Academic Medicine Last Pages: An Infographic Collection
Compiled for the AAMC Group on Institutional Advancement
Academic Medicine’s “Last Page” features are clear, concise, and arresting infographics that explain issues pertinent to the field of academic medicine. Covering a wide variety of topics important to medical education, clinical care, and health policy, Academic Medicine Last Pages explain everything from physician workforce shortages and the federal budget to biomedical research and international medical education. Taking advanced subjects and issues and explaining them in plain English, these infographics serve as thorough refreshers for the experienced and lucid primers for those new to academic medicine.

The following collection of Last Pages, arranged by topic, has been compiled as a resource for members of the AAMC Group on Institutional Advancement and their colleagues and staff. This collection will be updated with new Last Pages as they are produced, ensuring a steady influx of fresh, up-to-date information and analysis. We hope that this resource will be an informative resource for all readers.
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CHAPTER 1: Competencies

Mapping the ACGME Competencies to the RIME Framework

What Entrustable Professional Activities Add to a Competency-Based Curriculum
AM Last Page: Mapping the ACGME Competencies to the RIME Framework

Rechell G. Rodriguez, MD, assistant professor of medicine, and Louis N. Pangaro, MD, professor of medicine, Uniformed Services University of the Health Sciences.

- Frameworks help educators guide learning and assessment by allowing them to set level-appropriate expectations for learners progressing through increasingly higher levels of training.
- The RIME (Reporter, Interpreter, Manager, Educator) framework provides a portable vocabulary for medical educators to calibrate the progression of trainees. The vocabulary synthesizes or parses elements of the Accreditation Council for Graduate Medical Education (ACGME) competencies, including the knowledge, skills, and attitudes that medical trainees must master, into one of four increasingly responsible roles that an educator or evaluator can observe.
- The RIME framework provides a progression that allows medical educators both to set minimal expectations for trainee advancement and to provide specific feedback to trainees.
- The RIME framework is especially useful in guiding clinical medical education since the ACGME competencies lack an explicitly developmental dimension, and RIME can provide an overarching structure for milestones.
- The RIME framework facilitates faculty development and improves teachers’ evaluation of the Patient Care competency.

Matrix Integrating ACGME Internal Medicine Subcompetencies Within the RIME Framework Across the Clinical Medical Education Continuum

<table>
<thead>
<tr>
<th>The RIME framework and the ACGME internal medicine subcompetencies (by competency number)</th>
<th>Pre-clerkship</th>
<th>Clerkship</th>
<th>Post-clerkship</th>
<th>Post-graduate year 1</th>
<th>Post-graduate years 2-4</th>
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<tr>
<td>4.1 Communicate with patient and family</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
</tr>
<tr>
<td>4.1 Collect data from patient or family</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.7 Use information technology</td>
<td>I/R</td>
<td>P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1 Establish and maintain effective physician-patient relationships</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
</tr>
<tr>
<td>4.2 Use effective communication skills</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
</tr>
<tr>
<td>5.1 Demonstrate respect, compassion, and altruism</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
</tr>
<tr>
<td>5.5 Show sensitivity to patients’ culture, age, gender, disability</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Apply both an investigatory and analytic approach</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Know and apply appropriate science</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>2.2 Use patient-centered information (e.g., data from the electronic health record and from the literature)</td>
<td></td>
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<tr>
<td>6.1 Show awareness of system and provider interactions</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3 Develop appropriate diagnostic/therapeutic plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4 Manage patients effectively</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
</tr>
<tr>
<td>1.7 Demonstrate technical skills</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
</tr>
<tr>
<td>1.2 Work with patients to prevent and maintain their health</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
</tr>
<tr>
<td>4.4 Work with other health care providers</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
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<tr>
<td>4.3 Work effectively as a team leader or member</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
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<tr>
<td>5.2 Provide ethically appropriate care</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td>P*</td>
<td></td>
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<tr>
<td>6.3 Provide cost-effective care</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.4 Advocate for patients</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td></td>
<td></td>
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<td>3.8 Counsel and educate patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3.8.1 Apply practice-based improvement system</td>
<td>I</td>
<td>R</td>
<td>R</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>3.6.1 Use information about own patient population</td>
<td>I</td>
<td>R</td>
<td>R</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>3.6.2 Appraise clinical studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.8.3 Engage in teaching role</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td></td>
<td></td>
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<tr>
<td>6.1 Demonstrate awareness of different health care models</td>
<td>I</td>
<td>R</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6 Actively improve system quality</td>
<td>I</td>
<td>R</td>
<td>P</td>
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References:

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Contact:
Rechell Rodriguez, MD, Assistant Professor of Medicine, Uniformed Services University of the Health Sciences.
AM Last Page: What Entrustable Professional Activities Add to a Competency-Based Curriculum

Olle ten Cate, PhD, professor and director, Center for Research and Development of Education, University Medical Center Utrecht

Definition and rationale. Entrustable professional activities (EPAs) are tasks or responsibilities that faculty entrust to a trainee to execute, unsupervised, once he or she has obtained adequate competence. EPAs are executable within a given time frame; observable and measurable; and suitable for focused entrustment decisions. EPAs are units of work (e.g., anesthetic care of an uncomplicated patient), while competencies describe people’s abilities (e.g., knowledge, professional attitude, communication skill). Units of work and abilities of persons can be viewed as two dimensions of a grid. Competencies remain theoretical if not grounded in practice.

Multiple competencies are at stake with most activities. The dots show the most relevant competency-domains for each example EPA. EPAs link competencies to work. EPAs can serve as the primary focus of competency-based training: Supervisors can observe trainees executing an EPA, but through a lens of competencies.

A curriculum with EPAs. A manageable number of EPAs for all trainees in a full postgraduate program is 20 to 30. Each EPA includes more detailed activities (see EPA design). EPAs can serve as building blocks for portfolios. Time-in-training to attain level 4 (unsupervised practice) can be adapted upon monitoring of the trainee, marking the shift to a competency-based approach. A central part of the transition is the entrustment decision: What is the trainee prepared to do? What stage of training is the trainee ready for?
CHAPTER 2: Diversity and Inclusion

Increasing Workforce Diversity

Practice Characteristics of Racial and Ethnic Minority Graduates of U.S. MD-Degree-Granting Medical Schools
AM Last Page: Increasing Workforce Diversity

Diversity and Inclusion

The AAMC recommended a 30% increase in medical school enrollment as part of a broad strategy to address a projected shortfall of 124,000 full-time equivalent (FTE) physicians in 2025.1

Much of the anticipated shortage can be attributed to rising demand from growth of an increasingly diverse population.1

Of the total projected US population growth for 2006–2025, 45% will be among Hispanics, 18% among Blacks, 14% among Asians, and 17% among non-Hispanic Whites.2

Relative to the U.S. population, Hispanics, Blacks/African Americans, and Native Americans are underrepresented in the physician workforce.3

Enrollment rates for Hispanics, Blacks/African Americans, and Native Americans at MD-degree-granting institutions show minimal increases.4

| Percentage of U.S. Population and Physician Workforce, by Race/Ethnicity, 2007|\%
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</thead>
<tbody>
<tr>
<td>Race/ethnicity</td>
<td>% of population</td>
<td>% of physicians</td>
<td></td>
<td></td>
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<tr>
<td>Hispanic</td>
<td>15.0</td>
<td>5.2</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>White</td>
<td>65.8</td>
<td>70.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>12.1</td>
<td>4.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>4.5</td>
<td>11.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native American</td>
<td>0.8</td>
<td>0.3</td>
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<td></td>
<td></td>
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<tr>
<td>Other</td>
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<td>0.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two or more races</td>
<td>1.6</td>
<td>1.2</td>
<td></td>
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</table>

Racial and ethnic diversity in the physician workforce contributes to increased access to care for the underserved and to increased patient satisfaction.5,6

The Liaison Committee for Medical Education requires all medical schools to “develop programs or partnerships aimed at broadening diversity among qualified applicants for medical school admission.”7

Since 1988, the Robert Wood Johnson Foundation has supported national pipeline programs to increase diversity in medicine (the Minority Medical Education Program [MMEP] and the Summer Medical Education Program [SMEDP]). Dentistry was added in 2005 resulting in the current program, SMEDP.

Pipeline programs like SMEDP contribute significantly to meeting the nation’s need for physicians by supporting the development of a diverse and well-prepared applicant pool.9

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<th>SMEDP Program Activities</th>
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<td>Academic enrichment: basic sciences, math</td>
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<td>Career development: clinical shadowing, admissions preparation</td>
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<td>Personal development: study and learning skills, financial planning</td>
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Applicants to MD-Granting Institutions, by Race/Ethnicity and SMEDP Participation, 2004, 2005

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<thead>
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<th>Race/ethnicity</th>
<th>% of all applicants</th>
<th>% of SMEDP participants</th>
<th>SMEDP as % of all applicants</th>
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<tr>
<td>Hispanic</td>
<td>7.1</td>
<td>23.8</td>
<td>8.2</td>
</tr>
<tr>
<td>White</td>
<td>59.4</td>
<td>1.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Black</td>
<td>8.4</td>
<td>59.7</td>
<td>17.6</td>
</tr>
<tr>
<td>Asian</td>
<td>20.2</td>
<td>8.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Native American</td>
<td>0.3</td>
<td>1.2</td>
<td>9.8</td>
</tr>
<tr>
<td>Other</td>
<td>1.5</td>
<td>0.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Two or more races</td>
<td>3.1</td>
<td>4.4</td>
<td>3.6</td>
</tr>
</tbody>
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10. Association of American Medical Colleges. Summer Medical and Dental Education Program participants, July 2007. (Program was called SMEDP in 2004, prior to edition of directories in 2005.)
AM Last Page: Practice Characteristics of Racial and Ethnic Minority Graduates of U.S. MD-Degree-Granting Medical Schools

Kenneth Zhang, PhD, Senior Research Analyst; Ann Steinke, PhD, Director, Council of Deans, and Laura Castillo-Rago, PhD, Director of Research, Association of American Medical Colleges (AAMC)

As the nation's medical schools continue to expand enrollment to meet the growing healthcare needs of our nation, understanding the practice characteristics of racial and ethnic minority physicians will help inform diversity-building efforts within the physician workforce. Moreover, a number of reports provide evidence of the need for diversity in the physician workforce to serve the growing multicultural and diverse population in the United States.

- By 2007, an overwhelming majority of racial and ethnic minority physicians (86.7%) were engaged in patient care.
- 68.4% of patient-care physicians were in office-based practice.
- Less than 2% of racial and ethnic minority physicians reported conducting research or teaching.

U.S. Minority Physicians in Primary Care and Non-Primary-Care Specialties, 2007

- More than 81% of Black and American Indian/Alaska Native physicians practiced in 10 specialties.
- About 77% of Hispanic/Latino physicians and 74% of Asian physicians practiced in 10 specialties.
- Internal medicine and/or family/general practice were listed as top specialties for these four racial and ethnic groups.

Top 40 Practicing Specialties of Asian Physicians, 2007

Top 40 Practicing Specialties of Hispanic/Latino Physicians, 2007

Top 40 Practicing Specialties of Black Physicians, 2007

- By 2007, more than half of all Black, American Indian/Alaska Native, and Hispanic/Latino physicians practiced in primary care specialties, i.e., family medicine, general practice, internal medicine, obstetrics-gynecology, and pediatrics.


Data source: AAMC Minority Physician Database. 1995—1978 data were compiled from the AAMC's medical school profiles; 1979—2007 data were from the AAMC Data Warehouse Student File; all data were then matched to the AMA Physician Masterfile.
CHAPTER 3: Faculty Affairs

U.S. Medical School Faculty
AM Last Page: US Medical School Faculty

Hershel Alexander, PhD, Director of Medical School and Faculty Studies, Jonathan Lang, Senior Database Specialist, and Diane Magrane, MD, Director of Faculty Development and Leadership, AAMC, Washington, DC

Distribution of Full-Time Medical School Faculty by Rank and Gender
AAMC Faculty Roster December 31, 2007 Snapshot

Women in Medical School Leadership Positions
AAMC Women in Academic Medicine Survey, AAMC Faculty Roster December 31, 2007 Snapshot

Average Cohort Size, Retention Rate, and Attrition Rate for 17 Ten-Year Cohorts of Full-Time Medical School Faculty,* Academic Years 1981 through 1997

<table>
<thead>
<tr>
<th>Study Group</th>
<th>Cohort Size</th>
<th>Percent of Faculty Remaining at Their Medical Schools</th>
<th>Percent of Faculty Switching Medical Schools</th>
<th>Percent of Faculty Leaving Academic Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Faculty ( Faculty Overall)</td>
<td>73,752</td>
<td>4,279</td>
<td>52</td>
<td>10</td>
</tr>
<tr>
<td>M.D. or Equivalent, Clinical Departments</td>
<td>43,151</td>
<td>2,606</td>
<td>51</td>
<td>11</td>
</tr>
<tr>
<td>Ph.D. or Equivalent, Clinical Departments</td>
<td>9,378</td>
<td>587</td>
<td>51</td>
<td>9</td>
</tr>
<tr>
<td>M.D.-Ph.D. or Equivalent, Clinical Departments</td>
<td>3,462</td>
<td>220</td>
<td>53</td>
<td>15</td>
</tr>
<tr>
<td>M.D. or Equivalent, Basic Science Departments</td>
<td>2,113</td>
<td>84</td>
<td>52</td>
<td>9</td>
</tr>
<tr>
<td>Ph.D. or Equivalent, Basic Science Departments</td>
<td>3,669</td>
<td>389</td>
<td>60</td>
<td>8</td>
</tr>
<tr>
<td>M.D.-Ph.D. or Equivalent, Basic Science Departments</td>
<td>928</td>
<td>42</td>
<td>54</td>
<td>12</td>
</tr>
<tr>
<td>Men</td>
<td>57,349</td>
<td>2,993</td>
<td>53</td>
<td>10</td>
</tr>
<tr>
<td>Women</td>
<td>16,347</td>
<td>1,293</td>
<td>48</td>
<td>9</td>
</tr>
<tr>
<td>White (Not Hispanic/Latino)</td>
<td>60,524</td>
<td>3,348</td>
<td>53</td>
<td>10</td>
</tr>
<tr>
<td>Other Race/Ethnicity</td>
<td>10,938</td>
<td>771</td>
<td>50</td>
<td>10</td>
</tr>
</tbody>
</table>

*Every full-time faculty member in each of the 17 academic years from 1981 to 1997 was tracked 10 years in the AAMC Faculty Roster to determine retention and attrition percentages.

The table has been reprinted with permission from the AAMC Analysis in Brief, “The Long-Term Retention and Attrition of U.S. Medical School Faculty” (Volume 8, Number 4, June 2008).

Percent of Full-Time Faculty Who Are White, 1966–2007 AAMC Faculty Roster December 31 Snapshots

From 1966 to 2007, white faculty declined from 93 percent to 75 percent of all faculty. Among full professors and associate professors, the corresponding decline was from 95 percent to 83 percent; among all other faculty, the corresponding decline was from 90 percent to 67 percent.
CHAPTER 4: Health Care Delivery

Integrating Quality—A National Movement
Past, Present, and Future

Patient-Centered Medical Home

Healthcare Innovation Zones

How Does the American Board of Medical Specialties Advance Quality Health Care in the United States?

Accountable Care Organizations

Hospice and Palliative Medicine (HPM)

Health Insurance Expansion Impact on Patients, States, and Providers
AM Last Page: Integrating Quality—A National Movement, Past, Present, and Future

David Davis, MD, senior director, Continuing Education and Performance Improvement, David Longnecker, MD, director, Health Care Affairs, Meaghan Quinn, MHSA, Program Associate, Association of American Medical Colleges (AAMC)

The Institute of Medicine report “To Err is Human” stimulated providers and policy makers to focus on improved quality and safety in health care, both in the United States and abroad.¹

Past: Other Key Drivers of Integrating Quality into Health Care

- Health care reform: Health information technology, comparative effectiveness
- Quality: Accountability, transparency, public reporting, team-based care
- Regulation: Accreditation (Joint Commission, Accreditation Council for Graduate Medical Education, Accreditation Council for Continuing Medical Education), American Board of Medical Specialties certification and maintenance of certification
- Information explosion: Scientific discovery, new diseases, new cures, global medicine, public health
- National reports on quality and medical education: National Patient Safety Foundation, Institute of Medicine, Macy Foundation

Present: The AAMC’s Integrating Quality Initiative

- Identify sources of practice variations in academic centers
- Intervene to reduce variations
- Disseminate results for broader impact
- Convene national integrating quality meetings that showcase best practices
- Encourage team training
- Foster careers in quality improvement and safety
- Encourage networking via Websites, listservs, newsletter
- Build integrated quality curricula across missions
- Provide quality teaching resources via MultiEPORTAL

This is a broad-based effort to achieve the cultural transformation that will be required of academic medicine to lead the move to a safer, higher quality learning health system

Present: The TEAMS Model

The integrating quality TEAMS Model depicts the key organizational components needed to achieve a strategic, integrated approach to quality across the academic missions of clinical care, education, and research.

From the Present to the Future: What Else Should Academic Health Centers Be Doing?

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>UME: Undergraduate medical education</td>
<td>Didactic lectures, early attention to problem-based learning</td>
<td>Fully integrated clinical/quality experiences, full incorporation of competencies into curriculum and assessment</td>
</tr>
<tr>
<td>GME: Graduate medical education</td>
<td>Early attention to problem-based learning, systems-based practice competencies</td>
<td>Interdisciplinary, team-based, developed from objective (quality) measures</td>
</tr>
<tr>
<td>CME: Continuing medical education</td>
<td>Didactic, peer-mentored, based on self-assessed needs</td>
<td>Integrated, quality-based on common accreditation principles</td>
</tr>
<tr>
<td>The continuum</td>
<td>Separately, isolated segments</td>
<td>Integrated, seamless, based on common accreditation principles</td>
</tr>
</tbody>
</table>

References:
The Patient-Centered Medical Home (PCMH) is a new primary care practice model that may play a central role in improving primary health care and in reforming the health care delivery system. How might medical homes achieve this? What are the essential components of the medical home?

A brief time line of the medical home concept:

- The medical home term was first introduced by American Academy of Pediatrics (AAP). It referred to improving health care for children with special needs.
- The U.S. Institute of Medicine (IOM) reported that the essential characteristics of primary care should include accessibility, comprehensiveness, coordination, continuity, and accountability.
- The IOM revised its definition of primary care to include the important role of patients, families, and communities, as well as integrated services.
- The American Academy of Family Physicians (AAFP), AAP, American College of Physicians (ACP) and the American Osteopathic Association (AOA) released the Joint Principles of the Patient-Centered Medical Home.
- The Annals of Family Medicine published the final report of The Future of Family Medicine project wherein they stated that every American should have a personal medical home.
- Patient Protection and Affordable Care Act, which includes provisions for the medical home, passed.

The medical home aims to address the following problems:
- High and rising health care costs
- A fragmented health care system wherein primary care has lost its central role
- Consumers who are dissatisfied with their physician-patient relationships
- Poorly coordinated care and lack of comprehensive care, especially for patients with chronic conditions
- Limited access to physicians, especially after hours, via telephone, and through e-mail.

Key features of a PCMH as described in the Joint Principles:
- A personal physician—for each patient and/or family, who guides a team to achieve comprehensive, coordinated, and continuous patient care
- Whole-person orientation—through which the PCMH team coordinates aspects of a patient’s care across every stage of life
- Coordinated and/or integrated care—across the entire health care system, including specialty care as well as hospital- and community-based services. This coordination should be facilitated by appropriate health information technologies
- A commitment to quality and safety—supported by evidence-based medicine and clinical decision-support tools
- Enhanced access to care achieved through open scheduling, after-hours access, and improved communication between patients and providers

The Ideal Medical Neighborhood

The PCMH must be situated as part of a larger and integrated delivery system whereby the neighborhood functions as a single accountable entity jointly responsible for the care of its patients. In this model the medical home serves as the hub of care coordination and accepts responsibility for helping patients navigate all aspects of their care. The composition of specific medical neighborhoods will be subject to local practice norms, care infrastructure, and community needs.

Disclaimer
This paper reflects work conducted before Dr. Pham joined the Centers for Medicare & Medicaid Services (CMS) and does not represent CMS policies or programs.

References
2. Institute of Medicine, Division of Health Manpower and Resources Development. A Manpower Policy for Primary Care: Report of a Study. Washington DC: National Academy of Sciences, 1978
3. Donabedian AS. Institute of Medicine, Division of Health Care Services, Committee on the Future of Primary Care. Primary Care: America’s Health in a New Era. Washington DC: National Academy Press, 1996
A Healthcare Innovation Zone (HIZ) is a "community" designed to increase health care provider integration and align incentives. Components of an HIZ include but are not limited to teaching hospitals, community health providers, home health care, and patient-centered medical homes. In an HIZ, all of these providers are committed to training the next generation of physicians, nurses, and other health professionals in a new care delivery environment that incorporates innovation and inquiry, which in turn leads to outcomes-driven, cost-effective health care.

