Commonwealth of Massachusetts
Executive Office of Health and Human Services

Report of the Special Commission on Graduate Medical Education

July 30, 2013

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1. Executive Summary

Graduate Medical Education is a critically important part of the health care landscape in Massachusetts. With only 2% of the U.S. population but 5% of U.S. medical trainees, the Commonwealth boasts world-renowned medical training programs and provides training to a disproportionate share of physicians in the United States. Trainees from the Commonwealth move on to leadership careers across the world. Recognizing the important role played by Graduate Medical Education in the Commonwealth, the Commonwealth's recent comprehensive health care cost containment law, Chapter 224 of the Acts of 2012, established a special commission to "examine the economic, social and educational value of graduate medical education in the Commonwealth and to recommend a fair and sustainable model for the future funding of graduate medical education in the Commonwealth."

This Commission was convened by the Secretary of Health and Human Services, who served as chair. The Commission met between February and July of 2013, and examined many aspects of Graduate Medical Education in the Commonwealth. The Commission's work included review of existing funding sources, considering the impact of changes to the delivery system, analyzing the adequacy of funding sources, and examining approaches used by other states. The Commission's meetings and work addressed the following topics:

Medicare is the largest source of GME funding in the United States, accounting for $9.5 billion in funding annually. Medicare funding is provided through two types of payments: Indirect Graduate Medical Education payments and Direct Graduate Medical Education payments. These payments are distributed through formulas that are not tied to actual costs incurred by programs or to performance measures.

In 2012, Massachusetts received $568 million in Medicare GME payments. Other federal funding sources include Medicaid, the Children's Hospital GME program, the Teaching Health Center GME program, the Title VII Health Professions program, the Department of Defense, and the Department of Veterans Affairs.

The work of the Commission occurred at a time of great interest in and pressures on GME at the national level. Nationally, there have been several proposals to reduce GME funding. Furthermore, sequestration resulted in a 2% reduction to Medicare, and the impact of this reduction on GME is yet to be seen. Debt reduction will likely remain a barrier to increasing GME funding.

The impact of delivery system changes and payment reform is particularly relevant in the consideration of the primary care workforce. At baseline, the demand for primary care providers is projected to increase by 8% by 2020, according to one estimate. The supply of primary care providers, including MDs, NPs, and PAs), can also be modeled, though these estimates of supply vary depending on whether training based or practice-based estimates are used. The growth of Patient Centered Medical

Homes and Nurse Managed Medical Homes is expected to shift the MD:NP:PA ratios needed in the provision of primary care. In addition, changes in the delivery system will also impact the number of patients cared for by a physician (panel size), but the net impact is not yet clear. Overall estimates of primary care clinician surpluses or shortages are very sensitive to assumptions about the take-up of new delivery models and projected impact on panel size.

Related initiatives supporting health care workforce development include loan repayment and other programs administered through the Healthcare Workforce Center at the Department of Public Health, and the Healthcare Workforce Transformation Trust Fund led by the Secretary of Labor and Workforce Development. The Innovation Investment program, currently being established by the Health Policy Commission, will be another source of support for innovation in health care and will support health care organizations' development, implementation or evaluation of promising models in health care payment and health care service delivery.

The Commission used several different approaches to understand the adequacy of funding for GME. The Commission estimated that the cost of substituting NPs or PAs for residents' clinical care responsibilities would be $159,000 per trainee per year, though noted that in reality, there would not be adequate numbers of NPs and PAs to fill the gap. The Commission further estimated that program costs (including resident salaries, faculty salaries, and administrative costs) are approximately $114,000 per trainee, with a range of $99,000 to $153,000. Massachusetts received approximately $101,000 per trainee in Medicare funding. Estimates of costs do not capture certain cost categories, including the cost of malpractice, accreditation, travel and educational stipends, and facility costs. The omission of these categories likely underestimates program costs. On the other hand, this analysis did not take into consideration the clinical revenue to the hospital/clinic associated with clinical services attributable to residents, which would underestimate the revenue associated with GME programs. On balance, the Commission acknowledges that there are a wide range of estimates for assessing costs associated with GME programs, and recognizes that the distribution of GME funds may not be optimal.

