior vice president, medical education
Association of American Medical Colleges
2450 N. St. N.W.
Washington, DC 20037
caschenbrener@aamc.org

David E.J. Bazzo, MD
Associate director
University of California–San Diego PACE program
1899 McKee St., Suite 126
San Diego, CA 92110
dbazzo@ucsd.edu

Bruce J. Bellande, PhD
Executive director
Alliance for Continuing Medical Education
1025 Montgomery Highway
Birmingham, AL 35216
bbellande@acme-assn.org

Guila Bonamino, PhD
Associate dean, medical education
University of Kansas School of Medicine
3901 Rainbow Blvd.
Kansas City, KS 66160-7300
gbonamin@kumc.edu

Helen Burstin, MD, MPH
Director, Center for Primary Care, Prevention
and Clinical Partnerships
Agency for Healthcare Research and Quality
540 Gaither Road
Rockville, MD 20850
helen.burstin@ahrq.hhs.gov

Peter W. Carmel, MD*
Chair, Department of Neurosurgery
University of Medicine and Dentistry of New Jersey–
New Jersey Medical School
90 Bergen St., Suite 8100
Newark, NJ 07103-2425
peter.carmel@ama-assn.org

Baretta R. Casey, MD
Vice chair, Department of Family Practice and
Community Medicine
University of Kentucky College of Medicine
171 Cedar Hills Drive
Pikeville, KY 41501
bcase2@email.uky.edu

Kelly Caverzagie, MD*
Fellow, general internal medicine
University of Pennsylvania School of Medicine
32 Prospect St.
Bryn Mawr, PA 19010
kcaverzagie@mac.com

Carlyle Chan, MD
Department of Psychiatry and Behavioral Medicine
Medical College of Wisconsin
8701 Watertown Plank Road
Milwaukee, WI 53226
cchan@mcw.edu

Harry Gallis, MD
Director, Charlotte Area Health Education Center
P.O. Box 32861
Charlotte, NC 28232-2861
harry.gallis@carolinashealthcare.org

Benjamin Galper
Medical student
Albert Einstein College of Medicine
1925 Eastchester Road, Apt. 7A
Bronx, NY 10461
bgalper@aecom.yu.edu

Carl J. Getto, MD
Senior vice president, medical affairs
University of Wisconsin Hospital and Clinics
600 Highland Ave., Room H4/821
Madison, WI 53792-8310
cj.getto@hosp.wisc.edu

Stuart Gilman, MD
Director, special fellowships
U.S. Department of Veterans Affairs
Long Beach VA Medical Center (11/111)
5901 E. Seventh St.
Long Beach, CA 90822
stuart.gilman@va.gov

Peter S. Greene, MD
Executive director
MedBiquitous Corporation
The World Trade Center Baltimore
401 E. Pratt St., Suite 1700
Baltimore, MD 21202
pgreene@medbiq.org

Larry D. Gruppen, PhD
Director, educational resources and research
University of Michigan Medical School
1500 E. Medical Center Drive, G1113 Towsley
Ann Arbor, MI 48109-0201
lgruppen@umich.edu

Anne Gunderson, GNP, CRRN-A
Research assistant professor
Department of Medical Education
University of Illinois College of Medicine
808 S. Wood St.
Chicago, IL 60612
agunderson@uic.edu

Paul Helgerson, MD
Associate program director, internal medicine
Department of Internal Medicine
Stanford University School of Medicine
19 Williams Lane
Foster City, CA 94404
paul.helgerson@med.va.gov

Cherri D. Hobgood, MD
Associate dean, curriculum and educational development
University of North Carolina at Chapel Hill
School of Medicine
322 MacNider Building
Chapel Hill, NC 27599-7530
hobgood@med.unc.edu

Wm. James Howard, MD, MACP
Vice president, academic affairs
Washington Hospital Center, Room 6A-126
110 Irving St. N.W.
Washington, DC 20010
wm.james.howard@medstar.net

Marcia J. Jackson, PhD
Senior adviser, education
American College of Cardiology
9111 Old Georgetown Road
Bethesda, MD 20814-1690
mjackson@acc.org

Fred M. Jacobs, MD, JD
Commissioner, Department of Health and
Senior Services of New Jersey
7 Laurel Court
Short Hills, NJ 07078
fred.jacobs@doh.state.nj.us