The primary goal of an HIZ is to lower costs and improve quality by integrating and aligning the three missions of research, clinical care, and education:

**Advancing effectiveness research, HIZs will:**
- Develop and use implementation science research teams to build the evidence base through applied research (data-mining, mathematical modeling, observational analysis) and through rapid dissemination and adoption of best practices
- Design, implement, and test the new clinical processes and technologies that will emerge under payment reform

**Redesigning care delivery in AHCs, HIZs will:**
- Introduce and test new methods for improving integration between the specialties and primary care
- Define the role of specialties in the health of populations
- Pilot new payment models
- Contribute to the fund of knowledge on population health and the care of individuals

**Reengineering medical education, HIZs will:**
- Develop and implement changes in the education continuum to ensure all providers entering practice are prepared to deliver safe, competent, and coordinated, team-based, patient-centered care

### HIZ: Implementation Agenda

1. **Research agenda:** Patient-centered outcomes and comparative effectiveness research; Population research; Informatics
2. **Patient engagement:** Communications; Connectivity; Education
3. **Access:** Distributed network; Multispecialty sites; Primary care network
4. **Payment reform:** Value-based purchasing; Episodes of care; Bundled payments; Readmissions
5. **Care delivery innovations:** Quality and safety performance; Patient-centered medical homes; Care coordination across continuum
6. **Health information technology:** Electronic health records implementation and health information exchange; Privacy and security of health information
7. **Healthcare Innovation Zone:** AHC and community alliance
8. **Education agenda:** Training medical professionals for the future through workforce development and training, interprofessional training, and graduate medical education financing

### The Challenges:
- Integrating the HIZ’s many moving parts
- Gaining experience with new models
- Aggressively pursuing operational efficiencies
- Implementing and expanding electronic health records to all strategic partners and using information technology to improve coordination of care
- Creating a culture of positive change

### The Process:
Language regarding the HIZ concept was included in the Patient Protection and Affordable Care Act of 2010. The AAMC is now collaborating with leaders of the Center for Medicare and Medicaid Innovation to develop an HIZ demonstration program.

AHCs have a unique infrastructure that can integrate innovations in clinical care delivery models and payment reforms into a research mission that can be harnessed to rapidly evaluate innovations and ensure dissemination of successful ones. Medical schools and teaching hospitals contain the building blocks and leadership to improve health and health care for the nation.

AHC indicates academic health center.
More than 75 years ago, a group of physicians formed the American Board of Medical Specialties (ABMS) to meet the public’s need to evaluate the competency of its physicians.

Today, ABMS and its 24 member boards certify physicians in more than 150 medical specialties and subspecialties.

In the United States, more than 750,000 physicians are certified by one or more of the ABMS member boards.

The 24 member boards of ABMS are the American Boards of: Allergy and Immunology, Anesthesiology, Colon and Rectal Surgery, Dermatology, Emergency Medicine, Family Medicine, Internal Medicine, Medical Genetics, Neurological Surgery, Nuclear Medicine, Obstetrics and Gynecology, Ophthalmology, Orthopaedic Surgery, Otolaryngology, Pathology, Pediatrics, Physical Medicine and Rehabilitation, Plastic Surgery, Preventive Medicine, Psychiatry and Neurology, Radiology, Surgery, Thoracic Surgery, and Urology.

Defining and examining essential physician competencies of quality patient care
To enhance the value of board certification to physicians and, more broadly, to the public, ABMS and its member boards agreed in 2000 to require a dynamic process of physician learning and self-assessment.

The result is the ABMS Maintenance of Certification (ABMS MOC) program, now under way for diplomates of all 24 member boards. All member board MOC programs require measurement of six core competencies.

Requiring physicians to demonstrate their commitment to lifelong learning and competency in a specialty and/or subspecialty, through a four-part process of the ABMS MOC program:

**Part I—Licensure and Professional Standing**
Medical specialists must hold a valid, unrestricted medical license in at least one state or jurisdiction in the United States, its territories, or Canada.

**Part II—Lifelong Learning and Self-Assessment**
Physicians participate in educational and self-assessment programs that meet specialty-specific standards set by their member boards.

**Part III—Cognitive Expertise**
Physicians demonstrate, through formalized examination, that they have the fundamental, practice-related, and practice-environment-related knowledge to provide quality care in their specialty.

**Part IV—Practice Performance Assessment**
Physicians are evaluated in their clinical practice according to specialty-specific standards for patient care. They demonstrate that they can assess the quality of care they provide compared with peers and national benchmarks and then apply the best evidence or consensus recommendations to improve that care using follow-up assessments.

Providing quality information to patients and providers
In the fall of 2011, board certified physicians’ participation status in an ABMS MOC program will become available on the ABMS Web site. This gives patients, providers, insurers, credentialing bodies, and others the information they need to assess a physician’s commitment to lifelong learning and self-assessment.

For more information, visit www.CertificationMatters.org.
AM Last Page: Accountable Care Organizations (ACOs)

T. Samuel Shonemaker, MD, JD, Jean and Thomas McMullin Dean of Medicine and vice president for clinical affairs, Texas A&M Health Science Center College of Medicine

Why Do We Need ACOs?
The current health care system is unsustainable with:

- Exceptionally high costs, yet marginal quality;
- Highly fragmented care leading to waste and duplication;
- Failure to use evidence-based medicine (EBM), creating variations in practice that increase costs but do not improve care; and
- Uneven use of health information technology (HIT), such that essential patient information is often not available to caregivers, creating patient safety and efficiency issues.

What Is an ACO?

ACOs can be configured in many different ways, featuring different combinations of providers. ACOs often incorporate specialty doctors and tertiary care hospitals as needed to ensure that patients get the full spectrum of care.

What is the MSSP?
The MSSP...

- Requires adoption of EBM to improve care delivery and reduce costs.
- Requires use of HIT to coordinate care and report extensive quality/outcomes data.
- Aims to provide information to caregivers at the point-of-care so as to influence decision making at the physician–patient level.
- Supports the innovation of placing cost-control decisions in the hands of care providers (where they belong) rather than in the hands of payers.

What Are Some of the Challenges Academic Health Centers (AHCs) Will Face in Creating ACOs?

- The traditional AHC educational model is expensive and inefficient, increasing costs.
- The lack of primary care and ambulatory infrastructure, coupled with a culture that values subspecialty and inpatient care, makes structuring an academic ACO difficult.

References:
AM Last Page: Hospice and Palliative Medicine (HPM)

C. Porter Storey, MD, executive vice president, American Academy of Hospice and Palliative Medicine

- HPM is one of the fastest-growing, but least understood specialties.
- Palliative medicine is often misunderstood by patients and even other physicians who view it as only end-of-life care, or the specialty for patients who have given up hope.
- Palliative medicine encompasses more than end-of-life care; it covers the care and support of patients and families at all stages of a serious illness, and it can be provided together with disease-directed treatments.
- Hospice is a specific type of palliative care provided in the last months of life.
- Research studies, such as recent publications in the New England Journal of Medicine and Journal of Palliative Medicine, show that patients who receive palliative care are more satisfied than those who do not, have fewer intensive care stays, and may even live longer.

Education and Training
- Fellowship training is now mandatory for board certification in the field of HPM. A physician may enter a 12-month fellowship training if board certified or board eligible in any one of 10 cosponsoring American Board of Medical Specialties (ABMS) member boards or four American Osteopathic Association Bureau of Osteopathic Specialists (AOABOS) boards.
- Fellows trained in palliative medicine develop particular expertise in the following:
  - Complex symptom management
  - Psychosocial and spiritual support for patients with a serious illness and their families
  - Assistance with advance care planning, goals of care, and decision-making
  - Continuity of care across settings (e.g., hospital, home, clinic, hospice, nursing home)
  - Home and hospice care
  - Bereavement care
  - Interdisciplinary teamwork

Specialization and Practice
- HPM is one of the newer board-certified sub-specialties: ABMS member boards and AOABOS boards both began certification in 2007.
- The Joint Commission recently began offering advanced certification in palliative care to hospitals that provide exceptional inpatient palliative care services.

- Traditionally, many physicians enter HPM mid-career.
- HPM physicians work in all population areas – urban (41%), suburban (21%), rural (16%), and mixed (23%).
- The majority of HPM physicians indicate they are employed full-time (71%); however, many hospice medical director positions are part-time.

References
5. American Academy of Hospice and Palliative Medicine; Membership Survey. (June 2017).
6. Author contact: porterstorey@stoold(obj).

Workforce
- As the benefits of HPM are recognized more broadly and as the population ages (by 2030, 1 in 5 Americans will be over 65), the need for palliative care will increase.
- There is one palliative medicine physician for every 1,200 people with serious and advanced illness.
Health Care Delivery

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**AM Last Page: Health Insurance Expansion Impact on Patients, States, and Providers**

Jason Kleinman, MPP, Program and Policy Specialist, Association of American Medical Colleges

The primary objective of the Affordable Care Act (ACA) is to reduce the number of uninsured Americans by expanding access to affordable health insurance coverage. Effective January 1, 2014, the federal government, in accordance with the Supreme Court's 2012 ruling, may provide financial incentives for states that expand Medicaid eligibility to individuals at or below 138% of the federal poverty level (FPL), which is about $16,000 for individuals and about $27,000 for a family of three. Consumers and small businesses also may purchase health insurance through state “marketplaces” (previously called “exchanges”). Additionally, beginning January 1, 2015, large employers will be required to provide coverage to their employees or pay a penalty. The implementation of health insurance expansion will affect patients, states, and providers and have an impact on major teaching hospitals.

**Patients**

Fifty percent of nonelderly uninsured Americans have incomes below 138% of the FPL and could be eligible for Medicaid expansion.

13 million

Number of nonelderly people projected to enroll in Medicaid and the Children’s Health Insurance Program (CHIP) by 2023 because of the ACA.

24 million

Number of people projected to be enrolled in health insurance marketplaces by 2023.

31 million

Number of people projected to remain uninsured by 2023.

The coverage expansion will increase demand for health care services at the same time our nation faces a growing shortage of physicians.

<table>
<thead>
<tr>
<th>Patients</th>
<th>States</th>
<th>Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 million</td>
<td>93%</td>
<td>$18.1 billion</td>
</tr>
<tr>
<td>24 million</td>
<td>&lt; 3%</td>
<td>Decrease in Medicaid DSH (Disproportionate Share Hospital) payments under the ACA between 2014 and 2020. These payments provide support to hospitals that serve a large share of low-income and uninsured patients.</td>
</tr>
<tr>
<td>31 million</td>
<td>28%</td>
<td>Percentage of all Medicaid discharges that are from major teaching hospitals. These hospitals will continue to provide a disproportionate amount of care to the medically underserved, even as their DSH payments are cut.</td>
</tr>
</tbody>
</table>

**References:**


Contact information: jkleinman@aamc.org

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The federal government will pay 100% of states’ Medicaid expansion costs from 2014 to 2016; 95% in 2017; and 90% in 2020 and beyond.

<table>
<thead>
<tr>
<th>States</th>
<th>Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>2015-2016</td>
</tr>
<tr>
<td>2020 +</td>
<td>2017-2020</td>
</tr>
</tbody>
</table>

93% Percentage of total Medicaid expansion costs covered by the federal government between 2013 and 2022 if all states expand Medicaid.

< 3% Total increase in state Medicaid spending ($76 billion) between 2012 and 2022 if all states expand Medicaid.

25 states + Washington, DC

Number of states that have decided to expand Medicaid as of December 2013.

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The federal government will pay 100% of states’ Medicaid expansion costs from 2014 to 2016; 95% in 2017; and 90% in 2020 and beyond.

The coverage expansion will increase demand for health care services at the same time our nation faces a growing shortage of physicians.

Projecting supply and demand for physicians in the United States, the AAMC has found that the nation will be facing a shortage of almost 92,000 physicians by the year 2020. This includes both the number of physicians needed to meet the demand for care and the number of physicians needed to replace those who are retiring. The shortage will be greatest in the specialties that are projected to have the greatest demand for new doctors, such as primary care, pediatrics, and family medicine.

91,500 Projected physician shortage by 2020.

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Medicaid DSH Reduction (in billions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2014</td>
<td>0.1</td>
</tr>
<tr>
<td>FY 2015</td>
<td>0.3</td>
</tr>
<tr>
<td>FY 2016</td>
<td>0.5</td>
</tr>
<tr>
<td>FY 2017</td>
<td>0.7</td>
</tr>
<tr>
<td>FY 2018</td>
<td>1.0</td>
</tr>
<tr>
<td>FY 2019</td>
<td>1.5</td>
</tr>
<tr>
<td>FY 2020</td>
<td>2.0</td>
</tr>
</tbody>
</table>

$18.1 billion Decrease in Medicaid DSH (Disproportionate Share Hospital) payments under the ACA between 2014 and 2020. These payments provide support to hospitals that serve a large share of low-income and uninsured patients.

28% Percentage of all Medicaid discharges that are from major teaching hospitals. These hospitals will continue to provide a disproportionate amount of care to the medically underserved, even as their DSH payments are cut.
CHAPTER 5: Health Policy

Understanding Title VII

The Health Reform Law and Academic Medicine

The Health Reform Law Implementation Timeline

The Federal Budget and Academic Medicine

AAMC-Member Institutions Are Doing More With Less Under ACA
AM Last Page: Understanding Title VII*

Contributors: Tannaz Rasouli, Senior Legislative Analyst, and Dave Moore, Senior Director of Government Relations, AAMC, Washington, DC

Six Categories of Title VII Health Professions Training Programs:
- Diversity: HCOP, COE, SDS, Faculty Loan Repayment
- Primary Care Medicine and Dentistry: Predoctoral and Residency Training, Faculty Development, Physician Assistant Training, Academic Administrative Units
- Interdisciplinary, Community-based Linkages: AHEC, Allied Health, Geriatric
- Workforce Information and Analysis
- Public Health Workforce Development: Public Health, Preventive Medicine, Dental Public Health
- Student Financial Assistance: HPSL, PCL, LDS

Aims to Improve
- Diversity of the health professions workforce
- Distribution of the health professions workforce

Title VII Programs Support All Phases of the Health Professions Education and Training Continuum

K-12 Education → Undergraduate Medical/Health Professions School → Residency Training → Medical/Health Professions Faculty

The following health professions disciplines are eligible for training support through one or more of the Title VII programs: medicine, dentistry, psychology, pharmacy, nursing, public health, and allied health.

The health professions programs are authorized under Title VII of the Public Health Service Act (PHSA) and are administered by the Health Resources and Services Administration (HRSA). The PHSA provides federal authority for most HHS activities, including NIH, CDC, AHRQ, and other programs at HRSA – such as the National Health Service Corps and community health centers.

Legislative Authority (Congress)

Authorization: Public Health Service Act

Appropriation: Annual HHS Spending Bill

Administrative Authority (U.S. Department of Health and Human Services)

HHS
- AHRQ
- NIH
- CDC
- IHS
- SAMHSA
- FDA

HRSA
- Title VIII
- Title VII Health Professions

Follow the Funding
- HHS Agencies

Congress provides funding to HRSA for the programs in the annual HHS spending bill. HRSA then distributes the funding to eligible entities through a competitive application process. Students are eligible for Title VII loans, loan guarantees, and scholarships, while academic institutions and non-profit organizations receive grants and contracts.

In fiscal year (FY) 2006, Congress drastically reduced funding for the health professions programs by more than 50% (from $300 million in FY 2005 to $145 million in FY 2006). Most recently, for FY 2008, Congress provided $194 million for the Title VII programs. Despite this increase, funding levels for all Title VII programs remain below their FY 2005 levels.

*A glossary defining many acronyms related to Title VII can be found on page 110 of this issue.
**AM Last Page: The Health Reform Law and Academic Medicine**

Tannaz Rasouli, MPH, Senior Legislative Analyst, and Travis W. Crytzer, MPA, Legislative Analyst, AAMC

President Obama signed into law on March 23, 2010, the Patient Protection and Affordable Care Act1 and on March 30, 2010, the Health Care and Education Reconciliation Act of 2010,2 known collectively as the Affordable Care Act (ACA). Over the next several years, the Department of Health and Human Services (HHS) will need to implement many ACA provisions through regulations, while other provisions will require annual funding from Congress before they can take effect. Several of the provisions directly affecting academic medicine are summarized below.

### Coverage
- Covers 32 million currently uninsured individuals starting in 2014
- 16 million added to Medicaid
- 16 million covered through new state “exchanges”
- 23 million remain uninsured (including unauthorized immigrants)

### Select Provisions of the ACA

#### Medical Research
- Establishes a Patient Centered Outcomes Research Institute with dedicated funding
- Authorizes a Cures Acceleration Network with within the National Institutes of Health to facilitate the development of “high-needs cures”

#### Innovations
- Allows eligible providers to partner as accountable care organizations that bundle payments and share in any Medicare cost-savings that might occur
- Creates a Center for Medicare and Medicaid Innovation that will test new delivery models (e.g., healthcare innovation zones [HIZs]) that improve quality of care while maintaining or reducing costs

#### Physicians
- Establishes a 5-year, 10% Medicare bonus for primary care physicians and for general surgeons practicing in shortage areas
- Sets Medicaid primary care reimbursement rates at no less than 100% of Medicare rates for 2013 and 2014
- Mandates Physician Quality Reporting Initiative (PQRI) incentive payments through 2014; penalties to follow in 2015
- Establishes a new “value-based” payment modifier to reflect the quality, cost, and volume of care
- Authorizes HHS to award grants to states for the development, implementation, and evaluation of current tort litigation
- Extends federal liability protections to free clinics

#### Underlying Objectives
- How will the Affordable Care Act affect medical schools and teaching hospitals?
- Expanding Primary Care
  - Authorizes a Primary Care Extension Center program
  - Invests in community health centers
- Mitigating Health Disparities
  - Requires HHS to collect and study certain data related to disparities
  - Establishes HHS offices of minority and women’s health

#### Controlling Costs
- Directs President to appoint the Independent Payment Advisory Board (IPAB) to draft and execute new Medicare payment policies that reduce the rate of expenditure growth, with limited Congressional input

#### Workforce
- Redistributes 65% of unused GME residency slots with preference for primary care and general surgery
- Removes certain barriers to counting resident time in clinical non-hospital settings
- Preserves and redistributes Medicare-supported residency slots from hospitals that close
- Authorizes dedicated funding for National Health Service Corps
- Reauthorizes Title VII health professions and Title VIII nursing education and training programs
- Establishes an independent National Health Care Workforce Commission

### Hospitals
- $155 billion in hospital cuts over 10 years via:
  - Reductions in annual updates, payments for certain re-admissions, and payments related to certain hospital acquired conditions
  - Establishment of Medicare value based purchasing (VBP) program that pays based on performance for select quality benchmarks
  - Reductions in Medicare and Medicaid disproportionate share hospital (DSH) payments to reflect reductions in the number of uninsured Americans

### Prevention and Wellness
- Establishes dedicated funding stream for public health and prevention programs
- Establishes a council to plan a national public health strategy
- Prohibits cost-sharing for certain preventive services
- Supports employer wellness programs

### Resolved Issues
- Even with enactment of this historic law, Congress must address several key issues through other legislation:
  - The law does not increase the cap on Medicare support for residency training
  - The law does not address the Sustainable Growth Rate (SGR) physician payment methodology
  - Many programs authorized in the law will require funding from Congress via annual spending bills

### Unresolved Issues
- The ACA also includes student loan provisions that were unrelated to health reform but are significant to medical schools:
  - Decreases payments under Income-Based Repayment for new borrowers starting July 2014
  - Restructures federal Stafford loans, originating all new loans under the Direct Loan Program

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*A The law does not explicitly require the studies; they are part of a related agreement between the HHS Secretary and Representatives from “low-spending” states.

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2 Pub L. No. 111-152, 124 Stat 1029.
President Obama signed into law on March 23, 2010, the Patient Protection and Affordable Care Act\(^1\) and on March 30, 2010, the Health Care and Education Reconciliation Act of 2010,\(^2\) known collectively as the Affordable Care Act (ACA). Over the next several years, the Department of Health and Human Services (HHS) will need to implement many ACA provisions. Several ACA provisions that directly impact medical schools and teaching hospitals are shown below in a calendar year timeline.