The Commission finds that GME provides a wide range of benefits to the economy and overall health of the Commonwealth, including providing clinical care to many patients in the Commonwealth, in both the inpatient and outpatient settings that could not otherwise be provided; training the next generation of physicians to meet the medical needs of residents of the Commonwealth; providing valuable teaching services, such as in the education of medical students; promoting innovation in medical care and research; attracting and retaining talented faculty within the Commonwealth; providing highly specialized, cutting-edge care that is not available in non-academic settings; providing care to underserved populations; attracting grant funding; and contributing to the local economy.

The Commission's review of other states' approaches to GME found that in 2012, forty-two states and the District of Columbia provided funding for GME through their Medicaid program. States also use a range of other mechanisms for supporting GME, including cigarette taxes, general fund appropriations, insurer assessments, and other special funds. Some states have established permanent governance bodies to oversee GME activities. States vary as to whether they support non-hospital based training sites, and in the extent that they include support for training of non-physician providers.

Based on its findings, the Commission developed three recommendations relating to GME in the Commonwealth, as follows:

Recommendation 1: In recognition of the important role played by GME in the Commonwealth and in recognition that the current system does not optimally structure GME payments, the Commission supports additional funding for GME that is tied to performance benchmarks. These performance benchmarks should take into consideration factors such as:

- Retention rates of physicians within the Commonwealth;
- Training of physicians in specialties where there are physician shortages (such as those that currently exist in primary care, psychiatry, and general surgery);
- Training of physicians in community health centers, following the model of the Teaching Health Center Graduate Medical Education Program, or other programs sites and geographic areas that will help address physician shortages in those practice settings or areas, particularly those with vulnerable populations, provided that these program sites are affiliated with accredited training programs;
- Quality measures for Graduate Medical Education; and
- Provision of training that supports the goals of payment and delivery system reform and transparency in expenditure of funds.

These performance considerations should apply to existing and additional funding sources. The financing system should encourage a graduate medical education system that is nimble in responding to the needs of the Commonwealth.

Recommendation 2: To enhance the focus on GME in the Commonwealth, the Commission recommends that a specific entity be given clear responsibilities related to Graduate Medical Education. The Commission recommends that these responsibilities be assigned to the Health Care Workforce Center. The Commission further recommends that the Health Care Workforce Center convene an advisory committee on Graduate Medical Education that includes representatives of the organizations included in the Special Commission on Graduate Medical Education.

Responsibilities of the Health Care Workforce Center should include: data collection (as discussed in the next recommendation), communication about the importance of GME; coordination of efforts with the Health Planning Council, the Department of Public Health, EOHHS/MassHealth, the Health Care Workforce Trust Fund Advisory Board, and the Health Policy Commission; coordination with and support to loan forgiveness and other workforce retention initiatives; and oversight over the distribution of additional funding, as described above.

Recommendation 3: The Commission identified a number of areas where additional data related to GME in the Commonwealth could be useful. Data collection should be undertaken by the Health Care Workforce Center and should be coordinated with existing data collection efforts. Data to be collected should include: tracking the number and geographic and specialty distribution of programs in the

Commonwealth; tracking physician workforce, including actual practicing full-time equivalent physicians; tracking program distribution by the demographic mix of the populations served; monitoring the funding received by programs in the Commonwealth for GME as well as related workforce programs; monitoring the retention of trainees, by specialty, geographic region, practice setting, and population demographics; monitoring the quality of GME programs; and monitoring the impact of Massachusetts GME on the Commonwealth and the nation.

The Commission appreciates the opportunity to study and make recommendations on this important topic, and hopes that this report will be useful to legislators, policy makers, and the general public in further advancing the important role Graduate Medical Education in the Commonwealth.

2. Overview of Commission

2.1 Statutory Charge

Section 277 of Chapter 224 of the Acts of 2012 (*An Act Improving the Quality of Health Care and Reducing Costs Through Increased Transparency, Efficiency and Innovation*) created "a special commission to examine the economic, social and educational value of graduate medical education in the Commonwealth and to recommend a fair and sustainable model for the future funding of graduate medical education in the Commonwealth."