Ann C. Jobe, MD, MSN*
Executive director
Clinical Skills Evaluation Collaboration
c/o Educational Commission for Foreign
Medical Graduates
3624 Market St., Second Floor West
Philadelphia, PA 19104
ajobe@ecfmg.org

Richard A. Justman, MD
National medical director, United Healthcare
Mail Route MNO12S117
5901 Lincoln Ave.
Edina, MN 55436
richard_a_justman@uhc.com

Norman Kahn, MD
Vice president, science and education
American Academy of Family Physicians
11400 Tomahawk Creek Parkway
Leawood, KS 66211
nkahn@aafp.org

Jerry M. Kaiser
Founder, Caring Matters
455 Huckleberry Lane
Boulder Creek, CA 95006
jkaiser@caringmatters.com

Michael G. Katz*
Medical student
University of Rochester School of Medicine and Dentistry
60 Crittenden Blvd., Apt. 1001
Rochester, NY 14620
michael_katz@urmc.rochester.edu

Darrell G. Kirch, MD
President
Association of American Medical Colleges
2450 N. St. N.W.
Washington, DC 20037
dkirch@aamc.org

Lynne M. Kirk, MD, FACP
Associate dean, graduate medical education
Southwestern Medical School
5323 Harry Hines Blvd.
Dallas, TX 75390
lynne.kirk@utsouthwestern.edu

Denise Koo, MD, MPH, CAPT, USPHS
Director, Career Development Division
Office of Workforce and Career Development
Centers for Disease Control and Prevention
1600 Clifton Road
Atlanta, GA 30333
dkoo@cdc.gov

John Kues, PhD
Assistant dean, continuing medical education
University of Cincinnati College of Medicine
P.O. Box 670556
Cincinnati, OH 45267-0556
kuesjr@uc.edu

David C. Leach, MD
Executive director, Accreditation Council for
Graduate Medical Education
515 N. State St.
Chicago, IL 60610
dcl@acgme.org

John Mahoney, MD
Assistant dean, medical education
University of Pittsburgh School of Medicine
M211 Scaife Hall, 3550 Terrace St.
Pittsburgh, PA 15261
mahoney@medschool.pitt.edu

Jacqueline Mayhew
Director, CPE
American Heart Association
7272 Greenville Ave.
Dallas, TX 75231-4596
jackie.mayhew@heart.org

Walter J. McDonald, MD
Executive vice president
Council of Medical Specialty Societies
23610 N.E. Kaskillan Drive
Battle Ground, WA 98604
wmcdonald@cmss.org

Allan M. McLeod, DO, JD, MBA
Director of undergraduate clinical education
Philadelphia College of Osteopathic Medicine
4170 City Ave.
Philadelphia, PA 19131
allanm@pcom.edu

George Mejicano, MD
Assistant dean, continuing medical education
University of Wisconsin Medical School
750 Highland Ave., Room 4263
Madison, WI 53705-2221
mejicano@wisc.du

Donald E. Melnick, MD
President
National Board of Medical Examiners
3750 Market St.
Philadelphia, PA 19104
dmelnick@nbme.org

Bonnie Miller, MD
Associate dean, undergraduate medical education
Vanderbilt University School of Medicine
203 Light Hall
Nashville, TN 37232-0685
bonnie.miller@vanderbilt.edu

Douglas Che Miller, MD
3104 S.W. 130th St.
Oklahoma City, OK 73170
douglas-miller@ouhsc.edu

Donald E. Moore Jr., PhD
Director, Division of Continuing Medical Education
Vanderbilt University School of Medicine
320 Light Hall
Nashville, TN 37232
don.moore@vanderbilt.edu

Thomas, J. Nasca, MD
Dean, Jefferson Medical College of Thomas
Jefferson University
12 Alyssa Circle
Malvern, PA 19355
thomas.nasca@jefferson.edu

Susan Nedza, MD, MBA
Chief medical officer, Region V
Centers for Medicare and Medicaid Services
233 N. Michigan Ave., Suite 600
Chicago, IL 60601-5519
susan.nedza@cms.hhs.gov

Karen J. Nichols, DO, MA, FACOI
Dean, Chicago College of Osteopathic Medicine
555 31st St.
Downers Grove, IL 60515
knicho@midwestern.edu