### AM Last Page: The Health Reform Law Implementation Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law allows counting resident didactic time in hospital settings for indirect medical education (IME) payments (beginning retroactively from Jan. 1, 1983).</td>
<td>States must establish health insurance exchanges for individuals and small businesses</td>
<td>The HHS Secretary must establish a bundled payment demonstration project under Medicaid conducted in up to eight states to lower cost and improve care beginning Jan. 1.</td>
<td>Medicare and Medicaid Disproportionate Share Hospital (DSH) payment reductions totaling $36.1 billion over 10 years begin in FY 2014 to reflect reduction in number of uninsured Americans</td>
<td>All U.S. citizens and legal residents must obtain coverage or face tax penalties</td>
<td>CMS implements a new “value-based” payment modifier for Medicare physician payments to reflect the quality, cost, and volume of care.</td>
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<tr>
<td>Medicare reduces the FYs 2010 and 2011 hospital payment updates by 0.25%</td>
<td>Medicare reduces the FY 2012 hospital payment update by a productivity adjustment, less another 0.1%</td>
<td>Medicare reduces the FY 2013 hospital payment update by a productivity adjustment, less another 0.1%</td>
<td>Medicare reduces the FY 2014 hospital payment update by a productivity adjustment, less another 0.3%</td>
<td>Medicare reduces the FY 2015 hospital payment update by a productivity adjustment, less another 0.2%</td>
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</tr>
<tr>
<td>Government Accountability Office (GAO) appoints Patient Centered Outcomes Research Institute (PCORI) Board on Sept. 23 and Workforce Commission on Sept. 30</td>
<td>Centers for Medicare and Medicaid Services (CMS) makes 10% bonus payments to general surgeons in health professions shortage areas (HPSAs), as well as to primary care physicians through the end of calendar year 2015.</td>
<td>Until the end of 2014, Medicare payments for primary care services must equal at least 100% of Medicare payment levels for similar services.</td>
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<tr>
<td>Law allows counting resident didactic time in clinical non-provider settings for direct graduate medical education (DGME) payments (beginning retroactively from July 1, 2009).</td>
<td>A total of $1.5 billion over five years becomes available to the HHS Secretary to increase National Health Service Corps funding, if appropriators meet funding thresholds.</td>
<td>CMS redistributes unused residency slots by July 1, and teaching hospitals begin receiving IME/DGME support for those slots.</td>
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</tr>
<tr>
<td>Law provides $400 million in FY’s 2011 and 2012 via special payments for hospitals in counties with low Medicare spending.</td>
<td>The workforce commission’s first annual report on “high priority areas” is due April 1.</td>
<td>CMS begins FY 2013 hospital Medicare value-based purchasing (VBP) program that pays based on performance for select quality benchmarks.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Law provides mandatory funding for the PCORI through FY 2019.</td>
<td>FY 2013 hospital readmission penalties begin.</td>
<td>All state Medicaid programs must cover individuals with incomes up to 133% of the federal poverty level.</td>
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</tr>
<tr>
<td>Law bans new physician-owned hospitals and allows current physician-owned hospitals to continue to operate but imposes many requirements including that hospitals have a provider agreement in effect by Dec. 31.</td>
<td>First IPAB report submitted to Congress and the President.</td>
<td>FY 2015 Medicare penalties begin for certain hospital-acquired conditions (HACs).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMS must launch Center for Medicare and Medicaid Innovation (CMI) by Jan. 1.</td>
<td>HHS Secretary must establish a Medicare Accountable Care Organization (ACO) program that promotes accountability, coordination, quality, and efficiency through a shared savings program.</td>
<td>First IPAB report submitted to Congress and the President.</td>
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</tbody>
</table>

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AM Last Page: The Federal Budget and Academic Medicine

David B. Moore, senior director, Government Relations, Association of American Medical Colleges

The federal government's investment to support the missions of medical schools and teaching hospitals is a small but essential part of the federal budget that has undergone increasing scrutiny during the ongoing deficit reduction discussions in Washington, D.C. The following graphics describe funding through the National Institutes of Health (NIH) for medical research, funding through Medicare for both graduate medical education and the specialized services that teaching hospitals provide, and the relationship of these programs (NIH and Medicare) to the overall federal budget.

Federal Spending – 2012

- The Congressional Budget Office (CBO) estimates that in fiscal year (FY) 2012, which began on October 1, 2011, the federal government will spend $3.6 trillion.
- The federal budget has more than doubled in size since 2000.
- Social Security, Medicare, and Medicaid account for 44% of the federal budget, totaling nearly $1.6 trillion.
- Roughly 36% of the budget is discretionary spending (in green), which is determined by Congress through the annual appropriations process. In FY 2012, discretionary spending will total $1.3 trillion.
- Discretionary spending is determined annually by the House and Senate Appropriations Committees, which are each divided into 12 subcommittees with jurisdiction over specific federal departments and agencies.

Nondefense Discretionary Spending – 2012

- Discretionary spending is often further divided between defense and nondefense spending, which includes funding for programs ranging from the Department of Agriculture and the Department of Education to the National Science Foundation and National Aeronautics and Space Administration. For this reason, nondefense discretionary spending is often called “domestic” spending.
- The Labor, Health and Human Services (HHS), and Education (ED) and Related Agencies Subcommittee is the largest of the domestic funding subcommittees, accounting for nearly 30% of nondefense spending.
- One out of every five dollars in the Labor-HHS bill goes to the NIH, which received $30.6 billion in FY 2012.

Mandatory Spending – 2012

- Mandatory spending is funding for programs covered by federal laws other than appropriations. Mandatory spending includes entitlement programs, which by law require the federal government to make payments to individuals (or state or local governments) that meet the legal criteria for eligibility.
- Examples of mandatory spending programs other than Medicare include Social Security, Medicaid, unemployment compensation, and federal civilian and military retirement.
- One of out every four mandatory spending dollars goes to Medicare.
- The CBO estimates that support for teaching hospitals through direct and indirect medical education payments will total $9.1 billion in 2012, less than 2% of Medicare’s overall budget.

Social Security, Medicare, and Medicaid Continue to Consume More of the Federal Budget

Twenty years ago, Social Security, Medicare, and Medicaid represented less than one-third of the federal budget. Today, they account for 44% of all federal spending. Further, the CBO projects by 2022, 54 cents out of every dollar the federal government spends will go to these three programs.

In March 2012, the CBO estimated that the federal budget deficit for the fiscal year ending on September 30, 2012, would be $1.2 trillion. The CBO noted that while the deficit is starting to shrink, it remains very large by historical standards. Concerns about the federal budget deficit and the ability of the federal government to identify and support national priorities will likely be key issues during the fall election campaigns. Regardless of who wins in November, the President and Congress will face daunting challenges as they attempt to secure the sustainability of the nation’s fiscal future. The future role of the federal government in supporting critical national priorities such as medical research and graduate medical education may well be determined by the success of those efforts.

Note: All data are from the Congressional Budget Office. The Budget and Economic Outlook: Fiscal Years 2012-2022, January 31, 2012.

Author contact: dbmoore@aamc.org

25 Association of American Medical Colleges
The Affordable Care Act (ACA, PL 111-148 and PL 111-152) was enacted in 2010 to improve health care delivery, quality, and access while lowering costs. Medical schools and teaching hospitals are at the forefront of reform implementation, leading innovations in research, education, and clinical care. Yet—as the figures below demonstrate—under the ACA, these members of the Association of American Medical Colleges (AAMC) face substantial funding cuts that may undermine their significant contributions and services.

### What AAMC-Member Institutions Are Doing Under New ACA Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% of first round Patient-Centered Outcomes Research Institute awards</td>
<td>50%</td>
</tr>
<tr>
<td>44% of Health Care Innovation awards to lower costs and improve care for the people with the highest health care needs</td>
<td>44%</td>
</tr>
<tr>
<td>38% of original participants in the Pioneer Accountable Care Organization model, designed for providers to rapidly shift to population-based payment</td>
<td>38%</td>
</tr>
<tr>
<td>17% of participants in Medicare's Shared Savings Program, designed to improve quality of care and reduce costs</td>
<td>17%</td>
</tr>
</tbody>
</table>

### What AAMC-Member Institutions Are Doing Under Their Ongoing Missions of Research, Education, and Clinical Care

**Research**
- Nearly half of all extramural medical research supported by the National Institutes of Health (NIH) occurs at medical schools and teaching hospitals
- 65.5% of FY2011 NIH extramural training awards to support the preparation of the future biomedical research workforce went to AAMC medical schools and teaching hospitals
- 82% of FY 2012 grant funding from the Agency for Healthcare Research and Quality went to AAMC medical schools and teaching hospitals

**Education**
- 141 medical schools throughout the country educate 75,000 medical students pursuing an M.D.
- 74% of all medical residents are trained at AAMC’s nearly 400 member teaching hospitals and health systems

**Clinical Care**
- AAMC members provide:
  - 38% of charity care
  - 80% of level 1 trauma centers
  - 74% of comprehensive stroke centers
  - 70% of burn care units
  - 59% of pediatrics ICUs

### What AAMC-Member Institutions Are Doing That is Not Funded Under the ACA

AAMC members account for only 6% of all hospitals, but they provide a disproportionate amount of care to critically ill and/or underserved patients. Under the ACA, they will face critical cuts that over time will jeopardize access to care.

Cuts include the following:
- $36 billion over 10 years in combined Medicare/Medicaid Disproportionate Share Hospital (DSH) payments, which offset costs of providing charity care
- $44 million in FY 2014 due to readmissions penalties that do not account for the higher proportion of low-income/dual-eligible Medicare patients treated at teaching hospitals
- $2.83 billion through FY 2021 under the Hospital Value-Based Purchasing program

Further:
- Medicaid expansion is optional; employer mandate is delayed a year, resulting in fewer people than expected gaining access to affordable health insurance
- Increased pressures on clinical revenues jeopardize the research mission at medical schools and teaching hospitals
- The ACA did not address Medicare’s Sustainable Growth Rate (SGR), which is scheduled to reduce physician reimbursement by 24.4% in 2014 if not addressed by Congress
- The ACA did not address the cap on residency positions, which will contribute to a shortage of 91,500 physicians by 2020

**Data sources:**
Association of American Medical Colleges

**Author contact:** jkleinman@aamc.org
CHAPTER 6: Historical Interest

Selected Seminal 20th-Century Medical Education Reports after Flexner

Sir William Osler’s Major Contributions to Medical Education

Alton Ochsner, MD
AM Last Page: Selected Seminal 20th-Century Medical Education Reports after Flexner

Marian Taliaferro, MSLS, Manager, Reference Center and Archives and Elizabeth S. Karlin, MA, Staff Editor, Academic Medicine, Association of American Medical Colleges

1932: Rappleye Report
- Composed by the independent Commission on Medical Education in response to increasing specialization in medicine
- Advocated medical schools as the best entities for deciding the medical school curriculum
- Called for learning objectives regarding clinical education
- Promoted emphasizing general medical concepts, treating the patient as a whole, and preventing—not just treating—illness
- Highlighted an oversupply of U.S. physicians, but also highlighted their unequal dispersion
- Called for greater access to health care for all Americans
- Advocated quality medical care and hospitals’ participation in the medical education process

1984: GPEP Report
- Authored by 19 deans and faculty, including university presidents and others who were non-physician educators
- Responded to the perceived need to better align the work of academic medical centers with developments such as specialization, an aging U.S. population, and new health care delivery patterns
- Stated clearly that the purpose of undergraduate medical education is not sufficient in itself to prepare doctors for practice
- Called for the general professional education of the medical student, including more active, self-directed learning and a focus on learning analytical skills and professional values—rather than memorizing facts
- Advocated broader premedical learning incorporating the humanities and social sciences; teaching students techniques to better prepare them for CME; restructuring clinical education to be more patient-focused; and creating more faculty resources for working closely with students

1998: MSOP Report
- Developed from concerns that U.S. physicians were not adequately meeting society’s expectations and from the results of the report Assessing Change in Medical Education: The Road to Implementation (The 1992 ACME-TRI Report), which revealed that schools were not following the recommendations of the GPEP Report
- Identified qualities students should demonstrate at graduation; they should be altruistic, knowledgeable, skillful, and dutiful

1988: Clinical Education and the Doctor of Tomorrow
- Grew out of concerns over a decrease in medical school applicants, falling satisfaction among medical trainees regarding their education, diminished regard for medicine, and a projected surplus of specialists and shortage of generalists
- Focused on clinical education, specifically (1) the optimal outcomes of medical education, including physicians’ roles in society; (2) the nature of teaching and learning; and (3) ideal teaching methods and venues
- Resulted in these recommendations: (1) central—not departmental—control of clinical undergraduate medical curricula and medical school control of graduate medical education; (2) report of pass/fail and above/below standards—instead of numeric grades—for, respectively, National Board exams and the MCAT; (3) more training in ambulatory settings, especially for generalists; (4) a community service requirement for trainees; and (5) performance-based examinations of residents’ clinical skills
- Led to central—not departmental—control of clinical undergraduate medical curricula

1. Rappleye WC (Director). Medical Education: Final Report of the Commission on Medical Education. New York: Association of American Medical Colleges
5. Educating Medical Students: Assessing Change in Medical Education—The Road to Implementation. Washington, D.C.: AAMC.
AM Last Page: Sir William Osler’s Major Contributions to Medical Education

Paul S. Mueller, MD, Mayo Clinic, Rochester, Minnesota

The Clinical Clerkship

Osler wrote, "In what may be called the natural method of teaching, the student begins with the patient, continues with the patient, and ends his studies with the patient, using books and lectures as tools, as means to an end."1

- Osler was widely recognized as a master bedside teacher. He examined patients thoroughly, cheerfully, and respectfully—while imparting his immense knowledge to learners.
- At Johns Hopkins, Osler introduced the clinical clerkship, incorporating medical students into hospitals’ medical staffs—a practice previously unavailable in the United States.2
- Osler was one of the founders of the modern residency system of postgraduate medical education.

Higher Standards for Admission to and Graduation from Medical School

- During Osler’s time, many medical schools had minimal admission and graduation requirements. Osler advocated higher admission standards, robust pre-clinical training, and early exposure to the clinics and wards where students took histories, performed physical examinations, and examined laboratory specimens.
- In his 1910 report, Abraham Flexner describes the education program at Johns Hopkins—so influenced by Osler—as “the ideal for medical education.”3
- However, Osler opposed Flexner’s recommendation that full-time, salaried, laboratory-based physicians teach students fearing that such a system would produce clinicians who could not see beyond the laboratory; Osler believed clinicians should teach.4

The Principles and Practice of Medicine5

- 500,000 copies printed
- Influenced medical students and practitioners for more than 50 years
- Includes classical and historical references
- Most recent (at that time) information on internal medicine, complemented by Osler’s firsthand knowledge of pathology
- Contained limited therapeutic information and admittedly little about the treatment of disease

Lifelong Learning

Osler stated, “If the license to practice meant the completion of his education, how sad it would be for the practitioner, how distressing to his patients! More clearly than any other, the physician should illustrate the truth of Plato’s saying that education is a life-long process.”6

Osler advised students and physicians in practice (whom he addressed as “fellow students”) of the importance of continuing their educational development throughout their careers. He believed that professional memberships prevented “staleness of the mind” and advised life-long continuing education.7

Role Model of Professionalism

In his clinical work, teaching, and scholarship, Osler exemplified professionalism. “He was...famous for teaching rounds. His style of teaching was inspiring and motivating, always including cheerful greetings for patients and always adding insightful criticisms for students—but never in a mean-spirited fashion.”8

AM Last Page: Alton Ochsner, MD
Kathleen McFadden, Publishing Supervisor, Managing Editor, The Ochsner Journal

1896—Born in Kimball, SD to Edward Philip and Clara Leda Shontz Ochsner

1914—Enters University of South Dakota at Vermillion

1918—Matriculates into the Washington University School of Medicine in St. Louis, joining the third-year class

1920—Graduates with an MD degree and begins training in internal medicine at Barnes Hospital under internist Dr. George Dock, followed by a 16-month surgical residency under his uncle Dr. A. J. Ochsner

1926—Leaves a lucrative clinical practice in Chicago to become assistant professor of surgery at the University of Wisconsin Medical School

1927—Accepts the position of chairman of surgery at Tulane University School of Medicine in New Orleans

1934—Opens the first Ochsner Clinic in New Orleans

1954—Opens the 250-bed, 5-story Ochsner Foundation Hospital

1956—Retires from surgery at age 70 as required by clinic rules and performs 7 operations on his last day as a clinic surgeon

1967—Receives the Distinguished Service Award of the American Medical Association for exceptional contributions to medicine

1981—Dies at age 85

References
Author contact: kmcfadden@ochsner.org

Antismoking Crusader
In 1939, Dr. Alton Ochsner became one of the first physicians to link smoking with lung cancer. In a report published in Surgery, Gynecology, and Obstetrics, he and colleague Dr. Michael DeBakey reported that “inhaled smoke, constantly repeated over a long period of time, undoubtedly is a source of chronic irritation to the bronchial mucosa.” Despite skepticism and, at times, ridicule from the professional medical community, Ochsner became a tireless antismoking crusader, publishing four books on the subject. One of Ochsner’s first questions when he entered the examining room to see a patient was, “Do you smoke?”

“Every type of smoking carries a deadly risk. Tobacco is a loaded weapon. Time pulls the trigger,” he said. Four years after Ochsner’s death, Merrell Dow Pharmaceuticals created the Alton Ochsner Award, presented annually to individuals and organizations for their efforts to help people stop smoking.

Pioneering Surgeon
In 1936, Dr. Ochsner became the first surgeon in the Deep South to perform a pneumonectomy as a means of dealing with a malignant bronchial lesion—the tenth pneumonectomy recorded in the world literature. In 1944, he performed the first recorded successful resection of a saccular aneurysm of the aortic arch, and in 1953, he led the surgical team that successfully separated conjoined twins, the first such successful operation in the United States.

Health Care Delivery Visionary
Along with four other founders, Ochsner established the Ochsner Clinic in New Orleans in 1942, bringing a new system of health care delivery to the region. This first group medical practice in the Deep South gave patients the opportunity to see several specialists in one setting and stood in contrast to the independent practices that were the norm at the time.

Rigorous Educator and Prolific Researcher
Ochsner served as chairman of the Department of Surgery at Tulane University School of Medicine, and he emphasized learning from current medical journals over textbooks in an effort to ensure that medical students learned the most up-to-date practices. His infamous bull pen, meant to teach aspiring doctors to think under stress, became the stuff of nightmares. Ochsner became one of the first physicians to link smoking with lung cancer.

Ochsner performed an estimated 20,000 operations over the course of his career.

The original Ochsner Clinic served as the norm at the time.

In 1942, bringing a new system of health care delivery to the region. This first group medical practice in the Deep South gave patients the opportunity to see several specialists in one setting and stood in contrast to the independent practices that were the norm at the time.

Rigorous Educator and Prolific Researcher
Ochsner served as chairman of the Department of Surgery at Tulane University School of Medicine, and he emphasized learning from current medical journals over textbooks in an effort to ensure that medical students learned the most up-to-date practices. His infamous bull pen, meant to teach aspiring doctors to think under stress, became the stuff of nightmares and legends. In these “tell me why” clinics attended by both students and staff doctors, senior medical students had to present a diagnosis after a 20- to 30-minute patient examination and then defend that diagnosis in the face of Ochsner’s rapid-fire and relentless questioning. Success in the bull pen was important, but Ochsner also placed a high premium on his trainees’ interaction with their patients. “Don’t forget that you’re treating people,” Ochsner told his students. “You’re not treating disease, but people.”

Two years after its founding, the Ochsner Clinic was restructured as the Alton Ochsner Medical Foundation to support the education and the research programs that Ochsner considered vitally important. Ochsner’s strong commitment to research is reflected in his own career bibliography, which comprises 611 articles.
CHAPTER 7:
International Medical Education

Medical Education in the Netherlands

International Medical Education

China Medical Board (CMB)

Medical Education in Ghana

The World Federation for Medical Education (WFME)
AM Last Page: Medical Education in the Netherlands

Cees van der Vleuten and Albert Scherpbier
Maastricht University, Maastricht, the Netherlands

Secondary school education (6 years) + national final exam

Lottery weighted by GPA

Undergraduate medical education:
(bachelor’s 3 years, master’s 3 years);
8 universities
± 3,000 new students per year;
degrees awarded: MD, MSc

Bachelor in life sciences (3 years)

Test battery performance

Graduate medical education:
(master’s 4 years);
2 universities;
70 new students per year;
degrees awarded: MD + MSc in clinical research

Supervised work experience as residents NOT in training
(1–4 years)

Honors programs

Job interview (+ working experience preferred)

Postgraduate medical education:
(3–6 years);
27 disciplines*

PhD (3–5 years)

Independent (mostly private) practice;
mandatory CME for relicensure

All 8 medical schools are state based;
students are partly funded by the state.

Entry is a centralized national process based on
numerus fixus; in other words, a fixed number of open slots
is determined at the national level.

Universities may select part of their intake through self-organized
selection procedures.

All schools have modern teaching approaches.

National exit exams are not required;
approximately 90% of students finish medical school.

One challenge is to adapt to the
Bologna Structure (i.e., Bach-Master system).

A minority of students earn an additional
PhD degree; some finish this degree before
their entry into postgraduate medical education.

Reform is centrally governed across all 27
disciplines; it is aimed toward competency-based
training and assessment programs.

Reform is based on CanMeds outcomes.

A challenge is the major restructuring of clinical
training programs and massive ongoing
professionalization.

Another challenge is restructuring research in
graduate schools.

Dutch medical education is a very active community of practice with
great exchange between research and development (e.g., e-learning, simulation,
quality assurance programs) including a large annual conference and
approximately 60 students working toward PhD degrees in medical
education research.

* Disciplines:
- Anesthesiology
- Cardiology
- Cardiosurgery
- Clinical Genetics
- Clinical Geriatrics
- Dermatology
- Ear, Nose, & Throat
- Gastroenterology
- General Surgery
- Internal Medicine
- Medical Microbiology
- Neurology
- Neurosurgery
- Nuclear Medicine
- Obstetrics & Gynecology
- Ophthalmology
- Orthopedic Surgery
- Pediatrics
- Pathology
- Physical and Rehabilitation Medicine
- Plastic Surgery
- Psychiatry
- Pulmonology
- Radiology
- Radiotherapy
- Rheumatology
- Urology

Broken-line boxes indicate optional programs.
AM Last Page: International Medical Education

M. Brownwell Anderson, Association of American Medical Colleges (AAMC); John Naccini, Foundation for Advancement of International Medical Education and Research (FAIMER)

Distribution of Medical Schools Around the World

- As of June 2009, the International Medical Education Directory (IMED) listed 2,102 operating medical schools (including schools of osteopathic medicine) in 171 countries or territories.
- The schools listed in IMED are recognized by the appropriate government agency or agencies in their respective countries.
- Africa, with one medical school for every 6.9 million inhabitants, has the lowest density of medical schools of all the continents. At the same time, it has the highest burden of disease. Healthy life expectancy in Africa is 45 years.

International Medical Education Opportunities for Medical Students, Trainees, and Faculty

- FAIMER and the AAMC created the International Opportunities in Medical Education database to capture information about U.S. medical schools that offer programs for their students, residents, and faculty in international venues.
- The International Opportunities in Medical Education database also catalogs opportunities for international medical students, residents, and faculty to participate in U.S. programs stateside.
- 74 U.S. medical schools offer clinical education programs abroad for their students.
- 86 U.S. medical schools provide opportunities for international medical students to study in the United States.