Section 277 directed the commission to investigate and report on the following issues:

> (1) The role of residents and medical faculty in the provision of health care in the Commonwealth and throughout the United States;
>
> (2) The relationship of Graduate Medical Education to the state's physician workforce and emerging models of delivery of care;
>
> (3) The current availability and adequacy of all sources of revenue to support Graduate Medical Education and potential additional or alternate sources of funding for Graduate Medical Education. Such review shall include the availability of federal Graduate Medical Education funding to different types of sites where training takes place; and
>
> (4) Approaches taken by other states to fund Graduate Medical Education through, including, but not limited to: (a) Medicaid programs, (b) the establishment of medical education trust funds and (c) efforts to link payments to state policy goals, including:
>
> > (i) Increasing the number of high demand specialties or fellowships;
> >
> > (ii) Enhancing retention of physicians practicing in the Commonwealth;
> >
> > (iii) Promoting practice in medically underserved areas of the state and reducing disparities in health care;
> >
> > (iv) Increasing the primary care workforce;
> >
> > (v) Increasing the behavioral health care workforce; and
> >
> > (vi) Increasing racial and ethnic diversity within the physician workforce.

The Commission is directed to file a report with the clerks of the House of Representatives and the Senate.

2.2 Commission Members

The Special Commission is comprised of 13 members, as outlined in Section 277. The Secretary of Health and Human Services serves as chair, and convened the Commission. The membership of the Commission is shown below.

Commissioner	Affiliation	Statutory Criteria
John Polanowicz, Chair	Secretary, Executive Office of Health and Human Services	Secretary of Health and Human Services
Ned Robinson-Lynch	Director of the Division of Primary Care and Health Access, Department of Public Health	Designee of the Commissioner of Public Health
Kimberly Haddad	Manager of Health Care Policy & Deputy General Counsel, Executive Office of Administration and Finance	Designee of the Secretary of Administration and Finance
Nancy Snyder	President, Commonwealth Corporation	Designee of the Secretary of Labor and Workforce Development
Dr. Kevin Hinchey	Academic Dean, Baystate Medical Center	Representative of the Massachusetts Hospital Association
Dr. Joseph Gravel	Chief Medical Officer, Greater Lawrence Family Health Center	Representative of the Massachusetts League of Community Health Centers
Dr. Joel Katz	Director, Internal Medicine Residency Program, Brigham and Women's Hospital	Representative of the Massachusetts Medical Society
Dr. Vincent Chiang	Associate Professor in Pediatrics, Boston's Children's Hospital/ Harvard Medical School	Representative of one of the Commonwealth's medical schools
Dr. Thomas Moore	Associate Provost, Boston University School of Medicine	Representative of one of the Commonwealth's medical schools
Dr. Henry Klapholz	Dean for Clinical Affairs, Tufts Medical School	Representative of one of the Commonwealth's medical schools
Dr. Deborah DeMarco	Associate Dean of Graduate Medical Education, University of Massachusetts Medical School	Representative of one of the Commonwealth's medical schools
Dr. Jeffrey Kuvin	Associate Chief Medical Officer for Graduate Medical Education, Tufts Medical Center	Representative of the Conference of Boston Teaching Hospitals
Dr. Neil Shah	Resident Physician in Internal Medicine, Cambridge Health Alliance	A resident in training at a Massachusetts hospital

2.3 Organization and Schedule of Work

The Commission was convened in February 2013 and developed a workplan for addressing its statutory charge. In April, the Commission submitted its workplan to the Legislature in anticipation of submitting a final report in July 2013. The Commission met five times, on the following schedule:

February 25th

- Overview of the Special Commission on Graduate Medical Education
- Overview of Graduate Medical Education, including statistics and information about funding sources
- Discussion of work plan

March 29th

** Briefing book distributed (attached in Appendix)*

- The relationship of Graduate Medical Education to the state's physician workforce and emerging models of delivery of care
- Approaches taken by other states regarding GME funding (results of state interviews and research)
- Discussion and approval of work plan

May 13th

- National policy context
- Approaches to understanding the adequacy of revenues for GME and measuring the impact of GME funding
- Discussion of goals for GME in the Commonwealth