Nancy H. Nielsen, MD, PhD*
Senior associate dean
State University of New York–University at Buffalo
School of Medicine and Biomedical Sciences
Office of Medical Education
3435 Main St., 40BEB
Buffalo, NY 14214
nancy.nielsen@ama-assn.org

Bridget O'Brien, PhD
Research scholar, the Carnegie Foundation
for the Advancement of Teaching
51 Vista Lane
Stanford, CA 94305
obrien@carnegiefoundation.org

John Owings, MD
Assistant dean, student affairs
Dean's Office
University of California, Davis
School of Medicine
4150 V St., Suite 1100
Sacramento, CA 95817
john.owings@ucdmc.ucdavis.edu

Richard J.D. Pan, MD, MPH
Associate residency director
Department of Pediatrics
University of California, Davis
2516 Stockton Blvd., Room 335
Sacramento, CA 95817
richard.pan@ucdmc.ucdavis.edu

Louis N. Pangaro, MD
Professor and vice chair
Department of Medicine
Uniformed Services University of the Health Sciences
4301 Jones Bridge Road
Bethesda, MD 20814-4799
loupang@aol.com

Hoangmai Pham, MD, MPH
Senior health researcher
Center for Studying Health System Change
600 Maryland Ave. S.W., Suite 550
Washington, DC 20024
mpham@hscchange.org

David W. Price, MD, FAAFP
Director of education
Colorado Kaiser Permanente Medical Group
375 Birch St.
Broomfield, CO 80020
david.price@kp.org

Jeremiah L. Putnam, PhD
Department of Biology/Preyer Building
Davidson College
P.O. Box 7135
Davidson, NC 28035
jeputnam@davidson.edu

Mark Quirk, EdD
Professor, family medicine and community development
Director, Community Faculty Development Center
University of Massachusetts Medical School
55 Lake Ave. North
Worcester, MA 01655
mark.quirk@umassmed.edu

Kate Regnier, MA, MBA
Deputy chief executive
Accreditation Council for Continuing Medical Education
515 N. State St.
Chicago, IL 60610
kregnier@accme.org

Marie-Claude Rigaud, MD
AMA International Medical Graduates Section
880 Amli Court, #825
Aurora, IL 60502
saintjean@aol.com

Elena Rios, MD, MSPH
President and chief executive officer
National Hispanic Medical Association
1411 K St. N.W., Suite 1100
Washington, DC 20005
nhma@nhmamd.org

Mark Schaffer, EdM
Vice president, CME compliance
Thomson Professional Post Grad Services
150 Meadowlands Parkway, Fourth Floor
Secaucus, NJ 07094
mark.schaffer@thomson.com

Maureen Doyle-Scharff
Director, health education
Ross Products Division–Abbott Laboratories
625 Cleveland Ave.
Columbus, OH 43215-1724
maureen.doyle-scharff@abbott.com

Jason Schneider, MD
Division of General Medicine
Department of Medicine
Emory University School of Medicine
Faculty Office Building
49 Jesse Hill Jr. Drive, S.E.
Atlanta, GA 30303-3049
jsschne@emory.edu

Peter V. Scoles, MD
Senior vice president, assessment programs
National Board of Medical Examiners
3750 Market St.
Philadelphia, PA 19104
pscoles@nbme.org

Stephen C. Shannon, DO, MPH
President and chief executive officer
American Association of Colleges of Osteopathic Medicine
5550 Friendship Blvd., Suite 310
Chevy Chase, MD 20815-7231
sshannon@aacom.org

Susan J. Shaw, PhD
Assistant professor, Department of Anthropology
University of Arizona
Tucson, AZ 85721-0030
shaws@email.arizona.edu

David Shearn, MD
Director, physician education and development
The Permanente Medical Group
1800 Harrison St., 21st Floor
Oakland, CA 94612
david.shearn@kp.prg

Kenneth B. Simons, MD
Senior associate dean, academic affairs
Medical College of Wisconsin
8701 Watertown Plank Road
P.O. Box 26509
Milwaukee, WI 53226-0509
ksimons@mail.mcw.edu

Carl A. Sirio, MD*
Critical care medicine
University of Pittsburgh School of Medicine
3550 Terrace St., 612 C Scaife Hall
Pittsburgh, PA 15261
sirioca@ccm.upmc.edu