Collaboration Through FAIMER Between U.S. and International Medical Schools

- Over 300 fellows from the 35 countries colored on the map to the right are currently participating in FAIMER.
- FAIMER funds and conducts fellowships in medical education and leadership for faculty from low-income countries in Africa, Asia, and Latin America.
- FAIMER has expanded from its original institute in Philadelphia to include regional institutes in (1) Porto das Dunas, Brazil, (2) Cape Town, South Africa, and (3) Mumbai, (4) Lusaka, and (5) Coimbatore, India.

* Regions as defined by the World Health Organization; these percentages do not include U.S. schools of osteopathic medicine, North American experiences take place in Canada and Mexico.

1. https://imeda.faimer.org
AM Last Page: China Medical Board (CMB)

M. Roy Schwarz, MD, past president of CMB

CMB is nearing its 100th anniversary as a foundation supporting education and science in Asia.

CMB Historical Landmarks

1914
The Rockefeller Foundation established CMB with the goal of creating a world-class, western science-based medical school in China.

1915
CMB established Peking Union Medical College (PUMC), fashioned after the Johns Hopkins model of medical education.

1928
CMB was incorporated as a free-standing foundation with responsibility for managing PUMC.

1937–1946
The Japanese occupied Peking, forcing PUMC to close. The hospital remained open.

1951
PUMC and its hospital were nationalized, and CMB was dismissed from the People’s Republic of China.

1980
CMB returned to China but continued to work in other parts of Asia including Mongolia, Nepal, Vietnam, Thailand, and Laos.

2010
CMB provided financial support for 22 institutions and in 6 Asian countries.

From 1950 to 2000...

... CMB’s educational foci comprised the following:

- Faculty and curricular development
- Improvement of infrastructure, including libraries
- Establishment of global standards for medical education instructional programs
- Establishment of telemedicine links to remote areas
- Introduction of new teaching and evaluation methods
- Creation of centers for research in medical and nursing education.

... CMB rewarded $151.6 million in grants to 113 institutions in 18 countries in 10 program areas including the following:

- Improving education (82.1%)
  - Medical education (68%)
  - Nursing education (3.7%)
  - Public Health Education (10.4%)
- Public Health Projects (10.4%)
- Biomedical Research Projects (2.8%)

... 46 U.S. universities, including the University of Chicago Pritzker School of Medicine (which was created using PUMC as its model), supported CMB’s efforts.

CMB in 2011

CMB, which has offices in Cambridge, Massachusetts, and Beijing, China, continues its quest to improve the health of Asian people by strengthening human resources and institutional capacities in education, research, and policy making in health and related fields.

* = CMB Program Sites, 2011.
AM Last Page: Medical Education in Ghana

Professor Harold S. Amonoo-Kuofi, MB, ChB, dean, School of Medical Sciences, University of Cape Coast, Professor Kwabena Danso, MB, ChB, dean, School of Medical Sciences, Kwame Nkrumah University of Science and Technology, Sir Dr. Edward N. Gyader, MD, dean, University for Development Studies, Professor Yao Tettey, MB, ChB, dean, University of Ghana Medical School, Frank W. Anderson, MD, MPH, Department of Obstetrics and Gynecology, University of Michigan

Currently, Ghana is a country of 24 million people with 2,026 doctors.1 Ghana’s medical education system is expanding to increase the number of physicians to achieve a ratio of 1:1000 by 20251 (the U.S. ratio, as a comparison, is 2 to 4:1,0002). 32,000 doctors will need to be trained to fulfill this goal.

Ghana’s medical education system is composed of four medical schools and three major teaching hospitals.

<table>
<thead>
<tr>
<th>Medical school (location)</th>
<th>History and characteristics</th>
<th>Clinical teaching</th>
<th>Certification and Continuing Medical Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>The University of Ghana Medical School (Accra, the capital city)</td>
<td>Opened in 1964 with 25 students in the first class Serves a large urban area</td>
<td>Korle-Bu teaching hospital is the site for all major clinical rotations</td>
<td>Traditional class: 50 Graduate Program: 43</td>
</tr>
<tr>
<td>The Kwame Nkrumah University of Science and Technology School of Medical Sciences (Kumasi, the second largest city)</td>
<td>Opened in 1975 with 21 students in the first class Uses conventional teaching and a community-oriented instructional curriculum Has traditionally served a large rural area</td>
<td>Komfo Anokye Teaching Hospital is the site for all major clinical rotations</td>
<td>Current class (2012): 227 Most recent graduating class (2011): 118</td>
</tr>
<tr>
<td>University for Development Studies School of Medicine (Tamale, a remote area with a widely dispersed, rural population)</td>
<td>Opened in 1996 to address remote health problems Uses a problem-based-learning model and a community-based-extension-service approach</td>
<td>Clinical rotations occur at the newly commissioned Tamale Teaching Hospital</td>
<td>Class of 2012: 30 Class of 2018: 77</td>
</tr>
<tr>
<td>The University of Cape Coast Medical School (on the coast, 2 hours from Accra)</td>
<td>Opened in 2008, the newest medical school in Ghana Focuses on clinical and community experiences to relate science to the care of patients</td>
<td>Clinical rotations and postgraduate training occur at Central Regional Hospital</td>
<td>50</td>
</tr>
</tbody>
</table>

Developmental needs and opportunities as Ghana’s medical education system develops and expands to peripheral and rural teaching sites:
- Increased support for basic science, clinical learning, and clinical research capacity
- Use of emerging educational technologies, including simulation
- Utilization of open educational resource materials to enhance instruction, skills training, and assessment
- Introduction of modular, integrated programs for delivering the basic science curricula
- Enhanced technology for communicating with peripheral sites instead of new physical infrastructure
- New and enhanced partnerships and engagement with international academic institutions

* The specialties available in Ghana are as follows: Anaesthesia and Intensive Care, Cardiothoracic Surgery, Dental Surgery, Emergency Medicine, Family Medicine, General Surgery, Internal Medicine, Laboratory Medicine, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopodics and Trauma Surgery, Oto-rhino-laryngology, Paediatrics and Child Health, Paediatric Surgery, Plastic and Reconstructive Surgery, Psychiatry, Public Health, Radiology, Radiotherapy and Oncology, Urology

† Unless otherwise specified

References
What is the WFME?
WFME is the global organization concerned with the education and training of doctors whose ultimate mission is to strive for better health care for all mankind. Its primary objective is to enhance the quality of medical education worldwide through the promotion of the highest scientific and ethical standards in medical education. WFME began in 1972, bringing together the World Health Organization (WHO), regional medical education associations from around the world, and other partners. WFME, the umbrella organization for six regional medical education associations, follows the regional structure of WHO and is a non-governmental organization in official relation to WHO.1

What are current and future WFME projects?
- WFME believes that medical education should have common high standards internationally and that the best practices in medical education should be disseminated globally.
- WFME launched its program to define international standards for medical education in 1997. Three international task forces with broad representation from all six WHO-WFME regions developed the current WFME Global Standards, which were published in 2003.2
- Global dissemination is a growing challenge. The number of medical schools in the world has grown remarkably in the last sixty years. Many new medical schools are excellent, but some are not.
- Reliable and valid data on the number and quality of medical schools is hard to obtain. WFME leads in developing the Avicenna Directory,3 the WHO-recognized world directory of medical schools. A new World Directory of Medical Schools, incorporating Avicenna and the International Medical Education Directory,4 is under development, pending approval by the governing bodies of WFME and the Foundation for Advancement of International Medical Education and Research.

What are current and future WFME projects?
- Because the accreditation of medical education—that is, certifying the suitability of medical education programs and the competence of medical schools to deliver quality medical education—is of the highest importance, WFME has worked with WHO both to develop Guidelines for Accreditation and to promote accreditation of medical education. WFME is also working in partnership to develop procedures to validate national accreditation processes—“Accrediting the accreditors.”1
- WFME is leading a project called “What is the Future Global Role of the Doctor?”6 We must examine what doctors will do in the future to understand what medical education should aim to do in that future.

References
CHAPTER 8: MCAT

Evolving Behaviors of MCAT Examinees Who Apply to U.S. Medical Schools

The MCAT Exam: Comparing the 1991 and 2015 Exams
AM Last Page: Evolving Behaviors of MCAT Examinees Who Apply to U.S. MD-Degree-Granting Medical Schools

David Matthew, PhD, Senior Research Analyst and Marc Kroopnick, MEng, PhD, Senior Measurement Research Analyst, Association of American Medical Colleges (AAMC)

Medical School Applicants and MCAT Examinees

- Most applicants apply to medical school using the American Medical College Application Service (AMCAS)—usually the year after they have taken the MCAT exam; for example, a student who applied in 2009 would likely have taken the MCAT exam in 2008.
- In 2007, the MCAT exam moved from a paper-based to a computer-based delivery; this change likely caused the dip in what is otherwise a steady increase in the number of annual unique MCAT examinees across this period.
- The AAMC operates both the MCAT exam and AMCAS.

MCAT Exam Test-Taking Patterns

- Since 2007, when it moved to computer delivery, the MCAT exam has been offered more than 20 times a year; previously, it was offered only twice a year.
- In the two most recent application years (2008, 2009), a small increase occurred in the proportion of applicants taking the exam two or more times relative to those taking it once.
- These current data are preliminary, but they suggest that, given the opportunity, applicants will take the MCAT exam multiple times to improve their score. Because only two years of applicant data exist since computer delivery of the exam began, additional data are needed to further support this trend.
- A worthwhile additional research effort would be to investigate the relationship across the years between performance on the first MCAT attempt and the likelihood of taking the exam a second time to determine if this relationship has changed since the introduction of computer delivery.

Reasons for MCAT Exam Score Improvement

- Medical school applicants who claimed on the Matriculating Student Questionnaire (MSQ) to have retaken the MCAT exam and improved their scores most often cited changes in their personal study habits as the cause.
- In the past two years, successful applicants increasingly credited practice exams for improved MCAT scores; this reporting mirrors the growth in sales of MCAT computer-based practice tests, which increased from 43,000 purchased in 2007 to more than 63,000 purchased in 2009.
- In 2008 and 2009, seven online versions of practice tests were available for purchase. An eighth version was also available free of charge and was accessed most often in 2009 (by more than 54,000 unique individuals).
- About 13% of MCAT retakers who responded to two MSQ questions about retaking the MCAT reported that their scores did not improve.
- No investigators have verified that applicants’ scores improved, but further study could address this question.

1. Sources: AAMC Data Warehouse and MCAT, as of 12/23/2009.
AM Last Page: The MCAT Exam: Comparing the 1991 and 2015 Exams
Marc Kroopnick, MEng, PhD, Manager, MCAT2015 Development and Psychometrics, Association of American Medical Colleges (AAMC)

In the spring of 2015, potential physicians will take the MCAT2015 exam, the newest version of the MCAT exam. The MR5 Committee (the advisory committee for the MCAT2015 exam) redesigned the exam to test the academic competencies* that tomorrow’s physicians will need to know to succeed in medical school. The design is based on survey responses from over 2,700 medical school and baccalaureate faculty members and feedback from expert panels and participants in over 90 outreach events. The MCAT2015 exam will, like the current exam (the MCAT1991 exam, introduced in 1991), test concepts in the natural sciences, as well as skills in critical analysis and reasoning. Unlike the MCAT1991 exam, the MCAT2015 exam will also cover concepts from the behavioral and social sciences. The table below highlights the features the MCAT2015 exam shares with the MCAT1991 exam, as well as its new features.

<table>
<thead>
<tr>
<th>How Are the MCAT1991 and MCAT2015 Exams the Same?</th>
<th>What’s Different on the MCAT2015 Exam?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Sciences</strong></td>
<td><strong>Behavioral and Social Sciences</strong></td>
</tr>
<tr>
<td>• Concepts from biology, general chemistry, organic chemistry, and physics that are rated as important for success in medical school are tested; in fact, approximately 75% of questions on the MCAT2015 exam test concepts that also appear on the MCAT1991 exam.</td>
<td>• Concepts from psychology and sociology (along with related biology concepts) that provide the foundation for learning about the behavioral and sociocultural determinants of health and health outcomes are tested.</td>
</tr>
<tr>
<td>• Questions require examinees to demonstrate their scientific reasoning and problem-solving skills.</td>
<td>• Questions test scientific competencies* by asking examinees to solve problems about biological and living systems and to integrate concepts from multiple disciplines.</td>
</tr>
<tr>
<td>• Two test sections focus on natural sciences concepts.</td>
<td>• Questions require examinees to use research methods and statistical skills to solve problems in the same ways that natural scientists do.</td>
</tr>
<tr>
<td><strong>Critical Analysis and Reasoning Skills</strong></td>
<td></td>
</tr>
<tr>
<td>• No specific content knowledge is needed to do well on this section.</td>
<td>• Concepts from psychology and sociology (along with related biology concepts) that provide the foundation for learning about the behavioral and sociocultural determinants of health and health outcomes are tested.</td>
</tr>
<tr>
<td>• Passages include content from the social sciences and humanities.</td>
<td>• Questions test scientific competencies* by asking examinees to integrate knowledge from different disciplines (just like in the natural sciences sections).</td>
</tr>
<tr>
<td>• Questions require examinees to demonstrate a variety of analytical and reasoning skills (i.e., cognitive-processing skills).</td>
<td>• Questions require examinees to demonstrate scientific reasoning and problem-solving skills and to use research methods and statistical skills in the same ways that social and behavioral scientists do.</td>
</tr>
<tr>
<td><strong>Writing Skills</strong></td>
<td></td>
</tr>
<tr>
<td>• Multiple-choice questions are predominantly prompted by passages and, in some cases, graphs, tables, or charts.</td>
<td>• Individual test sections include more questions than on the MCAT1991 exam; accordingly, the test day is longer by approximately two hours.</td>
</tr>
<tr>
<td>• Section scores and an aggregate total score are reported to examinees and medical schools.</td>
<td>• Reliable comparisons of section scores for different examinees are made possible by the greater number of test questions.</td>
</tr>
<tr>
<td>• A computer-based testing format that has proven effective is used.</td>
<td></td>
</tr>
</tbody>
</table>

*The natural sciences competencies tested on the MCAT2015 exam align with the competencies described by the AAMC-sponsored Scientific Foundations for Future Physicians Committee. The behavioral and social sciences competencies tested on the MCAT2015 exam build on the competencies that are described in the Institute of Medicine’s report, Improving Medical Education: Enhancing the Behavioral and Social Content of Medical School Curricula (National Academies Press, 2004; edited by Patricia A. Cuff and Neal Vanselow), and promulgated by the AAMC-sponsored Behavioral and Social Science Foundations for Future Physicians Committee.

Acknowledgments:
The author would like to thank the following AAMC personnel for reviewing earlier drafts of this Last Page: Karen Mitchell and Cynthia Searcy.

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CHAPTER 9: Medical Education

Continuing Medical Education—The 2008 Survey of U.S. and Canadian Medical Schools

Applying Knowles’ Andragogy to Resident Teaching

Robert Gagné’s Nine Events of Instruction, Revisited

A Snapshot of Three Common Program Evaluation Approaches for Medical Education

Common Evaluation Designs in Medical Education I
AM Last Page: Continuing Medical Education—The 2008 Survey of U.S. and Canadian Medical Schools*

Lois Colburn, MA, University of Nebraska; Dave Davis, MD, Association of American Medical Colleges; Michael Fords, MD, Baylor College of Medicine; Jack Kues, PhD, University of Cincinnati; Ivan Silver, MD, University of Toronto; Oswald Umuhoza, MPH, Association of American Medical Colleges

Response
- Of 120 U.S. medical schools and 17 Canadian schools, 114 schools (i.e., units) responded for a response rate of 83%.

The Products and Services of the CME Unit
On average, reporting CME units offer the following number of accredited activities:

- 170 audio, video, or online courses
- 147 courses and conferences
- 83 regularly scheduled series (rounds)
- 44 CME courses programs

Percentage of CME units providing innovative and developmental activities

The Funding Model of U.S. and Canadian CME Units
Source of CME revenue

Surpluses (or deficits) are managed as follows:
- are negotiated on an ad hoc basis or are split unequally between the sponsoring department and the CME unit
- are shared equally between the two
- become the responsibilities of the sponsoring department

Integration of the CME Unit in the External Health Care Organizations

CME Research—Research into how physicians learn and change
By the numbers:
- 34 units involved in CME research
- 20 the maximum number of grants claimed by a single unit
- 4 the maximum number of U.S. dollars in millions claimed by a single unit
- 20 the minimum number of U.S. dollars in thousands claimed by a single unit
- 18 the percentage of CME research funded by external, peer-reviewed, granting agencies
- 46 the percentage of CME research funded internally
- 36 the percentage of CME research funded by other agencies

*The Association of American Medical Colleges/Society for Academic Continuing Medical Education

Applying Knowles’ Andragogy to Resident Teaching

Elisabeth E. Bennett, PhD, director, Education Research and Development, Rebecca D. Blanchard, PhD, assistant professor, Education Research, and Kevin T. Hinchey, MD, program director, Internal Medicine Residency Program, Baystate Medical Center

Developing teaching skills in residents is a critical component of medical education because residents spend up to 20% of their time teaching junior learners. They often rely on the traditional pedagogical approaches that they observed during their years of formal schooling, but these often do not translate well with their adult learners.

One way to develop residents’ teaching skills is to frame teaching goals from the perspective of andragogy, or the “the art and science of helping adults learn.” Andragogy, popularized by Malcolm Knowles, offers principles that describe how adults learn differently than children. These principles can help residents improve their teaching, place more control of the learning process into the hands of their students, and provide insight into their own learning processes.

Adult Learning Theory

Adult learning theory is a complex phenomenon. Andragogy is one set of foundational principles, one model within a field of interconnected learning models, that address how adults acquire knowledge.

Malcolm Knowles’ Five Tenets of Andragogy

1. Readiness to learn results from real-life problems and entry into new developmental stages and changing social roles.
2. Adults have a high need to know why they need to know something, and they learn best through self-discovery with real and simulated experiences.
3. Adults have an independent self-concept, take responsibility for their lives, are increasingly self-directed, and have a deep need to control learning.
4. Adults enter into learning with a great number and variety of experiences, which provide resources for learning and relating to new material.
5. Transformative learning involves learning about the self, the other, and the world, and changing social, developmental stages, and changing social roles.

Guiding Residents to Incorporate Andragogy

The table below demonstrates some teaching goals developed in line with Knowles’ tenets of andragogy that residents can apply to junior learners and adult patients. Many of the teaching methods described below encourage self-assessment, the process of evaluating one’s knowledge and understanding, and self-reflection, the process of making meaning from learning experiences. Both concepts engage learners and motivate them to take control of their own learning, which will more quickly lead to ownership of learning and promote autonomy.

<table>
<thead>
<tr>
<th>Resident Teaching Goals by Andragogical Tenet</th>
<th>Teaching Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encourage continual knowledge development through planning, feedback, and assessment of experiential and applied learning</td>
<td>Assess the learners’ needs at the outset and their outcomes after teaching</td>
</tr>
<tr>
<td>Facilitate autonomy by increasing degrees of learner control and promoting a peer relationship</td>
<td>Develop specific goals and objectives for the learners, consistent with what they need to learn</td>
</tr>
<tr>
<td>Adapt teaching to learner needs and effectively bridge prior knowledge and new learning objectives</td>
<td>Foster a climate of learner inquiry and accept formative feedback from learners to retool teaching</td>
</tr>
<tr>
<td>Adjust teaching to individual and collective levels of life development and understand what contributes to a positive climate for change</td>
<td>Provide constructive feedback that encourages accurate self-assessment and self-reflection</td>
</tr>
<tr>
<td>Teach most relevant and immediately applicable content to solve real clinical problems</td>
<td>Evaluate evidence of learning to determine readiness for new roles</td>
</tr>
<tr>
<td></td>
<td>Be a positive role model, recognizing that people adapt in different ways</td>
</tr>
<tr>
<td></td>
<td>Provide supervision and advocacy appropriate to learner level</td>
</tr>
<tr>
<td></td>
<td>Summarize teaching into take-home points of most relevant information</td>
</tr>
<tr>
<td></td>
<td>Capitalize on “teachable moments”</td>
</tr>
</tbody>
</table>

References

1. Hatem CJ. Teaching approaches that reflect and promote professionalism. Acad Med. 2003;78:709-713.
In 1965, Robert Gagné published *The Conditions of Learning*, which identified the mental conditions for learning. These were based on the information processing model of the mental events that occur when adults are presented with various stimuli.¹

## References


AM Last Page: A Snapshot of Three Common Program Evaluation Approaches for Medical Education

Rebecca D. Blanchard, PhD, assistant professor of education research, Baystate Medical Center, Laura Torbeck, PhD, vice chair of education, Surgery, Indiana University, and Whitney Blondeau, PhD, medical education specialist, Maine Medical Center

Program evaluation, or programmatic assessment, is the application of defensible criteria to determine the worth or merit of a program, project, or curriculum. "Decision-oriented," "outcomes-oriented," and "expert-oriented" are three common approaches to program evaluation in medical education. This snapshot provides a brief review of program evaluation within each approach along the following dimensions:

**Perspective:** Do internal stakeholders or external stakeholders drive the evaluation?

**Sensitivity:** Is the evaluation examining a broad scope of the program or delving deeply into one or two particular aspects in greater detail?