June 18th

- State primary care workforce programs
- Development of draft recommendations

July 30th

- Presentation and vote on final report

3. Overview of Graduate Medical Education in the Commonwealth and the United States

3.1 Definition of Graduate Medical Education

Graduate Medical Education (GME) is formal clinical training provided by approved residency and fellowship programs to physicians who have received an MD or DO degree (or a foreign equivalent). It involves a period of training lasting three to seven years in which physicians are directly supervised in their learning as they progressively assume more responsibility for patient care. In the United States, training programs are typically accredited by the Accreditation Council for Graduate Medical Education (ACGME) or approved by the Commission on Osteopathic College Accreditation (COCA); a few, non-accredited programs, particularly in small, technical areas still exist. Teaching hospitals generally serve as the sponsors and main training sites for most residency programs, although training often occurs in other inpatient and ambulatory settings in a variety of community-based settings.[1] University of Massachusetts Medical School is the only medical school in the Commonwealth that is the sponsoring institution for GME programs.

3.2 Residency Training in Massachusetts

Massachusetts has a world-renowned health care system, including a robust GME training system. When compared to its population, Massachusetts provides training to a disproportionate percentage of trainees in the United States.

	United States	Massachusetts	MA as % of U.S.
Population	315 million	6.6 million	2%
Trainees	115,293	5,414	5%
Training Programs	9,022	402	4%

Each year an estimated 16,000 U.S. allopathic medical school seniors and 15,000 graduates of osteopathic, Canadian or foreign medical schools compete for approximately 24,000 residency positions across the country.[2] The National Resident Matching Program (NRMP) compiles data on the matching process. Below is a breakdown of the specialties with the largest number of positions in the National Match in the United States and Massachusetts. Except where indicated otherwise, these residency positions reflect training programs that accept trainees immediately upon graduation from medical school, in the first post-graduate year. For other specialties or subspecialties, training begins after the trainee has already completed a year or more of post-graduate training.

[1] American College of Physicians. Aligning GME Policy with the Nation's Health Care Workforce Needs. 2011. http://www.acponline.org/advocacy/where_we_stand/policy/gme_policy.pdf

[2] Main Residency Match. National Resident Matching Program. Available at: http://www.nrmp.org/res_match/

Specialty [3]	Number of Positions--United States
Internal Medicine	5,277
Family Medicine	2,740
Pediatrics (Categorical)	2,475
Emergency Medicine	1,668
Anesthesiology (PGY-1 and PGY-2)	1,476
Obstetrics – Gynecology	1,240
Surgery (Categorical)	1,146
Psychiatry	1,118
Radiology – Diagnostic (PGY-1 and PGY-2)	1,111
Orthopedic Surgery	682

Specialty [4]	Number of Positions--Massachusetts
Internal Medicine	450
Surgery – General	106
Anesthesiology (PGY-1 and PGY-2)	104
Pediatrics (Categorical)	89
Psychiatry	67
Emergency Medicine	64
Radiology – Diagnostic	62
Family Medicine	45
Neurology	42
Obstetrics – Gynecology	37

Eighteen institutions in the Commonwealth sponsor multiple programs in different specialties, and together account for the vast majority of trainees in the Commonwealth. The distribution of programs and the number of trainees at these programs is shown below.[5]

Hospital	City	Programs	Residents
Brigham and Women's Hospital	Boston	47	933
Mass General Hospital	Boston	53	822
Boston University Medical Center	Boston	43	588
Beth Israel Deaconess Medical Center	Boston	40	566
UMMS	Worcester	52	515
Tufts Medical Center	Boston	45	444
Children's Hospital	Boston	37	368

[3] Results and Data: 2012 Main Residency Match. National Resident Matching Program (April 2012). Available at: http://www.nrmp.org/data/resultsanddata2012.pdf. Accessed on: January 15, 2013.
[4] 2012 NRMP Main Residency Match: Match Rates by Specialty and State. National Resident Matching Program. (April 2012). Available at: http://www.nrmp.org/data/resultsbystate2012.pdf. Accessed on: January 15, 2013.
[5] ACGME Data Resource Book, Academic Year 2011-2012. Accreditation Council for Graduate Medical Education Department of Applications and Data Analysis. 2012.