Susan Spaulding
P.O. Box 222
Montpelier, VT 05601
smsvt@aol.com

Marilyn K. Speedie, PhD
Professor and dean
University of Minnesota College of Pharmacy
5-130 Weaver-Densford Hall
308 Harvard St. S.E.
Minneapolis, MN 55455
speed001@umn.edu

Mark E. Splaine, MD
Section of general internal medicine
Dartmouth-Hitchcock Medical Center
1 Medical Center Drive
Lebanon, NH 03756
mark.e.splaine@hitchcock.org

R. Scott Stayner, PhD
Medical student, University of Minnesota Medical School
3524 15th Ave. South
Minneapolis, MN 55407
stay0015@umn.edu

Melinda Steele, MEd
Director, continuing medical education
Texas Tech University Health Science Center
3601 Fourth St., Stop 7113
Lubbock, TX 79430
melinda.steele@ttuhsc.edu

Carl D. Stevens, MD, MPH
Clinical associate professor, medicine
Division of Educational Development Research
UCLA School of Medicine
1000 W. Carson St., Box 21
Torrance, CA 90509
carlstevens@mednet.ucla.edu

David P. Stevens, MD
Vice president, Institute for Improving Clinical Care
Association of American Medical Colleges
2450 N. St. N.W.
Washington, DC 20037
dstevens@aamc.org

John A. Strosnider, DO
President, American Osteopathic Association
142 E. Ontario St.
Chicago, IL 60611-2864
strosnid@pc.edu

James E. Swartwout
Associate executive director
American Osteopathic Association
142 E. Ontario St.
Chicago, IL 60611-2864
jswartwout@osteopathic.org

David E. Swee, MD
Acting senior associate dean, education
UMDNJ–Robert Wood Johnson Medical School
675 Hoes Lane, Room R-102
Piscataway, NJ 08854
swee@umdnj.edu

Melissa K. Thomas, MD, PhD*
Laboratory of molecular endocrinology
Massachusetts General Hospital
340 Thier, 50 Blossom St.
Boston, MA 02114
mthomas1@partners.org

James N. Thompson, MD
President and CEO
Federation of State Medical Boards
P.O. Box 619850
Dallas, TX 75261-9850
jthompson@fsmb.org

Richard Vari, PhD
Associate dean, medical education
University of North Dakota School of
Medicine and Health Sciences
501 N. Columbia Road, Stop 9037
Grand Forks, ND 58202-9037
rdvari@medicine.nodak.edu

Dennis Wentz, MD
Principal, WentzMiller & Associates
392 Holden Road, Box 4300
Beaver Creek, CO 81620-4300
dkwentz@aol.com

Alik Widge
Medical student, University of Pittsburgh
School of Medicine
5600 Munhall Road, #603
Pittsburgh, PA 15217
widge.alik@medstudent.pitt.edu

Daniel Wolpaw, MD
Chair, curriculum council
Case Western Reserve University School of Medicine
10900 Euclid Ave., E406
Cleveland, OH 44106
drw4@case.edu

Walter W. Wolyniec III
Director, medical education
Boehringer Ingelheim Pharmaceuticals
900 Ridgebury Road, H1 177
Ridgefield, CT 06877
wwolynie@rdg.boehringer-ingelheim.com

Scott Wright, MD
Arnold P. Gold Foundation Associate Professor
of Medicine
Department of Medicine
Johns Hopkins University School of Medicine
4940 Eastern Ave., B-235
Baltimore, MD 21224
swright@jhmi.edu

Suzanne M. Ziemnik, MEd
Senior vice president, education and assessment
American Society for Clinical Pathology
33 W. Monroe St., Suite 1600
Chicago, IL 60603-5617
suzanne.ziemnik@ascp.org

*Indicates a member of the ITME leadership group

Staff from the American Medical Association

Modena H. Wilson, MD, MPH
Senior vice president, professional standards

Barbara Schneidman, MD, MPH
Vice president, medical education

Barbara Barzansky, PhD
Secretary, Council on Medical Education

Alejandro Aparicio, MD
Director, continuing physician professional development

Gail Cates, MPA
Assistant secretary, Council on Medical Education

Shirley Kellie, MD, MSC
Senior research associate, medical education

Nadia Kushch
Staff assistant, medical education

Paul H. Rockey, MD, MPH
Director, undergraduate/graduate medical education

Evelyn Sherrill-Ruffin
Staff assistant, Council on Medical Education

Arecia Washington
Staff assistant, medical education