**Feasibility:** Is this evaluation reasonably straightforward to complete, or does it require specialized knowledge and resources?

**Utility:** Do the evaluation results benefit local decision makers or those in a broader audience?

**Integration of theory:** Does the evaluation rely on a theory, or is it largely atheoretical?

### Decision-oriented approach

The evaluation results help program personnel make effective decisions. The type of data included in, the research design of, and the focus of the evaluation are selected to maximize the evaluators' utilization of evaluation results.

- **Perspective:** Informed by the needs of the program personnel
- **Sensitivity:** In-depth look into data at each stage of the educational process
- **Feasibility:** Can be completed with local resources but may be limited by the availability and sufficiency of the data
- **Utility:** Results largely favor local context and local decision makers, as program data are structured to reflect stages of the program (e.g., input, process, output)
- **Integration of theory:** Not directly theoretical, but the process of evaluation may draw out a theory underlying the program by identifying data points which personnel believe represent the input, process, and output of the program

### Outcomes-oriented approach

Objectives are solidified so that specific outcome measures can be established and tracked. The evaluation determines whether the program objectives have been met.

- **Perspective:** Primarily for internal feedback to explore educational processes which lead to selected outcomes
- **Sensitivity:** Evaluation results reflect the breadth of a program's process
- **Feasibility:** Evaluating the relationship between input (e.g., students' knowledge, skills, and attitudes prior to participation in the program) and output and outcomes (e.g., proximal or distal curriculum objectives or students' postparticipation knowledge, skills, and attitudes) may require specially trained educationalists
- **Utility:** Results are generally highly contextual and useful for local program and curriculum planning and development; however, results may provide broader utility by explaining educational effectiveness of programs across a spectrum of outcomes
- **Integration of theory:** Helpful for drawing out underlying assumptions and for framing the activities of the program

### Expertise-oriented approach

The evaluator relies on an external expert to determine the value of various program criteria and data points, and the program evaluation results are judged by an expert.

- **Perspective:** Externally driven process for identifying which data points (e.g., duty hours, types of surgical cases observed, or number of publications) represent quality
- **Sensitivity:** Often a broad look across the program, but results could trigger in-depth analysis of some aspects
- **Feasibility:** Generally approachable with local resources, though some elements, such as gathering and analyzing qualitative data, may require additional specialization
- **Utility:** Results generally framed to meet external requirements
- **Integration of theory:** Generally atheoretical, as data are included to demonstrate standards of performance

### References


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Evaluation design is important to establish that an instructional program produced the measured effects and learning outcomes. Evaluation design should help isolate extraneous factors so that differences or outcomes can be safely attributed to the instructional program. The goal of this Last Page is to describe three common program evaluation designs, along with benefits, drawbacks, and examples.

Internal validity of an evaluation measures the certainty with which educators can ascertain whether the program actually caused the effects they find. Educators should always consider threats to validity in designing program evaluation. Some of these internal validity threats (history, maturation, testing) are included in the description of some of the evaluation designs below.

### True Control Pre-Post Test Design

**Example:**
A group of students are randomly assigned to either the E group or the C group at the beginning of the academic year (or at the beginning of a rotation). Group E experiences a small-group discussion instructional program and Group C experiences a video-based program with facilitators. Both groups learn about the diagnosis and treatment of osteoarthritis. Both groups are tested through a MCQ, knowledge-based test before and after administration of the programs.

**Pros:**
- Randomization assures group equivalence and eliminates selection bias
- Eliminates many of the internal threats to validity, thus yielding stronger conclusions about the outcome

**Cons:**
- Randomization may be challenging in medical education settings, particularly when classes and rotations are predetermined
- If the pretest is reactive (i.e., the content of the pretest may cause students to focus their study on specific program material), it may influence the outcome of the evaluation

### Non-Equivalent Control Group Pre-Post Test Design

**Example:**
Students from hospital X (group E) and students from hospital Y (group C) are selected (not randomly) and given a multiple-choice-question (MCQ) knowledge-based pretest on asthma and chronic obstructive lung disease (COPD). Group E experiences a self-directed reading program while Group C experiences a seminar-based program, involving discussion of asthma and COPD. Both groups are tested again one month later through a MCQ knowledge-based test that has the same content, but different questions, as the pretest.

**Pros:**
- Feasible when randomization is not possible
- Allows for the comparison of two educational interventions
- The use of a pretest allows researchers to assess the comparability of the groups (e.g., are pretest scores the same or different between groups?) at the beginning of the program, since it is important to ensure that the 2 groups are similar at the beginning of the intervention

**Cons:**
- The use of a pretest can lead to testing effect; that is, students may identify certain content topics that will be on the posttest, based on test items in the pretest (e.g., the use of beta blockers in the treatment of congestive heart failure), regardless of question items being different between pre-and posttest
- Selection bias and dissimilar initial groups may be misleading and influence the outcome

### One-Group Pre-Post Test Design

**Example:**
One group of students rotating through a medicine clerkship is given an 8-station objective structured clinical examination before and after the administration of a month-long, Web-based instructional program about the clinical presentation and diagnosis of ten common medical diseases.

**Pros:**
- Easy to implement
- May be helpful for formative evaluation (e.g., to gather information that will guide program improvement), particularly if the interval of time is short

**Cons:**
- Internal validity threats, including both history (within the time that passes before and after the intervention, events may occur that influence the outcome) and maturation (learners may naturally grow during the time of the experiment), should be considered
- Absence of comparison group makes it difficult to assess whether extraneous variables affected the outcome

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**Legend**
- E = Experimental group
- C = Control group
- I = Instructional program
- T = Test, measurement, or observation
- Rand = Randomization

**References:**

**Author contact:** Dario.Torre@DrexelMed.edu
CHAPTER 10: Medical Education Research and Methods

Survey Development Guidance for Medical Education Research

Reliability and Validity in Educational Measurement

The Jefferson Longitudinal Study of Medical Education

Generalizability in Medical Education Research

How to Perform an Effective Database Search

Avoiding Five Common Pitfalls of Survey Design

Understanding Qualitative and Quantitative Research Paradigms in Academic Medicine

A Guide to Research Paradigms Relevant to Medical Education

Avoiding Four Visual-Design Pitfalls in Survey Development

Quality Criteria in Qualitative and Quantitative Research

Avoiding Five Common Pitfalls of Experimental Research in Medical Education

Funding of Academic Research in Clinical Medicine in the United Kingdom
AM Last Page: Survey Development Guidance for Medical Education Researchers

Hunter Gehiabach, PhD, assistant professor of Education, Harvard University; Anthony R. Artino, Jr, PhD, assistant professor of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences; and Steven J. Durbin, MD, professor of Medicine, Uniformed Services University of the Health Sciences.

Medical education researchers frequently rely on survey data. For example, of Academic Medicine's 141 research articles from 2009, over half (56%) used surveys. Yet, the literature provides limited guidance on which processes best facilitate the development of surveys—particularly in the design of survey scales (i.e., several items that assess a single underlying construct such as physician empathy or teaching self-efficacy; see example below). This flowchart presents seven steps to facilitate the construction of valid and reliable survey scales.

**Step 1**
Conduct a literature review both to ensure that your construct definition aligns with relevant prior research and to identify extant survey scales or items that might be used or adapted for your research context.

**Step 2**
Conduct interviews and/or focus groups to learn how your population of interest conceptualizes and describes your construct of interest.

**Step 3**
Synthesize the literature review and interview/focus group data so that the conceptualization of the construct makes theoretical sense to scholars in the field and uses language that your population of interest understands. For example, a scale assessing teaching self-efficacy (i.e., confidence in one's teaching ability) should use words like “confidence in trying out new teaching techniques,” not “efficaciousness in experimenting with novel pedagogies.”

**Step 4**
Develop items in accordance with current best practices in survey design. For example, the sample scale below uses response anchors that refer to the specific construct (rather than numbers or agree/disagree response anchors).

**Step 5**
Conduct an expert validation to assess the items’ clarity and relevance to the construct.

**Step 6**
Conduct cognitive pretesting through which participants restate each item aloud in their own words as they answer it. This step helps ensure that respondents interpret items in the manner that you intend.

**Step 7**
Pilot-test your items to check for adequate item variance, reliability, and convergent/discriminant validity with respect to other measures.

*Note: After you complete each of these final steps, you may need to revise items and/or repeat steps from this part of the process.

**Sample Items From a Teaching Self-Efficacy Scale**

1. How confident are you that you can help students remember what they learned in your class?
2. When you need to teach less interesting topics, how confident are you that you can keep all students engaged?
3. How confident are you that you can help students learn when they are unmotivated?
4. How confident are you that you can get through to the most difficult students?

<table>
<thead>
<tr>
<th>Not at all confident</th>
<th>Slightly confident</th>
<th>Moderately confident</th>
<th>Quite confident</th>
<th>Extremely confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>s-point, Likert-type response scale</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**References**

Reliability is the extent to which the scores produced by a particular measurement tool or procedure are consistent and reproducible. Reliability answers the question, “Does the assessment yield the same scores at different times, from different raters, or from different items?”

Validity is the degree to which an assessment measures what investigators want to measure, all of what they want to measure, and nothing but what they want to measure. Validity answers the question, “Does the assessment provide information that is relevant to the inferences that are being made from it?” An assessment, such as a test or questionnaire, does not have validity in any absolute sense. Instead, the scores produced are valid for some uses and not valid for others.

A target provides a metaphor for the relationship between reliability and validity. The true score (or value) for the concept the researcher is attempting to measure is at the center of the target, and the observed score the investigator gets from each person assessed is a shot at the target.

Reliability is a necessary but insufficient condition for validity. To be valid, scores must first be at least moderately reliable. However, scores that are reliable may be devoid of validity for the application the researcher has in mind.

Many methods of assessing reliability and validity are available. Each method provides the researcher with slightly different information about the reliability and validity of the assessment.

### Assessing Reliability
- **Test–retest**
  - Assesses agreement between the same assessment given on two separate occasions.
- **Equivalent forms**
  - Assesses agreement between similar forms of an assessment given at separate times.
- ** Interrater**
  - Assesses agreement between two or more coders or raters.
- **Internal consistency**
  - Splits-half
  - Kuder-Richardson
  - Cronbach alpha

### Assessing Validity
- **Construct**
  - Convergent
  - Discriminant
  - Known-groups
- **Criterion-related**
  - Predictive
  - Concurrent
  - Postdictive
- **Content-related**
  - Content
  - Face

### References
AM Last Page: The Jefferson Longitudinal Study of Medical Education

Joseph S. Gonnella, MD, founder and director, Center for Research in Medical Education and Health Care; Mohammadreza Hojat, PhD, director, Jefferson Longitudinal Study; Jon Veloski, MS, director, Medical Education Division, Center for Research in Medical Education and Health Care, Jefferson Medical College of Thomas Jefferson University

Data Available by Matriculating Class

<table>
<thead>
<tr>
<th>Year</th>
<th>Demographic and academic*</th>
<th>Clinical clerkship</th>
<th>Residency</th>
<th>Career outcomes</th>
<th>Psychosocial</th>
<th>Jefferson Scale of Empathy</th>
</tr>
</thead>
</table>

*Demographic and academic data for the classes of 1964-1969 were extracted retrospectively.

Scope of Database

Before Medical School
- Demographics
- SAT scores
- GPA science
- GPA nonscience
- MCAT scores

During Medical School
- Matriculation surveys
- Course grades
- GPA
- Course grades
- GPA
- NBE/USMLE 1
- Examination grades
- Clerkship ratings
- Hospitals of clerkships
- GPA
- NBE/USMLE 2
- Graduation survey
- Permission form

After Medical School
- Residency specialty
- Residency institution
- Geographic location
- Rating of competency
- NBE/USMLE 3
- Specialty
- Geographic location
- Board certification
- Faculty appointment
- Type of practice
- Active status
- Follow-up surveys

Reason for initiating the study: The Jefferson Longitudinal Study (JLS) at Jefferson Medical College of Thomas Jefferson University was initiated in 1970 based on the premise that medical schools have an obligation to society to monitor their educational outcomes. 1,2

History: The JLS was implemented with an intention to track every Jefferson medical student throughout his or her entire professional career. Data for the JLS are routinely updated for all entering classes from 1964 to the present using information from the Association of American Medical Colleges, American Medical Association, American Board of Medical Specialties, National Board of Medical Examiners, and in-house sources. The JLS retrieves information from the most comprehensive, extensive, and uninterrupted longitudinal database of medical students and graduates maintained in a single medical school.

Goals

Service to
- Faculty (e.g., responding to inquiries)
- Academic committees (e.g., providing data to analyze admissions trends, to evaluate programs, or to examine success/failure factors in students’ performance)
- College/departmental offices/administrators (e.g., providing data for the annual report, dean’s letters of evaluations, or accreditation)
- Students (e.g., guiding academic and career development)

Research
- Data analyses in collaboration with faculty to support their scholarship and address issues in medical education for publication and presentation at professional meetings

By the Numbers

As of December 2010, the JLS
- Contained approximately 6 million pieces of data
- Tracked 10,600 students
- Garnered data from 573 postgraduate training hospitals
- Inspired 179 peer-reviewed publications* (56 in Academic Medicine)

New Instruments

The JLS has led to the development of the following instruments for measuring educational outcomes:
- Jefferson Scale of Empathy
- Jefferson Scale of Attitudes Toward Physician–Nurse Collaboration
- Jefferson Scale of Physician Lifelong Learning
- Scale of Attitudes Toward Physician–Pharmacist Collaboration

References

AM Last Page: Generalizability in Medical Education Research

Anthony R. Artino, Jr., PhD, assistant professor of preventive medicine and biometrics, Steven J. Durning, MD, professor of medicine, Uniformed Services University of the Health Sciences, and John R. Boulet, PhD, associate vice president for research and data resources, Foundation for Advancement of International Medical Education and Research

Generalizability, also referred to as external validity, is the extent to which the conclusions of a study would hold for variations in persons, settings, treatments, and outcomes.¹

A depiction of the concept of generalizability. The conclusions of a particular study are represented by the red box. These conclusions likely generalize to persons, settings, treatments, and outcomes that are similar to those found in the study. However, as one considers other persons, settings, treatments, and outcomes that are more dissimilar to those in the study (i.e., as one moves out along the blue arrows), it is less likely that the study conclusions will generalize.²

The following restrict the generalizability of a study’s conclusions:
- A sample that is homogenous or somehow unusual
- An atypical setting
- A peculiar time in history
- An atypical treatment (e.g., an intervention applied in an abnormally small classroom)
- Inappropriate or unimportant outcomes (e.g., using only medical knowledge to assess clinical competence)

The following improve the generalizability of a study’s conclusions:
- Using random sampling
- Selecting multiple study sites (e.g., multi-institutional studies)
- Analyzing the similarities and differences between the study context and other contexts
- Replicating the study with different people, in a variety of settings, and with variations in the independent and dependent variables

When considering generalizability, researchers should ask, “To what populations, settings, treatment variables, and measurement variables can this effect be generalized?”³

The tension between generalizability and internal validity. Internal validity is the extent to which an observed association between variable A and B reflects a causal relationship from variable A to variable B.¹ Generalizability and internal validity are often in conflict within a given study (as illustrated below). That is, design features that improve internal validity, such as controlling certain independent variables, may also reduce the generalizability of the study’s findings. Thus, a study with high internal validity (e.g., a tightly controlled laboratory experiment) often has low generalizability, and vice versa.

Generalizability and internal validity are often in conflict within a particular study.

References
## AM Last Page: How to Perform an Effective Database Search

Lauren A. Maggio, MS(LIS), MA, medical education librarian, Stanford University School of Medicine, Nancy H. Tannery, MLS, associate director for User Services, University of Pittsburgh Health Sciences Library System, and Steven L. Kanter, MD, vice dean, University of Pittsburgh School of Medicine

### 1. Choose a database

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage</td>
<td>Biomedical literature</td>
<td>Diverse disciplines, journal articles, book chapters, dissertations, abstracts</td>
<td>Education literature, journal articles, book chapters, Association of American Medical Colleges reports</td>
<td>Nursing and allied health literature, journal articles, book chapters, dissertations, audiovisuals</td>
<td>Scientific, technical, medical and social sciences literature, citation searching, journal articles, conference papers</td>
</tr>
<tr>
<td>Controlled vocabulary (See 2A)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Access</td>
<td>Open</td>
<td>Open</td>
<td>Open</td>
<td>Subscription</td>
<td>Subscription</td>
</tr>
</tbody>
</table>

### 2. Select search terms

**A. If available, use the database’s controlled vocabulary:**
- A controlled vocabulary provides one term for a concept that may have different names.
- Controlled vocabularies help create exhaustive and unambiguous searches.
- MEDLINE’s controlled vocabulary is Medical Subject Headings (MeSH). For example, *myocardial infarction* is the MeSH for heart attack. Using the term *myocardial infarction* retrieves articles on both heart attack and myocardial infarction in MEDLINE.

**B. Include synonyms and use truncation:**
- Include synonyms and abbreviations to broaden your search and to help ensure comprehensiveness for ideas not yet identified in a standard thesaurus.
- Use truncation to search for alternate endings of search terms.

### 3. Use Boolean operators to combine search terms

```
(reform OR revision) AND gme reform
```

- "OR" broadens the search
- "AND" narrows the search

### 4. Limit results

- Use limits to narrow the search.
- Apply limits one at a time to control search results.
- Popular limits include English language and date ranges.

### 5. Explain the search process in the methodology section of any report. Include the following:
- Search terms (indicate if controlled vocabulary was used)
- Boolean operators
- Databases searched
- Any limits applied
- Date of search

For additional information, consult your medical librarian.
## AM Last Page: Avoiding Five Common Pitfalls of Survey Design

Anthony R. Artino, Jr, PhD, assistant professor of preventive medicine and biometrics, Uniformed Services University of the Health Sciences, Hunter Gehlbach, PhD, assistant professor of education, Harvard University, and Steven J. Durning, MD, professor of medicine and pathology, Uniformed Services University of the Health Sciences

Writing good survey items is both an art and a science. Over the last 30 years, scholars have amassed a great deal of scientific evidence on which questionnaire designers can rely. The guidelines below present some of the most frequently ignored, but more important, of these survey-design basics.

<table>
<thead>
<tr>
<th>Pitfall</th>
<th>Survey example(s)</th>
<th>Why it's a problem</th>
<th>Solution(s)</th>
<th>Survey example(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating a double-barreled item</td>
<td>How often do you talk to your nurses and administrative staff when you have a problem?</td>
<td>Respondents have trouble answering survey items that contain more than one question (and thus could have more than one answer). In this example, respondents who talk to nurses often but talk to administrative staff infrequently will struggle to answer this question. Survey items should address one idea at a time.</td>
<td>When you have multiple questions/premises within a given item, either (1) create multiple items for each question that is important or (2) include only the more important question. Be especially wary of conjunctions in your items.</td>
<td>How often do you talk to your nurses when you have a problem? Doesn't the chief resident have a problem? Is one answer more important than the other?</td>
</tr>
<tr>
<td>Creating a negatively worded item</td>
<td>In an average week, when do you talk to nurses?</td>
<td>Negatively worded survey items are challenging for respondents to comprehend and answer accurately. Double-negatives are particularly problematic and increase measurement error. If a respondent has to say “yes” in order to mean “no” (or “agree” in order to “disagree”), the item is flawed.</td>
<td>Make sure “yes” means yes and “no” means no. This generally means wording items positively.</td>
<td>In an average week, when do you start class on time? Should the chief resident be responsible for admitting patients?</td>
</tr>
<tr>
<td>Using statements instead of questions</td>
<td>I am confident I can do well in this course.</td>
<td>A survey represents a conversation between the surveyor and the respondents. To make sense of survey items, respondents rely on “the tacit conversations in everyday life.” Only rarely do people engage in rating statements in their everyday conversations.</td>
<td>Formulate survey items as questions. Questions are more conversational, more straightforward, and easier to process mentally. People are more practiced at responding to them.</td>
<td>How confident are you that you can do well in this course? Not at all confident? Slightly confident? Moderately confident? Quite confident? Extremely confident?</td>
</tr>
<tr>
<td>Using agreement response anchors</td>
<td>The high cost of health care is the most important issue in America today.</td>
<td>Agreement response anchors do not emphasize the construct being measured and are prone to acquiescence (i.e., the tendency to endorse any assertion made in an item, regardless of its content). In addition, agreement response anchors may encourage respondents to think through their responses less thoroughly while completing the survey.</td>
<td>Use construct-specific response anchors that emphasize the construct of interest. Doing so reduces acquiescence and keeps respondents focused on the construct in question. Doing so results in less measurement error.</td>
<td>How important is the issue of high health care costs in America today? Not at all important? Slightly important? Moderately important? Quite important? Extremely important?</td>
</tr>
<tr>
<td>Using too few or too many response anchors</td>
<td>How useful was your medical school training in clinical decision making?</td>
<td>The number of response anchors influences the reliability of a set of survey items. Using too few response anchors generally reduces reliability. There is, however, a point of diminishing returns beyond which more response anchors do not enhance reliability.</td>
<td>Use five or more response anchors to achieve stable participant responses. In most cases, using more than seven to nine anchors is unlikely to be meaningful to most respondents and will not improve reliability.</td>
<td>How useful was your medical school training in clinical decision making? Not at all useful? Slightly useful? Moderately useful? Quite useful? Extremely useful?</td>
</tr>
</tbody>
</table>

### References


### Disclaimers

The views expressed in this article are those of the authors and do not necessarily reflect the official policy of the Department of Defense. Dr. Steven Durning coauthored this Last Page prior to becoming assistant editor, AM Last Page.
Qualitative research is becoming more prominent in academic medicine and health care fields, and an increasing number of publications using qualitative methods are featured in prominent journals. Thus, recognizing the different available approaches can benefit researchers of all types. While a debate may wage between proponents of qualitative versus quantitative research, both sets of methods—and often a blend of the two—offer important insights into the problems the academic medicine community faces.