Baystate Medical Center	Springfield	24	317
St. Elizabeth's Medical Center	Boston	11	151
Lahey Clinic	Burlington	14	130
Cambridge Health Alliance	Cambridge	7	98
St. Vincent Hospital	Worcester	5	97
Berkshire Medical Center	Pittsfield	4	69
Mount Auburn Hospital	Cambridge	2	60
Steward Carney Hospital Inc.	Boston	2	51
Mass Eye and Ear	Boston	5	48
Metrowest Medical Center – Framingham Union Hospital	Framingham	2	37
Spaulding Rehabilitation Hospital	Boston	3	21

3.3 Overview of GME Funding Sources

In general, GME is funded through federal programs, state programs and private sources. The Medicare program is the largest funder of GME in the United States. In addition to Medicare funding, the federal government supports GME through other programs, such as the Children's Hospital GME Program, the Teaching Health Center GME Program, the Title VII Health Professions Program, the Department of Defense, and the Department of Veterans Affairs. Non-government funding often comes from industry, non-government grants, physicians' organizations, and in some cases, foreign governments.

Medicare

Medicare is the largest source of GME funding in the United States. In total, Medicare accounts for roughly $9.5 billion in funding annually. Medicare funding is provided through two types of payments: Indirect Graduate Medical Education Payments (IME) and Direct Graduate Medical Education Payments (DME).

DME Funding in the United States

Direct Graduate Medical Education Payments (DME) accounted for roughly $3.2 billion in national funding in FY2011. These payments are intended to compensate institutions for Medicare's share of the direct costs of graduate medical education. Examples of direct costs could include the stipends and benefits for residents, salaries for faculty, and institutional overhead related to GME.

Medicare pays each teaching hospital a portion of the "per resident amount" (PRA).[6] The PRA is the cost incurred by a hospital in a base year divided by the number of residents that hospital employed in that year, updated annually for inflation. Medicare determines its share of the PRA by calculating the number of Medicare inpatient days by the total inpatient days for all patients at each hospital.

[6] "Medicare Direct Graduate Medical Education (DGME) Payments" Association of American Medical Colleges. Available at: https://www.aamc.org/advocacy/gme/71152/gme_gme0001.html.

Each hospital generally has two PRAs; this is due to Medicare only updating its primary care resident PRA for inflation in 1994 and 1995. As a result, teaching hospitals receive a slightly higher payment for primary care resident training.

IME Funding in the United States

In addition to DME payments, Medicare makes Indirect Medical Education (IME) payments to teaching hospitals in recognition of the higher costs incurred by teaching hospitals. While the DME payment is intended to compensate the direct costs associated with teaching residents, such as the salaries of faculty and residents, IME is intended to compensate for indirect costs. These indirect costs reflect the higher costs associated with teaching, involvement of residents in patient care, and the severity of illness of patients who require the specialized services that are available in teaching hospitals. In FY 2011, Medicare IME payments were approximately $6.5 billion nationally.

The IME payment is applied as an adjustment to hospital payments. Medicare utilizes a formula to determine the IME adjustment factor.[7] The formula is:

$$IME\ Adjustment\ Factor = c^* [(1+r)^{0.405} - 1]$$

In the above formula

(r) is the ratio of interns and residents to beds

(c) is a multiplier set by Congress

Overall, the formula translates into a 5.5 percent increase in IME payment for every 10 percent increase in the resident-to-bed ratio.

Medicare GME Residency Caps

In 1997, the Balanced Budget Act set a cap for the number of residents a hospital can claim for its reimbursements under Medicare. These caps were readjusted in 2002 and 2005 on the basis of a national redistribution formula. Nearly all Massachusetts hospitals are at or over their cap. Hospitals can choose to create more slots beyond the cap but Medicare does not help fund them.

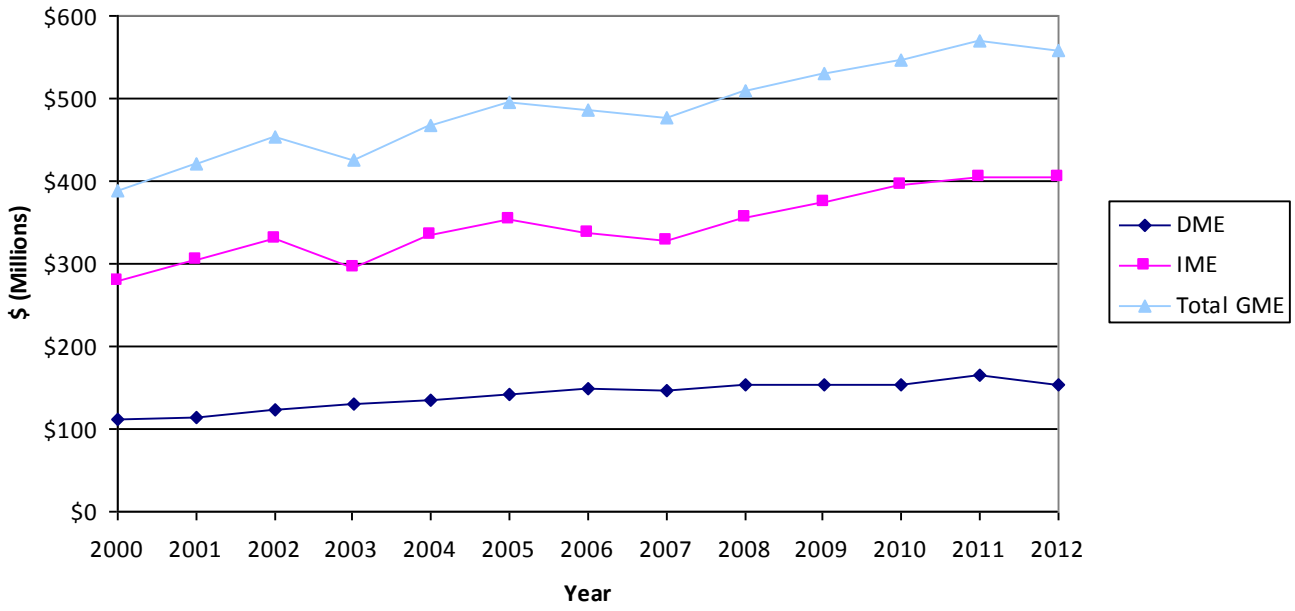
DME and IME Payments in Massachusetts

Academic medical institutions in Massachusetts receive both DME and IME payments. In Massachusetts, IME payments have risen over the past decade from roughly $278 million in 2000 to $404 million in 2012. DME payments have also risen over this time from $111 million in 2000 to $164 million in 2012.

[7] 42 C.F.R. §412.105 (2012)

Total IME and DME funding for Massachusetts is shown in the figure below.[8]

Massachusetts IME, DME and Total GME Funding from 2000-2012[9]



Massachusetts hospitals receiving DME and IME payments, and the amounts received by each, are shown in the table below. According to the 2012 CMS Cost Reports, 27 Massachusetts hospitals received IME payments and 33 hospitals received DME payments through Medicare in FY2012.[10]

Hospital	City	DME	IME	Total
Massachusetts General Hospital	Boston	$27,160,508	$65,758,131	$92,918,639
Beth Israel Deaconess Medical Center	Boston	$23,049,458	$52,121,312	$75,170,770
Brigham and Women's Hospital	Boston	$15,753,282	$57,075,635	$72,828,917
UMass Memorial Medical Center	Worcester	$13,433,041	$52,531,201	$65,964,242
Baystate Medical Center	Springfield	$14,545,752	$30,418,726	$44,964,478
Boston Medical Center	Boston	$13,276,828	$31,211,293	$44,488,121

[8] "Graduate Medical Education for Teaching Hospitals in Fiscal Years 2000-2010". Robert Graham Center. November 2012. Available at: http://www.graham-center.org/online/graham/home/tools-resources/data-tables/dt001-gme-2007.html. Accessed on: June 1, 2013. "Hospital 2522-10 Cost Report Data Files". Center for Medicare & Medicaid Services. Available at: http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/CostReports/Hospital-2010-form.html. Accessed on June 1, 2013. The chart shows the annual payments received statewide utilizing data compiled by the Robert Graham Center and the CMS Annual Cost Reports.

[9] Total GME payments equal the sum of DME and IME payments.

[10] "Hospital 2522-10 Cost Report Data Files." Center for Medicare & Medicaid Services. Available at: http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/CostReports/Hospital-2010-form.html. Accessed on June 1, 2013.