<table>
<thead>
<tr>
<th>Qualitative paradigm</th>
<th>Quantitative paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>How and why events or behaviors occur in complex settings where context is important to understanding.</td>
<td>Nature of the research question</td>
</tr>
<tr>
<td>Examples: How do a diverse student body and faculty affect teaching and learning? How does a resident make the transition to attending physician? What characterizes the phenomenon of a mentor–mentee relationship?</td>
<td>How many, how often, what level, and what direction of relationships between defined variables in settings that can be decontextualized.</td>
</tr>
<tr>
<td>Examples: What is the relationship between student grades and graduation rates? What type and amount of monetary incentive or financial reward affects a medical student’s specialty choice?</td>
<td>Nature of data and analysis</td>
</tr>
<tr>
<td>Inductive by researchers (e.g., normative or transcribed text analyzed thematically for patterns)</td>
<td>Deductive by statistics (e.g., data and patterns analyzed through statistical means)</td>
</tr>
<tr>
<td>Types of designs</td>
<td></td>
</tr>
<tr>
<td>• Case study: An in-depth study of a particular case, which can be descriptive, explanatory, or exploratory</td>
<td>• Experimental: The researcher manipulates all variables including the assignment to treatment and control groups in order to discern causality</td>
</tr>
<tr>
<td>• Ethnography: Research intended to provide descriptions of systems, processes, or phenomena within their specific context; stems from anthropology</td>
<td>• Quasi-experimental: Research using an experimental variable with groups not formed through random assignment or selection</td>
</tr>
<tr>
<td>• Grounded theory: A theory developed based on the examination of data (rather than applying a predetermined theory)</td>
<td>• Surveys: Measurement procedures that involve asking questions of respondents</td>
</tr>
<tr>
<td>• Historiography: Research directed at the study of a past event, issue, or problem that uses information from the past</td>
<td>• Mixed methods: A combination of quantitative and qualitative approaches including triangulation design, embedded design, explanatory design, and exploratory design</td>
</tr>
<tr>
<td>• Phenomenology: The study of individuals’ perspectives on particular phenomena</td>
<td></td>
</tr>
<tr>
<td>• Action research: A reflective and team-based approach led by those involved in solving a particular problem</td>
<td></td>
</tr>
<tr>
<td>• Mixed methods: A combination of quantitative and qualitative approaches including triangulation design, embedded design, explanatory design, and exploratory design</td>
<td></td>
</tr>
<tr>
<td>Nature of research data</td>
<td>Data sources</td>
</tr>
<tr>
<td>Ordinal or cardinal data from surveys, financial reporting, census reports, test scores, demographics, and/or observations</td>
<td></td>
</tr>
<tr>
<td>Analytic techniques</td>
<td></td>
</tr>
<tr>
<td>• Descriptive statistics</td>
<td></td>
</tr>
<tr>
<td>• Regression</td>
<td></td>
</tr>
<tr>
<td>• Regression discontinuity</td>
<td></td>
</tr>
<tr>
<td>• Hierarchical linear modeling</td>
<td></td>
</tr>
<tr>
<td>Assessment of rigor</td>
<td></td>
</tr>
<tr>
<td>• Internal validity (e.g., through triangulation, member checking, coding check)</td>
<td></td>
</tr>
<tr>
<td>• External validity (e.g., through representativeness check)</td>
<td></td>
</tr>
<tr>
<td>• Reliability (e.g., through chain of evidence and interneter reliability check)</td>
<td></td>
</tr>
<tr>
<td>Strengths</td>
<td></td>
</tr>
<tr>
<td>• Internal validity (e.g., through study design and procedures)</td>
<td></td>
</tr>
<tr>
<td>• External validity (e.g., through criterion measurement)</td>
<td></td>
</tr>
<tr>
<td>• Reliability (e.g., through test–retest, internal consistency)</td>
<td></td>
</tr>
<tr>
<td>Weaknesses</td>
<td></td>
</tr>
<tr>
<td>• Narrow variables might not be valid</td>
<td></td>
</tr>
<tr>
<td>• Knowledge produced might be too general for direct application to specific contexts or individuals</td>
<td></td>
</tr>
<tr>
<td>• Phenomena may be missed if analysis focuses on hypothesis testing rather than hypothesis generation</td>
<td></td>
</tr>
</tbody>
</table>

References
AM Last Page: A Guide to Research Paradigms Relevant to Medical Education

Esther Bergman, MSc, PhD student, Jeanette de Feijter, MD, PhD student, Janneke Frambach, MA, MSc, PhD student, Merijn Godefrooi, MD, PhD student, Irene Sroitweg, PhD student, Renée Stalmeijer, PhD, assistant professor, Jonne van der Zwet, MD, PhD student, Maastricht University

In order to design or interpret qualitative and quantitative research, one should have some understanding of the assumptions that underpin them. Below, we provide an overview of some of the concepts underlying four philosophical paradigms in medical education research and illustrate the relationships between them.

<table>
<thead>
<tr>
<th>Paradigm: A philosophical framework that underlies and affects research activities. What are the assumptions underlying one's views on reality and knowledge? (Synonyms: theoretical or epistemological stance, world view)</th>
</tr>
</thead>
</table>
| **Positivism**  
There is one truth, and it can be observed.  
**Post-Positivism**  
There is one truth, but it can never be truly observed.  
**Critical Theory**  
Multiple truths exist, and they are influenced by power relations among people.  
**Constructivism**  
Multiple truths are constructed by and between people. |

<table>
<thead>
<tr>
<th>Ontology: Theory of the view on reality. What is the nature of physical and social reality?</th>
</tr>
</thead>
</table>
| **Realism**  
Reality is objectively observable and exists independently of the human knower. The world is operated by laws of cause and effect. Variables can be observed, measured, and predicted.  
**Critical Realism**  
Reality is assumed to exist, but evidence in research is fallible due to the complexity of the enquiry.  
**Historical Realism**  
Reality is shaped by structures of social, political, cultural, economic, ethnic, and gender factors.  
**Relativism**  
Reality is socially and experientially based; multiple realities exist, change, conflict, and/or become more crystallized. |

<table>
<thead>
<tr>
<th>Epistemology: Theory of knowledge. What are the origin, nature, and limits of knowledge about reality?</th>
</tr>
</thead>
</table>
| **Radical Objectivism**  
Knowledge is independent of the human knower. People can provide an objective, value-free description of reality.  
**Relative Objectivism**  
Knowledge is conjectural and based on hypotheses that have not yet been falsified. Objective knowledge about reality is the ideal, which cannot be achieved.  
**Relative Subjectivism**  
Knowledge is value-dependent, is influenced by power relations, and is the result of interaction between researcher and participants.  
**Radical Subjectivism**  
Knowledge consists of constructions that arise from interaction between researcher and participants. |

<table>
<thead>
<tr>
<th>Methodology: Strategic approach to answer the research question and to gain knowledge. What is the research design?</th>
</tr>
</thead>
</table>
| **Verification**  
Knowledge is gained through hypothesis generation and testing (deduction). It focuses on prediction and control of phenomena. The aim is to produce generalizable data.  
**Falsification**  
Knowledge is gained by testing if hypotheses can be disproven, using a deductive approach. Outcomes are never totally objective.  
**Transformation**  
Knowledge is gained by raising participants to a different level of consciousness and thereby empowering them.  
**Interaction**  
Knowledge is gained by an inductive approach: recognizing, understanding, developing, and contrasting constructions through dialogue. |

As illustrated below, an understanding of research paradigms can guide researchers in designing and performing medical education research. Each step invites the researcher to consider underlying assumptions about knowledge and reality within the field of medical education and related disciplines.

Suggestions for further reading:
# AM Last Page: Avoiding Four Visual-Design Pitfalls in Survey Development

Anthony R. Artino, Jr, PhD, associate professor, Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, and Hunter Gehlbach, PhD, associate professor, Harvard Graduate School of Education

A previous AM Last Page presented five common pitfalls of survey design as well as several solutions. This AM Last Page presents four visual-design and layout pitfalls and offers solutions.

## Pitfall: Explanation and Example

<table>
<thead>
<tr>
<th>Pitfall: Labeling only the end points of your response options</th>
<th>Solution: Verbally label each response option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labeling only the end points leaves the meaning of the unlabeled options open to respondents' interpretation. Different respondents can interpret the unlabeled options differently. This ambiguity increases measurement error.</td>
<td>Labeling each response option increases consistency in the conceptual spacing between response options and increases the likelihood that all respondents will interpret the response options similarly. Additionally, the response options have comparable visual weight, so the respondents' eyes are not drawn to certain options.</td>
</tr>
</tbody>
</table>

### Example:

**How interesting did you find this clinical reasoning course?**

- **Not at all interesting**
- **Slightly interesting**
- **Moderately interesting**
- **Quite interesting**
- **Extremely interesting**

**Answer:**

- **Not at all interesting**
- **Slightly interesting**
- **Moderately interesting**
- **Quite interesting**
- **Extremely interesting**

## Pitfall: Labeling response options with both numbers and verbal labels

Because of the additional information respondents must process, providing both numbers and verbal labels extends response time. The implied meaning of negative numbers can be particularly confusing and may introduce additional error. For example, in the item below, learning "a little bit" seems incongruous with learning the amount of "–1."

### Example:

**How much did you learn in today's workshop?**

- **–2**
- **–1**
- **0**
- **1**
- **2**

**Answer:**

- **Almost nothing**
- **A little bit**
- **Some**
- **Quite a bit**
- **A tremendous amount**

## Pitfall: Unequally spacing your response options

The visual spacing between options can attract respondents to certain options over others, which in turn might cause them to select these options more frequently. In addition, unbalanced spacing of the response options can shift the visual midpoint of the scale.

### Example:

**How much did you learn from your peers in this course?**

- **Almost nothing**
- **A little bit**
- **Some**
- **Quite a bit**
- **A tremendous amount**

**Answer:**

- **Almost nothing**
- **A little bit**
- **Some**
- **Quite a bit**
- **A tremendous amount**

## Pitfall: Placing nonsubstantive response options together with substantive response options

Placing nonsubstantive response options such as "don't know," "no opinion," or "not applicable" together with the substantive options can shift the visual and conceptual midpoint of the response scales, thereby skewing the results.

### Example:

**How satisfied are you with the quality of the library services?**

- **Not at all satisfied**
- **Slightly satisfied**
- **Moderately satisfied**
- **Quite satisfied**
- **Extremely satisfied**
- **Not applicable**

**Answer:**

- **Not at all satisfied**
- **Slightly satisfied**
- **Moderately satisfied**
- **Quite satisfied**
- **Extremely satisfied**
- **Not applicable**

## Solution: Explanation and Example

<table>
<thead>
<tr>
<th>Solution: Use only verbal labels</th>
<th>Solution: Maintain equal spacing between response options</th>
</tr>
</thead>
<tbody>
<tr>
<td>In general, use only verbal labels for each response option. Doing so will reduce the cognitive effort required of your respondents and will likely reduce measurement error.</td>
<td>Maintaining equal spacing between response options will reinforce the notion that, conceptually, there is equal space or &quot;distance&quot; between each response option. As a result, the answers will be less biased, thereby reducing measurement error.</td>
</tr>
</tbody>
</table>

### Example:

**How interesting did you find this clinical reasoning course?**

- **Not at all interesting**
- **Slightly interesting**
- **Moderately interesting**
- **Quite interesting**
- **Extremely interesting**

**Answer:**

- **Not at all interesting**
- **Slightly interesting**
- **Moderately interesting**
- **Quite interesting**
- **Extremely interesting**

**How much did you learn in today's workshop?**

- **Almost nothing**
- **A little bit**
- **Some**
- **Quite a bit**
- **A tremendous amount**

**Answer:**

- **Almost nothing**
- **A little bit**
- **Some**
- **Quite a bit**
- **A tremendous amount**

**How satisfied are you with the quality of the library services?**

- **Not at all satisfied**
- **Slightly satisfied**
- **Moderately satisfied**
- **Quite satisfied**
- **Extremely satisfied**
- **Not applicable**

**Answer:**

- **Not at all satisfied**
- **Slightly satisfied**
- **Moderately satisfied**
- **Quite satisfied**
- **Extremely satisfied**
- **Not applicable**

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**Disclaimer:**

The views expressed in this article are those of the authors and do not necessarily reflect the official policy of the U.S. Department of Defense.

**References:**


**Author contact:** anthony.artino@usuhs.edu
Good research in medical education is characterized by evidence that is trustworthy, applicable to (multiple) practical settings, consistent, and neutral (unbiased)—regardless of whether a qualitative or a quantitative approach is used. However, while qualitative and quantitative research share similar standards for good evidence (quality criteria), the conception and operationalization of these quality criteria differ between the two. Below, we provide an overview of these criteria and a number of techniques that researchers can use to meet them. In addition, we note that the criteria are interlinked, and that some of the techniques contribute to multiple criteria at the same time.

<table>
<thead>
<tr>
<th>Techniques to enhance quality in qualitative research</th>
<th>Quality criteria in qualitative research</th>
<th>Quality criteria in qualitative research</th>
<th>Quality criteria in qualitative research</th>
<th>Techniques to enhance quality in qualitative research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculate the sample size that is needed for sufficient statistical power (power calculation)</td>
<td>Internal validity: The extent to which observed effects can be attributed to the independent variable</td>
<td>Truth value of evidence: The extent to which the study’s findings are trustworthy and believable to others</td>
<td>Use multiple data sources (data triangulation), methods (methodological triangulation), researchers (investigator triangulation) and theories (theory triangulation)</td>
<td>Make the findings meaningful to others by describing them and their context in detail (thick description)</td>
</tr>
<tr>
<td>Describe details of the educational context and intervention</td>
<td>Use random or stratified sampling (population generalizability)</td>
<td>Applicability of evidence: The extent to which the findings can be transferred or applied in different settings</td>
<td>Collect data for an extended period of time (prolonged engagement)</td>
<td>Explain the sampling strategy (e.g., typical case sampling or maximum-variation sampling)</td>
</tr>
<tr>
<td>Avoid loss of participants or provide information on non-responses</td>
<td>Standardize treatment conditions</td>
<td>Transferability: The extent to which the findings can be transferred or applied in different settings</td>
<td>Ask feedback from participants on the data or interpretation of the data (member checking)</td>
<td>Discuss the findings’ resonance with existing literature from different settings</td>
</tr>
<tr>
<td>Maintain and safeguard the original data for accountability to journals and the public</td>
<td>Use control groups (controlled design)</td>
<td>Consistency of evidence: The extent to which the findings are consistent in relation to the contexts in which they were generated</td>
<td>Collect data until no new themes emerge (saturating)</td>
<td>Search the data and/or literature for evidence that disconfirms the findings</td>
</tr>
<tr>
<td>Use blinded assessors or coders during data-gathering</td>
<td>Calculate the sample size that is needed for sufficient statistical power (power calculation)</td>
<td>Dependability: The extent to which the findings are generated</td>
<td>Continuously analyze the data to inform further data collection (iterative data collection)</td>
<td>Discuss the research process and/or findings with peers/experts (peer debriefing)</td>
</tr>
<tr>
<td>Anonymize respondent identities</td>
<td>Replicate the study in other contexts (ecological generalizability)</td>
<td>Neutrality of evidence: The extent to which the findings are based on the study’s participants and settings instead of researchers’ biases</td>
<td>Continuously re-examine the data using insights that emerge during analysis (iterative data analysis)</td>
<td>Keep a diary to reflect on the process and the researcher’s role and influence (reflectivity)</td>
</tr>
<tr>
<td>Let the facts speak for themselves</td>
<td>Verify predicted relationships between dependent and independent variables (construct validation)</td>
<td>Confirmability: The extent to which the findings are meaningful</td>
<td>Be flexible and open towards the process and topic (flexible emergent research design)</td>
<td>Document the steps and decisions taken in the research, and their motives (audit trail)</td>
</tr>
</tbody>
</table>

Suggested for further reading:
Experimental research is a scientific method that aims to provide evidence for cause-and-effect relations.1,2 One or more independent variables are systematically manipulated to determine the effect(s) on a dependent variable while controlling other relevant factors. Often, the goal is to present five common pitfalls and ways to avoid them.

<table>
<thead>
<tr>
<th>Pitfall</th>
<th>Explanation of the problems and examples</th>
<th>Recommended solutions</th>
<th>Good example from the literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using an inappropriate control condition</td>
<td>When you compare an experimental condition with a control condition, then you can attribute differences in outcome to differences between the conditions. If these conditions vary on too many elements, it is impossible to attribute outcomes to a specific element. • If you compare Web-based learning with lectures, which differ in many aspects (e.g., learning pace, interaction with peers and teachers), you won’t know which aspect(s) of these learning modes caused differences in outcomes.</td>
<td>• Identify the crucial element of your intervention. • Make the experimental and control conditions as similar as possible, except for the crucial element.</td>
<td>Issa et al3 compared a lecture that was designed according to multimedia principles with a lecture that was not designed according to these principles, but similar in every other aspect.</td>
</tr>
<tr>
<td>Failing to align your outcome measures with your research questions</td>
<td>Outcome measurements should reflect the dependent variable(s) stated in your research question(s). If your outcome measures do not match your theory, your results do not answer your research questions. • If you expect that students learn communication skills better when they have contact with real instead of simulated patients, you should measure communication skills rather than knowledge or perceptions about communication.</td>
<td>• When designing a study, first clarify expected effects. • Next, define how you can observe these effects. • Then decide which instruments measure these effects.</td>
<td>Cook et al4 operationalized their dependent variable (learning outcomes) with two test types: a post-test after each module and a cumulative test.</td>
</tr>
<tr>
<td>Ignoring possible reactive effects of a pretest</td>
<td>A pretest could provide information on baseline differences between participants. However, a pretest can cause participants to acquire relevant information. Therefore, the pretest can reinforce your intervention or have a direct effect on the dependent variable(s) that you measure with the posttest. • If you ignore effects of a pretest that assesses prior knowledge, you won’t know whether your results can be attributed solely to your intervention.</td>
<td>In a nonrandomized design: • Let students do an irrelevant task between the pretest and intervention. • Use existing data (e.g., grades) as a pretest. In a randomized design: • Don’t use a pretest.</td>
<td>Hatala et al5 randomly allocated students to one of two instructional approaches and didn’t use a pretest to investigate the superiority of one of these approaches.</td>
</tr>
<tr>
<td>Not taking time-on-task into account</td>
<td>It is likely that increased time spent on learning tasks yields increased learning outcomes. If you do not take this into account, it is impossible to attribute your outcomes solely to the variables you measured because they might be explained by differences in time-on-task as well. • If you compare Web-based learning with lectures, the time-on-task is the actual time spent on the study activities.</td>
<td>• Design conditions so that participants spend the same amount of time on the task. • Control for time-on-task in statistical analyses if there are differences between conditions.</td>
<td>In Mamede et al6 the time participants were allowed to spend on each study case was the same for all conditions.</td>
</tr>
<tr>
<td>Confusing ecological and external validity</td>
<td>Ecologically valid experiments do not necessarily have high external validity. Ecological validity is the extent to which your study approximates the real world. It often introduces elements (e.g., teacher characteristics, motivation) that mask or change effects, which, in turn, may compromise the external validity or generalizability of your study. • If you investigate effects of an individual assignment in a classroom setting, student interaction can influence the effect and thus compromise external validity.</td>
<td>• Focus on external validity instead of ecological validity. • Achieve high external validity by conducting a well-controlled experiment that is repeated in different settings and populations.</td>
<td>Marquard et al7 investigated patient identification errors, controlling for the number and type of errors identified, during medication administration.</td>
</tr>
</tbody>
</table>

References:

Author contact: m.vanloon@maastrichtuniversity.nl
All medical schools and teaching hospitals in the United Kingdom – England, Scotland, Wales, and Northern Ireland – operate as academic health centers (AHCs) under an “unlinked partners” model, characterized by minimal structural integration. Despite a need for high functional integration, UK medical schools are unable to cross-subsidize research and education from patient care revenues. Instead, they must fully fund research through competition in three main funding sectors: government and its agencies, medical research charities (philanthropic foundations), and the pharmaceutical and medical device industries. Recent years have seen a growth in funding for UK clinical research, an increased share of funding by government; and continuing concentration of funding in the “golden triangle” formed by Cambridge, London, and Oxford.

The "unlinked partners" model of AHCs
- All 34 UK medical schools are part of universities – independent not-for-profit higher education institutions (HEIs) funded approximately equally by public and private sources.
- All 44 UK university hospitals are National Health Service (NHS) organizations – statutory public bodies accountable to government and funded almost entirely through general taxation.
- Medical schools employ some 3,500 academic physician-scientists who have honorary contracts with the NHS and provide expert care to patients in affiliated NHS hospitals. In return, NHS physicians undertake the clinical teaching of undergraduate medical students. Under long-standing agreements, no payments are made between university and NHS institutions for these contributions.