Tufts Medical Center	Boston	$8,650,659	$30,263,363	$38,914,022
Lahey Clinic	Burlington	$7,391,586	$24,930,115	$32,321,701
Steward – St. Elizabeth's Medical Center	Boston	$6,547,300	$15,704,913	$22,252,213
Berkshire Medical Center	Pittsfield	$4,796,965	$9,158,363	$13,955,328
Mount Auburn Hospital	Cambridge	$3,561,162	$9,076,147	$12,637,309
Newton Wellesley Hospital	Newton	$1,983,195	$4,075,850	$6,059,045
Steward Carney Hospital	Boston	$2,801,755	$3,215,503	$6,017,258
North Shore Medical Center	Salem	$1,572,974	$3,560,755	$5,133,729
Faulkner Hospital	Boston	$1,543,495	$2,348,389	$3,891,884
Lawrence General Hospital	Lawrence	$1,357,029	$2,015,910	$3,372,939
Mass Eye & Ear Infirmary	Boston	$1,365,874	$1,759,552	$3,125,426
Brockton Hospital Inc.	Brockton	$998,758	$1,910,946	$2,909,704
Milford Regional Medical Center Inc.	Milford	$712,167	$1,885,529	$2,597,696
New England Baptist Hospital	Boston	$245,812	$1,525,100	$1,770,912
Health Alliance	Leominster	$443,924	$1,276,594	$1,720,518
Good Samaritan Hospital	Brockton	$295,980	$953,514	$1,249,494
Steward – St. Anne's Hospital	Fall River	$274,126	$529,666	$803,792
Cape Cod Hospital	Hyannis	$174,696	$561,626	$736,322
Dana Farber Cancer Institute	Boston	$448,871		$448,871
Winchester Hospital	Winchester	$93,155	$250,018	$343,173
Hallmark Health System	Medford	$78,918	$119,342	$198,260
Children's Hospital Corporation	Boston	$96,559		$96,559
McLean Hospital	Belmont	$88,559		$88,559
Spaulding Rehabilitation Hospital	Boston	$49,919		$49,919
Beth Israel Deaconess Hospital – Needham	Needham		$40,037	$40,037
Marlborough Hospital	Marlborough	$1,173		$1,173
New England Sinai Hospital	Stoughton	$1,158		$1,158

Medicaid Funding

Many states elect to provide funding for GME through Medicaid. In 2009, approximately $3.8 billion was provided through Medicaid to support GME. Medicaid payments can support direct graduate medical education (DME), indirect medical education (IME), and other special services related to teaching hospitals. While Massachusetts in the past has paid DME as part of fee-for-service (FFS) rates, DME payments through Medicaid were eliminated starting in Rate Year 2010.

Children's Hospital GME Payment Program

The Children's Hospital GME Payment Program provides federal funds to freestanding children's hospitals. According to the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services, 55 children's hospitals participate in the program.

The HRSA makes both DME and IME payments under this program to eligible hospitals using a statutory formula. A hospital is eligible for the program if it:[11]

- Participates in an approved GME program
- Has a Medicare Provider Agreement
- Is excluded from the Medicare Inpatient Prospective Payment System (IPPS) under Section 1886(d)(1)(B)(iii) of the Social Security Act, and its accompanying regulations
- Operates as a "freestanding" children's teaching hospital

In FY 2011, roughly $253 million was distributed to children's hospitals. Two Massachusetts hospitals received funds: Children's Hospital in Boston received nearly $18 million and the Franciscan Hospital for Children in Brighton received just under $200,000.[12]

Teaching Health Center GME Program (THCGME)[13]

The THCGME program is a $230 million five-year initiative that began in 2011 to support an increased number of primary care residents and dentists training in community-based ambulatory care settings. Eligible entities include community-based ambulatory patient care centers that operate a primary care medical or dental (general or pediatric) residency program.

The program supports GME through DME and IME payments. The DME payment mechanism is established in the Affordable Care Act. The IME formula is determined by the U.S. Secretary of Health and Human Services. Funding is intended to support only the costs of new residents being trained in a Teaching Health Center (THC). This could include residents in a new THC training program, or an expansion of a training program in an existing THC program.[14]

The Greater Lawrence Family Health Center is the only Massachusetts THC that has received funding under this program. In FY2011, the Center received $150,000 through this program. The Center has received $675,000 each year in FY2012 and FY2013.