Major funders of academic research
- As of 2012 (see notes below), funding of academic research in clinical medicine amounts to £1.561 billion, i.e. 35% of HEIs’ total research income and 64% of HEIs’ research income in all pre-clinical and health-related subjects.
- Taxpayers fund 48% of academic research in clinical medicine via the governments of the UK countries and the European Union. Control of this funding is divided between central (“federal”) government (the National Institute for Health Research) and arm’s-length higher education and research funding councils. Among the latter, the most important for clinical research is the Medical Research Council.
- Historical endowments and current giving by the public funds 40% of academic research in clinical medicine via medical research charities, of which the Welcome Trust, Cancer Research UK, and the British Heart Foundation are the largest.

Trends over the last decade
- The funding of academic research in clinical medicine has more than doubled over the last decade.
- The main source of funding has shifted from UK charities to UK government, predominantly owing to an increased investment in translational research in NHS/university partnerships by the National Institute for Health Research.
- UK industry’s investment in academic research and development has flattened, and its share has more than halved.
- UK medical schools have strengthened their international competitiveness as indicated by the growth of funding from global industry and other international sources.

Geographical concentration of research
- Over the last decade, the 10 most research-intensive medical schools in south-east England, north-west England, and Scotland (as depicted on the graph) have attracted two out of every three pounds of funding for academic research in clinical medicine.
- This funding predominantly covers the direct costs of research, such as consumables and researcher salaries, and has an element of indirect (overhead) costs recovery, which varies from grant to grant and from university to university.
- The highest geographical concentration of academic research in clinical medicine is clustered in south-east England – in the “golden triangle” of Cambridge, London, and Oxford.
CHAPTER 11: Military Medicine

Paths to National Service as a Military Physician
Caring for Women Veterans
The Military-Unique Curriculum at USU

The USU curriculum includes over 700 hours of military-specific training (e.g., disease prevention, health promotion, epidemiology, tropical medicine, emerging infectious diseases, disaster medicine, and field exercises). Some components of this curriculum include:

<table>
<thead>
<tr>
<th>MS-I Year</th>
<th>MS-II Year</th>
<th>MS-III Year</th>
<th>MS-IV Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Military Studies I</strong></td>
<td><strong>Military Medical Field Studies</strong></td>
<td><strong>Military Studies II</strong></td>
<td><strong>Military</strong></td>
</tr>
<tr>
<td>Introduction to Military Medicine</td>
<td>Operation Kerkesner</td>
<td>Hospital command</td>
<td>Contingency Medicine</td>
</tr>
<tr>
<td>Leadership, force structure, combat injuries, medical logistics, etc.</td>
<td>Leadership, force structure, combat injuries, medical logistics, etc.</td>
<td>Traumatic brain injury, medical intelligence, aeromedical evacuation, terrorism, hemostatic agents, humanitarian relief, disaster medicine, etc.</td>
<td>Biological threats, command and control, medical planning, medical threat assessment, military medical ethics, battalion aid stations, etc.</td>
</tr>
<tr>
<td><strong>Combat Medical Skills</strong></td>
<td><strong>Patient Actor in Bushmaster</strong></td>
<td><strong>No formal didactics on military-unique topics</strong></td>
<td><strong>Operation Bushmaster</strong></td>
</tr>
<tr>
<td>Splinting, bandaging, triage, etc.</td>
<td>Students learn patients’ perspective by serving as wounded soldiers</td>
<td>However, students rotate in military hospitals and care for active duty and retired military and/or their dependents</td>
<td>1-week battlefield capstone exercise; serves as military medicine final practical exam; focuses on patient care during simulated combat conditions: e.g., medical evacuation, vehicle loading, land navigation, combat stress control</td>
</tr>
<tr>
<td><strong>Military Applied Physiology</strong></td>
<td><strong>Operational Clerkship</strong></td>
<td><strong>Emergency Medicine Clerkship</strong></td>
<td></td>
</tr>
<tr>
<td>Microgravity, sleep, circadian rhythms, physical fitness, nutrition, hypo/hyperbarics, etc.</td>
<td>3-week summer experience with military unit/school</td>
<td>Evaluation, management, and disposition of acute injury and illness</td>
<td></td>
</tr>
</tbody>
</table>

Courses are shown in blue, and field exercises are shown in green.

<table>
<thead>
<tr>
<th>USU</th>
<th>HPSP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application process</strong></td>
<td><strong>Apply to civilian medical school via school admissions process, then apply to HPSP through service-specific medical recruiter (Army, Navy, or Air Force).</strong></td>
</tr>
<tr>
<td><strong>Pay</strong></td>
<td>Monthly stipend, currently $1,992/month for 10.5 months; 45 days of active-duty pay as an O-1; one-time critical skills accession bonus of $20,000.</td>
</tr>
<tr>
<td><strong>Active duty benefits</strong></td>
<td>Full active-duty benefits for self only when on 45 days of active duty.</td>
</tr>
<tr>
<td><strong>Military preparation</strong></td>
<td>No prior military experience required. Prior to matriculation, most students attend a 4- to 6-week officer-orientation program.</td>
</tr>
<tr>
<td><strong>Tuition, books, and fees</strong></td>
<td>Full tuition paid by HPSP to maximum of 4 years; some school-required fees and expenses not covered.</td>
</tr>
<tr>
<td><strong>Service obligation</strong></td>
<td>Generally, 4 years of active duty after completing graduate medical education (depending on scholarship length).</td>
</tr>
</tbody>
</table>

**For additional information:**
1. F. Edward Hébert School of Medicine. What you need to know (pamphlet). Bethesda, Maryland: USU; 2010.
2. USU Admissions Office: www.usuhs.mil/admissions.html; (800)772-1743, (301)295-3101; e-mail: admissions@usuhs.mil
AM Last Page: Caring for Women Veterans
Stacy Garrett-Ray, MD, MPH, MBA, deputy director, Comprehensive Women’s Health, Department of Veterans Affairs, University of Maryland School of Medicine; Laura Veet, MD, director, Women’s Health Education, Department of Veterans Affairs, University of Pennsylvania School of Medicine; Judy Brannen, MD, MBA, clinical director, Undergraduate and Graduate Medical Education, Department of Veterans Affairs, Virginia Commonwealth University, U.S. Navy Veteran; Samina Iqbal, MD, senior consultant, Department of Veterans Affairs Women Veterans Health, Stanford University School of Medicine

Providers other than Veterans Affairs (VA) physicians care for women veterans.

- The number of women veterans is increasing; in fact, women represent 15% of active duty military and are the fastest growing subpopulation of veterans.1
- However 83% of women veterans receive health care outside of VA, at academic medical centers and community practices.2-4
- VA understands women veterans’ unique needs and is educating physicians (so far, nearly 1,500 have received training1), but those who practice outside VA may be unaware of the unique concerns, risks, care, and rights of women veterans.

Providers should know what to do for patients who are women veterans.3

- Ask, “Have you served in the military?”; women do not always self-identify as veterans.
- Get to know the woman; get a military history.

Providers should be aware of more than just the health risks common to women veterans.

- Understanding her military experience is vital to understanding her health.
- Currently women in the military may serve in many roles in all branches of service; they serve as cadets in service academies, in ranks from enlisted personnel to senior officers, and in operational and support roles.
- Common diagnoses for women veterans include the following:
  - Musculoskeletal conditions and chronic pain, experienced by 50% of Iraq and Afghanistan women veterans;9
  - Post Traumatic Stress Disorder, experienced by 20% of Iraq and Afghanistan women veterans, and by 27% of Vietnam women veterans;10
  - Military Sexual Trauma, experienced by 1 in 5 women seen by VA.7
  - VA benefits for women veterans include health care, homelessness services, education, and job training.

Providers should be aware of health risks common to women veterans.

**Risks for Women Veterans by Era**

<table>
<thead>
<tr>
<th>Era</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iraq and Afghanistan</td>
<td>• Traumatic brain or spinal cord injury</td>
</tr>
<tr>
<td></td>
<td>• Embedded fragments (e.g., shrapnel)</td>
</tr>
<tr>
<td></td>
<td>• Multi-drug resistant acinetobacter</td>
</tr>
<tr>
<td></td>
<td>• Blast injuries (e.g., penetrating and/or blunt trauma, burns)</td>
</tr>
<tr>
<td></td>
<td>• Dermatologic issues (e.g., rash)</td>
</tr>
<tr>
<td></td>
<td>• Reproductive health issues (e.g., menstruation disorders, inflammatory disease of cervix, vagina, and vulva)</td>
</tr>
<tr>
<td></td>
<td>• Vision loss</td>
</tr>
<tr>
<td></td>
<td>• Traumatic amputation</td>
</tr>
<tr>
<td></td>
<td>• Rabies risk</td>
</tr>
<tr>
<td></td>
<td>• Mental health issues</td>
</tr>
<tr>
<td>Gulf War</td>
<td>• Dermatologic issues (e.g., rash)</td>
</tr>
<tr>
<td></td>
<td>• Infectious diseases (e.g., Leishmaniasis)</td>
</tr>
<tr>
<td></td>
<td>• Reproductive health issues (e.g., menstruation disorders, inflammatory disease of cervix, vagina, and vulva)</td>
</tr>
<tr>
<td></td>
<td>• Depleted uranium</td>
</tr>
<tr>
<td></td>
<td>• Exposure to smoke from well fires and petroleum</td>
</tr>
<tr>
<td></td>
<td>• Possible side effects of Anthrax, smallpox, and other immunizations</td>
</tr>
<tr>
<td>Vietnam War</td>
<td>• Hepatitis C from the transfusion of untested blood and/or drug injection/experimentation</td>
</tr>
<tr>
<td>WWII / Korean War</td>
<td>• Agent Orange exposure</td>
</tr>
<tr>
<td></td>
<td>• Exposure to nuclear weapons (including testing or cleanup)</td>
</tr>
<tr>
<td></td>
<td>• Cold injury (e.g., frostbite, hypothermia)</td>
</tr>
</tbody>
</table>

Disclaimer: The contents contained herein do not represent the official views of the Department of Veterans Affairs or the United States Government.

References:
3. VHA ADUSH for Policy and Planning.
4. VSSC Data Portal.
5. Epidemiology Program Post-Deployment Group, Office of Public Health, Veterans Health Administration, Department of Veterans Affairs, March 2012.

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CHAPTER 12:
Osteopathic Medicine

Osteopathic Medicine in the U.S.
AM Last Page: Osteopathic Medicine in the U.S.A.
Mark Cummings, PhD, Associate Dean, and Jon Rohrer, PhD, D Min, Associate Director, Statewide Campus System, Michigan State University College of Osteopathic Medicine

Growth in Enrollment at Colleges of Osteopathic Medicine (COMs)

Past and Future Trends

• By 2012, projected first-year COM enrollment is expected to be 5,227, an increase of 937 (22%) from 2007.
• The American Osteopathic Association (AOA) currently accredits 25 COMs and 3 branch campuses, 9 of which were founded after 2000.
• Between 2003 and 2007, the number of women in the first-year class increased from 1,662 to 2,142, a 29% jump. The overall gender distribution for the 2007 first-year class was 47.6% female and 52.4% male.

Sources:
1. www.aacom.org/about/fastfacts/Documents/FF-OME5yrprojections.pdf
2. www.aacom.org/people/colleges/Pages/default.aspx

Trends in the AOA Match Program for Postdoctoral Positions

Supply and Demand for AOA Programs

• Between 2000 and 2006, 618 (29.2%) of all new AOA-accredited postdoctoral programs were located at institutions that also sponsor Accreditation Council of Graduate Medical Education (ACGME)-accredited programs.
• In 1988, 85.1% of doctor of osteopathic medicine (DO) graduates matched into AOA-accredited postdoctoral programs. Over the past 21 years, the percentage fell to 38.5% in 2009.
• From 2004 through 2008, 69.5% of DOs in the National Resident Matching Program were selected for ACGME postdoctoral programs. The majority of unsuccessful DO candidates (531 in 2008) returned to fill open positions in osteopathic programs.

Sources:
1. AOA Department of Education. “White Paper on Dual and Parallel Programs.” [Internal document].
3. National Resident Matching Program: Results and Data, 2008 Main Residency Match. April 2008

Trends in Primary Care

• The percentage of primary care DOs and MDs has remained fairly constant since 1994. A modest increase in DOs practicing in internal medicine and pediatrics has occurred.
• Approximately one third of MDs (from 214,369 [31.3%] in 1994 to a peak of 322,242 [34.9%] in 2006) are in primary care as opposed to over half of DOs (from 12,183 [43.9%] in 1994 to 24,804 [58.4%] in 2007).
• While the percentage of MDs in primary care has remained fairly stable, the percentage of DOs gradually increased from 1994 to 2007.
• While a significant percentage of DOs are involved in primary care, they represent 7.3% of the total physician workforce in primary care in 2007 (i.e., 24,804 of 341,350 total primary care physicians).

MDs and DOs in Primary Care

CHAPTER 13:
10 Years of Project Medical Education (PME)
AM Last Page: 10 Years of Project Medical Education (PME)
Sallyann Bergh, MPA, Senior Communications Specialist, Association of American Medical Colleges, Washington, DC

Mission: To work with America’s medical schools and teaching hospitals to inform Congress, other policy makers, and opinion leaders about medical education for the benefit of all Americans.

PME’s Key National Messages
Medical education is...
- The foundation and future of our nation’s health care system;
- The process of cultivating the next generation of doctors who will provide timely care to the public;
- A complex, collaborative process requiring reliable, consistent funding; and
- In jeopardy if we ignore and do not continue to educate policy makers.

10 Years of PME
PME Program Distribution
(Shading signifies a state in which a program has been held.)

By the Numbers
- 129 PME programs at 62 institutions in 27 states and the District of Columbia
- 550+ state policy maker participants
- 350+ U.S. Senate and participants from House of Representatives (including both members and staff)

PME Progress

Identified Knowledge Gaps Among Congressional Staff:
- The number of years of education and training required to become a physician;
- The costs involved in the funding of medical schools and teaching hospitals;
- The role of faculty in research and patient care;
- The role of research in education and patient care;
- The level of care academic medical centers provide for the underserved;
- The level of community service faculty, residents, and students provide; and
- The interdependence of the academic missions of patient care, research, and education

How PME Reduces Knowledge Gaps
Participants...
- Play the roles of medical students, residents, and faculty physicians;
- Perform hands-on interactive exercises such as patient simulation, suturing, and clinical rotations;
- Hear firsthand from medical students, residents, and young researchers; and
- Build relationships with medical school and teaching hospital leaders, faculty, and staff.

1These knowledge gaps were identified through AAMC research conducted in 1999 with seven members of Congress and a number of congressional staff; this research helped to shape the PME program.
CHAPTER 14:
Regional Medical Campuses

Truths About the Rural Physician Supply
Regional Medical Campuses

AM Last Page: Truths About the Rural Physician Supply

Howard K. Rabonowitz, MD, Ellen M. and Dale W. Garber Professor of Family Medicine and director, Physician Shortage Area Program, Jefferson Medical College of Thomas Jefferson University

Rural areas lack an adequate supply of physicians, including primary care physicians (PCPs); i.e., family physicians, general internists, and general pediatricians compared with non-rural areas. However, people living in rural areas have more medical need, being sicker, older, and poorer than those in non-rural areas.1

• While 20% of the U.S. population lives in rural areas, only 9% of physicians practice there.1
• Non-metropolitan areas have 59 PCPs / 100,000 population vs. 94 PCPs / 100,000 population in metropolitan areas.2

Comprehensive medical school rural programs (MSRPs) are among the most successful ways to increase the rural physician supply.3

• If all U.S. medical schools had small MSRPs with 10 students per class, the number of rural physicians produced would more than double.
• 79% to 87% of graduates from the 2 MSRPs with long-range rural outcomes remained in rural family practice long term (i.e., 11 to 16 years at PSAP and up to 20 years at UM Duluth).
• Despite concerns regarding the quality of students in MSRPs, studies have shown their academic performance to be similar to that of their peers.
• The recently passed Affordable Care Act legislation authorized a new Rural Physician Training Grants program to provide grants to medical schools to develop or expand MSRPs.

Admissions policies are critical in increasing the supply of rural physicians.5

• Among the myriad of factors related to practicing rural primary care, two known at the time of matriculation to medical school — having a rural background and specialty plans for family medicine — are the most powerful predictors with the strongest supporting evidence.
• The vast majority of those who became rural PCPs had one or both of these factors.
• Less than 2% of physicians with neither a rural background, nor initial plans for family medicine, became rural PCPs — no matter what happened in the years between admissions and practice (e.g., location of residency training, or the influence of their spouse or partner).5

Rural physicians have higher incomes than non-rural physicians when income is adjusted for specialty and cost of living.6

• While all urban physicians on average have higher incomes than all rural physicians, much of this disparity is due to the different distribution of PCPs versus non-PCP specialists in these areas. When adjusted for specialty and for the lower cost of living in rural areas, average rural physician incomes are actually significantly higher than those of physicians in urban areas (see figure).
• Rural physicians work an average of 2 hours more per week than urban physicians; however, most urban physicians spend more than 2 additional hours weekly commuting to work than do rural physicians.

CHAPTER 15: Special Studies

Applicant Pathways to a U.S. Physician Career

Master’s Degree in Health Professions Education Programs

Longitudinal Integrated Clerkships
Special Studies

AM Last Page: Applicant Pathways to a U.S. Physician Career

Contributor: Paul Jolly, PhD, Senior Director of Special Studies, AAMC, Washington, DC

U.S. applicants

International applicants

AAOMAS

AMCAS

ACGME

COMLEX

USMLE

NBME

NBOME

ACCOMAS

AMCAS

Over 2,000 international medical schools

U.S. MD schools

NBME USMLE Step 1, 2CK, 2CS

ECFMG certification

130 U.S. MD schools

25 U.S. DO schools

2CE, 2PE

Osteopathic internship

Osteopathic residency

NBME COMLEX Level 3

ACGME PGY1 residency

ACGME residency (after PGY1)

State licensure authorities

Licensed U.S. practicing physicians

U.S. MD students take USMLE Step 1, 2CS, 2CK, and in most schools are required to pass these examinations prior to graduation. DO students must pass COMLEX Level 1, 2CE and 2PE prior to graduation. International medical graduates must pass USMLE Step 1, 2CK and 2CS and document graduation to be certified by the ECFMG. Graduation from medical school and passage of Level 1 or Step 1 and 2 examinations are required of U.S. MD and DO graduates. Certification by the ECFMG is required of international graduates. In order to begin a residency program, physicians who successfully complete both a residency and the examination cycle are eligible to apply for licensure.

AACOMAS = American Association of Colleges of Osteopathic Medicine Application Service
ACGME = Accreditation Council for Graduate Medical Education
AMCAS = American Medical College Application Service
COMLEX = Comprehensive Osteopathic Medical Licensing Examination
USMLE = United States Medical Licensing Examination
NBME = National Board of Medical Examiners
NBOME = National Board of Osteopathic Medical Examiners
CE = Cognitive Evaluation
PE = Performance Evaluation
CK = Clinical Knowledge
CS = Clinical Skills
PGY1 = postgraduate year 1
ECFMG = Educational Commission for Foreign Medical Graduates
Just 15 years ago, the number of master's degrees in health professions education (HPE) programs worldwide was in the single digits. Today, there are 121 such programs, with new HPE programs created annually. The purpose of this AM Last Page is to provide information about the existing master's degree in HPE programs, with a focus on location, core content, and program characteristics.

### Master's degree in HPE programs worldwide

- United States (32)
- Canada (9)
- United Kingdom (31)
- Europe minus UK (15)
- Australia (5)
- Asia (15)
- Middle East (6)
- Latin America (6)
- Africa (2)
- Total (121)

### Major reasons for increased demand in HPE programs

1. Career tracks (e.g., clinical educator/scholar)
2. Institutional requirement for some positions
3. Accreditation bodies:
   - Accreditation Council for Graduate Medical Education (ACGME; competencies)
   - Liaison Committee on Medical Education (LCME; review criteria)
   - Royal College of Physicians and Surgeons, Canada (CanMEDS Physician Competency Framework)
4. Unique demand by field of medicine (depth and breadth of knowledge/skills required to educate)
5. Professionalization of HPE

### Typical students enrolled in master's degree in HPE programs

- Physician educators
- Allied health professionals
- Clinical educators
- Medical educators
- Program directors
- Department heads
- Institutional leaders
- Scholars

### Instructional delivery methods for the 121 master's degree in HPE programs worldwide

- **Face-to-face only** (2)
- **Distance/online only** (11)
- **Face-to-face and distance/online** (54)
- **Information unavailable** (9)

### HPE core content

The core content of HPE programs varies widely, however, most master's degree programs provide foundational knowledge and skills focused on the theory, research, and practice of education as it applies to the health professions. In many HPE programs, the core content can be categorized into five domains of knowledge and skills. These domains, and sample topics typically included within each, are presented below:

#### Teaching and Learning

- Theories of learning and motivation
- Feedback
- Clinical teaching
- Simulations
- Small- and large-group teaching

#### Curriculum Development

- Curricular approaches
- Blueprinting
- Needs assessments
- Course goals and objectives
- Curriculum evaluation

#### Evaluation and Assessment

- Assessment methods
- Validity and reliability
- Performance tests
- Psychometrics
- Standard setting

#### Research Methods

- Types of scholarship
- Quantitative methods
- Qualitative methods
- Mixed-method designs
- Grant writing

#### Leadership and Management

- Leadership models
- Organizational structures and culture
- Power and authority
- Creative and strategic management
- Conflict resolution

### Characteristics of typical master's degree in HPE programs

- Average time to complete degree = 2 years
- Total credit hours for degree = 32 to 36 credits
  (1 credit hour = 1 contact hour of lecture or 2 to 3 contact hours of tutorial or group discussion per week over a 15-week semester.)
- Most programs are very prescriptive, with many required courses and very few electives
## AM Last Page: Longitudinal Integrated Clerkships

**Professor Jennene Greenhill, PhD, MSPD, associate dean and director, Flinders University Rural Clinical School and Associate Professor Lucie Walters, PhD, MBBS, Rural Medical Education, Flinders University Rural Clinical School**

Longitudinal integrated clerkships (LICs) represent a pedagogical and theoretical paradigm shift in health professional student clinical education. They occur when short block rotations are replaced by longer clinical immersion experiences (of at least a semester) during which students:

- participate in comprehensive care of patients over time,
- participate in continuing learning relationships with these patients’ clinicians, and
- meet the majority of the year’s core clinical competencies across multiple disciplines simultaneously through these experiences.

### Continuity and Symbiosis are key LIC concepts.

Continuity facilitates symbiotic relationships at multiple system levels:

- **The microsystem**—At the personal level LICs help foster clinician-to-patient relationships and shape physicians’ professional identity.
- **The mesosystem**—At the nexus between health services and the university, LICs improve quality and safety and facilitate research partnerships.
- **The macrosystem**—LICs promote community–government relationships and provide social and human capital by involving students in community-engaged learning that attracts and retains clinicians.

### The relationships fostered by LICs among students, faculty clinicians, and communities have wide, lasting outcomes.

<table>
<thead>
<tr>
<th>For students</th>
<th>For clinicians</th>
<th>For communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Equivalent or better academic results</td>
<td>• Improved reward-to-effort ratio and job satisfaction</td>
<td>• Altruistic, person-centered clinicians</td>
</tr>
<tr>
<td>• Clinical mastery</td>
<td>• Meaningful relationships with near peers</td>
<td>• Improved interprofessional practice skills</td>
</tr>
<tr>
<td>• Being part of the team</td>
<td>• Work-ready graduates</td>
<td>• Workforce for underserved areas</td>
</tr>
</tbody>
</table>

### Sound theory underpins LICs.

- **Cognitivism**<sup>1</sup>
  - Knowledge is meaningful when acquired within a clinical community of practice with specific norms, symbols, and rituals of power (such as clinical notes, investigation results, and ward rounds).
  - Students learn to be doctors by applying knowledge and skills rather than learning about medicine.

- **Situated learning**<sup>2</sup>
  - Continuity in clinical learning reduces cognitive load. Learners are more familiar with their surroundings, which results in greater working memory to learn while in the clinical environment.
  - Integrating knowledge and skills in the care of each patient provides emotional cues for recalling knowledge and develops schema for clinical reasoning.

- **Transformative learning**<sup>3</sup>
  - Students begin to transition to clinicians when they experience a disorientating process that takes them out of their comfort zone and when they reflect on their experiences.
  - Students change their worldviews (values, personal identity, and self-expectations) guided by peers and clinical supervisors; they try different roles and engage in critical discourse to become work-ready clinicians.

### LICs are educationally sound and potentially benefit all.

**References**


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CHAPTER 16: Workforce

Physician Assistants

Geriatric Workforce

Doctor of Nursing Practice

Increasing Workforce Diversity

The Doctor of Pharmacy (PharmD) Degree

Practice Characteristics of Racial and Ethnic Minority Graduates of U.S. MD-Degree-Granting Medical Schools

Truths About the Rural Physician Supply

The Federal Budget and Academic Medicine

Medical Students' Plans at Graduation and Their Relationship with Actual Practice
AM Last Page: Physician Assistants

Contributors: Nicole Gara, AAPA* VP, Advocacy and Government Affairs; Howard Glassroth, AAPA VP, Communications

What is a Physician Assistant?

Physician assistants (PAs) are graduates of accredited PA educational programs who are licensed by the states to practice medicine with physician supervision. PAs work in concert with physicians to provide high-quality, cost-effective care for patients in all medical and surgical specialties and settings.

- Anatomy
- Physiology
- Biochemistry
- Microbiology
- Pathology
- Pathophysiology
- Pharmacology
- Clinical laboratory sciences
- Physical diagnosis
- Behavioral sciences
- Differential diagnosis
- Medical ethics

More than 400 hours in basic sciences, 75 hours in pharmacology, 175 hours in behavioral sciences, and nearly 580 hours in clinical medicine.

PAs are required to pass a national certifying examination administered by the National Commission on Certification of Physician Assistants.

To keep the certification current, PAs must earn and log 100 hours of continuing medical education every two years and take a recertification exam every six years. PAs must have a license and a supervising physician before they can practice.

2008 Vital Statistics

- 73,893 PAs in clinical practice
- 257 million visits to PAs
- 332 million medications prescribed or recommended by PAs
- 50 states authorize PA prescribing

Growth of the PA Profession

Education

There are more than 140 accredited PA educational programs in the United States, located at academic medical centers, colleges, and universities. Most award a master’s degree.

Clinical rotations

2,000 hours with an emphasis on primary care in ambulatory clinics, physicians’ offices, and acute/long-term care facilities.

- Family medicine
- Pediatrics
- Internal medicine
- General surgery
- Emergency medicine
- Psychiatry
- Obstetrics/gynecology

PA Work Settings

Solo physician practices 10%
Rural clinics 3.5%
Hospitals 38.2%
Group practices 33.4%
Other 10.9%
Community health centers 4%

Source: AAPA 2008 Annual PA Census

*American Academy of Physician Assistants, Alexandria, Virginia
AM Last Page: Geriatric Workforce

The demand for geriatricians will increase significantly over the coming decades.

High-Risk Elderly Population
- 1 out of 3 people aged 75+ have 3 or more chronic conditions.
- The number of patients with Alzheimer’s Disease is projected to increase 27% by 2020 and 70% by 2030.
- High-risk patients who are seen by a geriatrics team are one-third less likely to lose functional ability compared to those who see their usual physician.

Sources:

The current supply of geriatricians is low and unlikely to grow, much less meet rising demand.

Current Supply of Geriatricians
- There are 12,575 active geriatricians (<2% of all active physicians).
- 37.8% are international medical graduates compared to 24.0% for all specialties.
- 39.7% are aged 55 or older compared to 37.6% for all specialties.
- 34.6% are female compared to 28.3% for all specialties.

Source: AMA Masterfile, January 2008

However, U.S. medical schools are placing increased emphasis on geriatrics training with positive results.

Geriatric Faculty, Divisions, and Departments
- The number of full time geriatrics faculty has increased 12.0% from 1,193 in 2001 to 1,336 in 2007.
- There are currently 30 medical schools with one or more divisions of geriatrics and 8 with departments of geriatrics, whereas, in 1978 there were only 2 schools with divisions and 2 with departments.

Source: AAMC Faculty Roster
AM Last Page: Doctor of Nursing Practice (DNP)

By the Numbers

- 92 Institutions now offering DNP programs
- 39 New DNP programs in 2008
- 104 New DNP programs under development
- 34 States with DNP programs (the District of Columbia also has a DNP program)

Latest Developments

According to AACN’s most recent survey, the top six major areas of study in DNP programs are Nursing Practice, Clinical Nurse Specialty, Nurse Anesthesia, Nurse Midwifery, Administration, and Community Health/Public Health.

Schools nationwide that have initiated the DNP programs are reporting sizable and competitive student enrollment.

Employers are recognizing the unique contribution these expert nurses are making in the practice arena, and the demand for DNP-prepared nurses is growing.

For the latest developments on nursing’s move to the DNP, visit (http://www.aacn.nche.edu/DNP).

Source: AACN. Research and Data Center, 2009.

Doctoral Programs in Nursing

On October 25, 2004, the member schools affiliated with the AACN voted to endorse the AACN Position Statement on the Practice Doctorate in Nursing. This decision called for moving the current level of preparation necessary for advanced nursing practice from the master’s to the doctorate level by the year 2015. The DNP is designed for nurses seeking a terminal degree in nursing practice and offers an alternative to research-focused doctoral programs. DNP-prepared nurses are well equipped to fully implement the science developed by nurse researchers.

Enrollments in and Graduations from DNP Programs

Since the endorsement of the DNP position statement, the number of enrollments in and graduations from these programs has nearly doubled every year from 2003 to 2008.

Number and Type of Nursing Doctoral Programs in the United States (2006-2008)
Workforce

AM Last Page: Increasing Workforce Diversity

Michael J. Dill, MPAP, Senior Data Analyst, and Normal. Poll-Hunter, PhD, Director, Summer Medical and Dental Education Program (SMDEP), Association of American Medical Colleges (AAMC)

Baseline Physician FTE Supply and Demand Projections, 2006–2025

Demand
Supply
Projected shortage
2005
2025

Baseline Physician FTE Supply and Demand Projections, 2006–2025

- The AAMC recommended a 30% increase in medical school enrollment as part of a broad strategy to address a projected shortfall of 124,000 full-time equivalent (FTE) physicians in 2025. 1
- Much of the anticipated shortage can be attributed to rising demand from growth of an increasingly diverse population. 1
- Of the total projected U.S. population growth for 2006–2025, 45% will be among Hispanics, 18% among Blacks, 14% among Asians, and 17% among non-Hispanic Whites. 2

Population

- Relative to the U.S. population, Hispanics, Blacks/African Americans, and Native Americans are underrepresented in the physician workforce.3
- Enrollment rates for Hispanics, Blacks/African Americans, and Native Americans at MD-degree-granting institutions show minimal increases.4

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>% of population</th>
<th>% of physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>15.0</td>
<td>5.2</td>
</tr>
<tr>
<td>White*</td>
<td>65.8</td>
<td>70.2</td>
</tr>
<tr>
<td>Black*</td>
<td>12.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Asian†</td>
<td>4.3</td>
<td>18.1</td>
</tr>
<tr>
<td>Native American†</td>
<td>0.8</td>
<td>0.3</td>
</tr>
<tr>
<td>Other†</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Two or more races*</td>
<td>1.6</td>
<td>1.2</td>
</tr>
</tbody>
</table>

† Includes Native American, Alaska Native, Native Hawaiian, and other Pacific Islander alone.
* Non-Hispanic.

Racial and ethnic diversity in the physician workforce contributes to increased access to care for the underserved and to increased patient satisfaction.5,6

- The Liaison Committee for Medical Education requires all medical schools to “develop programs or partnerships aimed at broadening diversity among qualified applicants for medical school admission.”7
- Since 1988, the Robert Wood Johnson Foundation has supported national pipeline programs to increase diversity in medicine (the Minority Medical Education Program [MMEP] and the Summer Medical Education Program [SMEP]). Dentistry was added in 2005 resulting in the current program, SMDEP.
- Pipeline programs like SMDEP contribute significantly to meeting the nation’s need for physicians by supporting the development of a diverse and well-prepared applicant pool.8,11

SMDEP Program Activities

- Academic enrichment: basic sciences, math
- Career development: clinical shadowing, admissions preparation
- Personal development: study and learning skills, financial planning

Medical School Applicants by Race/Ethnicity, 2002 – 2008

Applicants to MD-Granting Institutions, By Race/Ethnicity and SMEP Participation, 2004

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>% of all applicants</th>
<th>% of SMEP participants</th>
<th>SMEP as % of all applicants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>7.1</td>
<td>23.8</td>
<td>8.2</td>
</tr>
<tr>
<td>White*</td>
<td>59.4</td>
<td>1.5</td>
<td>0.1</td>
</tr>
<tr>
<td>Black*</td>
<td>8.4</td>
<td>59.7</td>
<td>17.6</td>
</tr>
<tr>
<td>Asian†</td>
<td>20.2</td>
<td>8.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Native American†</td>
<td>0.3</td>
<td>1.2</td>
<td>9.8</td>
</tr>
<tr>
<td>Other†</td>
<td>1.5</td>
<td>0.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Two or more races*</td>
<td>3.1</td>
<td>4.4</td>
<td>3.6</td>
</tr>
</tbody>
</table>

* Non-Hispanic.
† Includes Native American, Alaska Native, Native Hawaiian, and other Pacific Islander alone.

10. Association of American Medical Colleges. Summer Medical and Dental Education Program participant data. July 2008. (Program was called SMEP in 2004, prior to addition of dentistry in 2005.)
The Doctor of Pharmacy (PharmD) Degree

Jennifer M. Patton, MLIS, Director of Institutional Research; Lucinda L. Maine, RPh, PhD, Executive Vice President and Chief Executive Officer; Rebecca M. Morgan, MPA, Director of Communications, American Association of Colleges of Pharmacy (AACP)

Accredited Degree Programs in Pharmacy

- Since 2000, the number of colleges and schools of pharmacy has increased nearly 44%.
- Currently, 63 public and 53 private schools of pharmacy are accredited by the Accreditation Council for Pharmacy Education (ACPE).

The Transition to the PharmD

- The baccalaureate in pharmacy (BS Pharmacy) degree was the primary pharmacy degree conferred through the mid-1990s; however, this began to change rapidly with the implementation of the new ACPE standards and guidelines, “Standards 2000.”
- June 2005 marked the official expiration of the BS Pharmacy degree programs.
- The movement to doctoral-level education reflected the need for pharmacists to assume new roles and improved medication-therapy-management services for increasingly complex conditions.
- Over the past five years, in response to the shortage of pharmacists in the United States, the number of PharmD degrees conferred has increased more than 28% through the expansion of existing programs and the establishment of new schools.

The PharmD Education Continuum

- The PharmD curriculum is structured to create, over the course of the professional program, self-directed, lifelong learners.
- The current standards require a minimum of two years of preprofessional education.
- 65% of students matriculating into the professional degree program have completed three or more years of post-secondary education.
- 43% of these students hold a baccalaureate or higher degree.

For more information on the Doctor of Pharmacy degree, visit www.aacp.org.

As the nation’s medical schools continue to expand enrollment to meet the growing health care needs of our nation, understanding the practice characteristics of racial and ethnic minority physicians will help inform diversity-building efforts within the physician workforce. Moreover, a number of reports provide evidence of the need for diversity in the physician workforce to serve the growing multicultural and diverse population in the United States.1-3


Data source: AAMC Minority Physician Database: 1950–1978 data were compiled from the AAMC’s medical school profiles; 1979–2007 data were from the AAMC Data Warehouse Student file; all data were then matched to the AMA Physician Masterfile.

By 2007, an overwhelming majority of racial and ethnic minority physicians (86.7%) were engaged in patient care.

- 68.4% of patient-care physicians were in office-based practice.
- Less than 2% of racial and ethnic minority physicians reported conducting research or teaching.

More than 81% of Black and American Indian/Alaska Native physicians practiced in 10 specialties.

- About 77% of Hispanic/Latino physicians and 74% of Asian physicians practiced in 10 specialties.

Internal medicine and/or family/general practice were listed as top specialties for these four racial and ethnic groups.

By 2007, more than half of all Black, American Indian/Alaska Native, and Hispanic/Latino physicians practiced in primary care specialties (i.e., family medicine, general practice, internal medicine, obstetrics–gynecology, and pediatrics).
AM Last Page: Truths About the Rural Physician Supply

Howard K. Rabinowitz, MD, Ellen M. and Dale W. Garber Professor of Family Medicine and director, Physician Shortage Area Program, Jefferson Medical College of Thomas Jefferson University

Rural areas lack an adequate supply of physicians, including primary care physicians (PCPs; i.e., family physicians, general internists, and general pediatricians) compared with non-rural areas. However, people living in rural areas have more medical need, being sicker, older, and poorer than those in non-rural areas. While 20% of the U.S. population lives in rural areas, only 9% of physicians practice there. Non-metropolitan areas have 59 PCPs / 100,000 population vs. 94 PCPs / 100,000 population in metropolitan areas.

Comprehensive medical school rural programs (MSRPs) are among the most successful ways to increase the rural physician supply.

Admissions policies are critical in increasing the supply of rural physicians.

- Among the myriad of factors related to practicing rural primary care, two known at the time of matriculation to medical school – having a rural background and specialty plans for family medicine – are the most powerful predictors with the strongest supporting evidence.
- While 20% of the U.S. population lives in rural areas, only 9% of physicians practice there. Non-metropolitan areas have 59 PCPs / 100,000 population vs. 94 PCPs / 100,000 population in metropolitan areas.

Rural physicians have higher incomes than non-rural physicians when income is adjusted for specialty and cost of living.

While all urban physicians on average have higher incomes than all rural physicians, much of this disparity is due to the different distribution of PCPs versus non-PCP specialists in these areas. When adjusted for specialty and for the lower cost of living in rural areas, average rural physician incomes are actually significantly higher than those of physicians in urban areas (See figure). Rural physicians work an average of 2 hours more per week than urban physicians; however, most urban physicians spend more than 2 additional hours weekly commuting to work than do rural physicians.


The federal government’s investment to support the missions of medical schools and teaching hospitals is a small but essential part of the federal budget that has undergone increasing scrutiny during the ongoing deficit reduction discussions in Washington, DC. The following graphics describe funding through the National Institutes of Health (NIH) for medical research, funding through Medicare for both graduate medical education and the specialized services that teaching hospitals provide, and the relationship of these programs (NIH and Medicare) to the overall federal budget.

Federal Spending – 2012
- The Congressional Budget Office (CBO) estimates that in fiscal year (FY) 2012, which began on October 1, 2011, the federal government will spend $3.6 trillion.
- The federal budget has more than doubled in size since 2000.
- Social Security, Medicare, and Medicaid account for 44% of the federal budget, totaling nearly $1.6 trillion.
- Roughly 36% of the budget is discretionary spending (in green), which is determined by Congress through the annual appropriations process. In FY 2012, discretionary spending will total $1.3 trillion.
- Discretionary spending is determined annually by the House and Senate Appropriations Committees, which are each divided into 12 subcommittees with jurisdiction over specific federal departments and agencies.

Nondefense Discretionary Spending – 2012
- Discretionary spending is often further divided between defense and nondefense spending, which includes funding for programs ranging from the Department of Agriculture and the Department of Education to the National Science Foundation and National Aeronautics and Space Administration. For this reason, nondefense discretionary spending is often called “domestic” spending.
- The Labor, Health and Human Services (HHS), and Education (ED), and Related Agencies Subcommittee is the largest of the domestic funding subcommittees, accounting for nearly 30% of nondefense spending.
- One out of every five dollars in the Labor-HHS bill goes to the NIH, which received $30.6 billion in FY 2012.

Mandatory Spending – 2012
- Mandatory spending is funding for programs covered by federal laws other than appropriations. Mandatory spending includes entitlement programs, which by law require the federal government to make payments to individuals (or state or local governments) that meet the legal criteria for eligibility.
- Examples of mandatory spending programs other than Medicare include Social Security, Medicaid, unemployment compensation, and federal civilian and military retirement.
- One out of every four mandatory spending dollars goes to Medicare.
- The CBO estimates that support for teaching hospitals through direct and indirect medical education payments will total $9.1 billion in 2012, less than 2% of Medicare’s overall budget.

Social Security, Medicare, and Medicaid Continue to Consume More of the Federal Budget
Twenty years ago, Social Security, Medicare, and Medicaid represented less than one-third of the federal budget. Today, they account for 44% of all federal spending. Further, the CBO projects by 2022, 54 cents out of every dollar the federal government spends will go to these three programs.

In March 2012, the CBO estimated that the federal budget deficit for the fiscal year ending on September 30, 2012, would be $1.2 trillion. The CBO noted that while the deficit is starting to shrink, it remains very large by historical standards. Concerns about the federal budget deficit and the ability of the federal government to identify and support national priorities will likely be key issues during the fall election campaigns. Regardless of who wins in November, the President and Congress will face daunting challenges as they attempt to secure the sustainability of the nation’s fiscal future. The future role of the federal government in supporting critical national priorities such as medical research and graduate medical education may well be determined by the success of those efforts.

Note: All data are from the Congressional Budget Office, The Budget and Economic Outlook: Fiscal Years 2012-2022, January 31, 2012.

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AM Last Page: Medical Students’ Plans at Graduation and Their Relationship with Actual Practice

Karen C. Jones, MApStat, Clese E. Erikson, MPAff, Scott A. Shipman, MD, MPH, Association of American Medical Colleges (AAMC)

There is growing concern about whether the United States will produce enough physicians to address the country’s future workforce needs, particularly in primary care (PC), underserved areas, and academic medicine.*

- Expanding health insurance coverage and the changing health care marketplace are anticipated to significantly increase demand for PC providers.1
- In 2009, over 65 million people were located in federally designated Primary Care Health Professional Shortage Areas.1
- The number of unfilled vacancies in medical faculty positions is growing2 and likely to increase further as several new medical schools have recently opened or are slated to open.

Trends in medical students’ career plans at graduation are not likely to solve all these workforce concerns.

Medical students’ plans at graduation provide insight into future practice.

2001–2004 Graduates’ Preference on the GQ and Their Actual Practice in 2011

Practice characteristics were examined for 2001–2004 graduates (n = 62,831) who responded to the AAMC Graduation Questionnaire (GQ) (n = 53,077). Full-time faculty status was obtained from the AAMC Faculty Roster, other outcomes are from the American Medical Association Physician Masterfile (12/31/2011).

While many factors influence career choice, medical schools can help shape students’ career plans and the future workforce.

- Many medical schools have actively undertaken efforts to increase the numbers of graduates who will pursue a practice in PC, and/or serve in underserved areas.3,4
- Older students, female students, and students from minority backgrounds are more likely to enter PC and/or serve the underserved.5,6
- Students with rural backgrounds are more likely to practice in rural areas.7
- Holistic review processes provide tools for aligning admission policies with educational missions.8
- Students who attend schools where they are more likely to be exposed to positive experiences during their PC clerkships are more likely to pursue a career in PC.9

References:

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