[11] "Children's Hospitals Graduate Medical Education Payment Program." Health Resources and Services Administration, United States Department of Health and Human Services. Available at: http://bhpr.hrsa.gov/childrenshospitalgme/index.html.

[12] "CHGME Distributed Payments FY2011." Health Resources and Services Administration, United States Department of Health and Human Services. Available at: http://bhpr.hrsa.gov/childrenshospitalgme/pdf/paymentdata2011.pdf. Accessed on June 1 2013.

[13] Authorized by section 340H of the Public Health Service Act (PHS), as added by Section 5508 of the Affordable Care Act of 2010 (P. L. 111-148).

[14] "Teaching Health Center Graduate Medical Education Program" Health Resources and Services Administration, U.S. Department of Health and Human Services. Available at: http://bhpr.hrsa.gov/grants/teachinghealthcenters/thcgme2011.pdf

Other Funding Sources

Other sources of funding are more limited in scope and scale. The Department of Veterans Affairs supports about 9,000 residents, while the Department of Defense educates and trains about 3,000 residents. The Title VII Health Professions Program provided $39 million in funding in 2012 to support primary care. At the state level, the Massachusetts Department of Mental Health provides approximately $4.5 million per year to seven Massachusetts medical schools or hospitals affiliated with medical schools to support a portion of the salary of a limited number of psychiatry residents and Ph.D. psychology students completing their clinical internship (approximately 50 residents and 15 Ph.D. psychology interns).

3.4 National Policy Context

The work of the Commission is occurring at a time of great interest in and pressures on Graduate Medical Education at the national level. In June 2010, the Medicare Payment Advisory Commission (MedPAC) recommended decreasing IME payments from 5.5% to 2.5%. MedPAC recommended using savings resulting from this change to create performance-based educational incentives.[15] In December of 2010, the plan issued by Erskine Bowles and Alan Simpson as co-chairs of President Obama's National Commission on Fiscal Responsibility and Reform recommended the same reduction in IME payment, but proposed funneling the resulting savings into Medicare.[16] These proposals have not been implemented.

In June 2012, the Institute of Medicine (IOM) was commissioned to review Graduate Medical Education in the United States, with an emphasis on increasing the capacity of the clinical workforce, and reviewing current financing and governance.[17] The IOM is expected to issue a report in December 2013.

In the meantime, as a result of sequestration, Medicare has been subject to a 2% funding cut. While the formula for how this cut would be applied to GME specifically is unclear, a 2% reduction in funding for GME to Massachusetts at FY2010 funding levels would translate into an annual reduction of $10.9 million.

At the federal level, there are legislative proposals that would expand or change Graduate Medical Education funding. For example, H.R 1201/S. 577, sponsored by Representatives Aaron Schock (R-IL)

[15] "Aligning Incentives in Medicare" Medicare Payment Advisory Committee. June 2010. Available at: http://www.medpac.gov/documents/Jun10_EntireReport.pdf. Accessed on June 27, 2013.
[16] The National Commission on Fiscal Responsibility and Reform. The Moment of Truth. Washington DC: The White House, 2010. Available at: http://www.fiscalcommission.gov/sites/fiscalcommission.gov/files/documents/TheMomentofTruth12_1_2010.pdf. Accessed on: June 27, 2013.
[17] Committee on Governance and Financing of Graduate Medical Education. Institute of Medicine. http://www.iom.edu/Activities/Workforce/GMEGovFinance.aspx

and Allyson Schwartz (D-PA), and Senators Bill Nelson (D-FL) and Charles Schumer (D-NY) would increase GME funding over 5 years to support 15,000 physicians at an estimated cost of approximately $1 billion. H.R. 487, sponsored by Representatives Cathy Rodgers (R-WA) and Mike Thompson (D-CA), would authorize HHS to conduct a 5-year GME innovation pilot for primary care funding. Passage of either of these proposals is unlikely.

Overall, the key developments affecting Graduate Medical Education at the national level at this time are budgetary. Additional information will be needed to determine exactly how sequestration cuts will affect GME. In the meantime, the President's FY 2014 budget proposed a 10% cut to IME funding, less than that proposed by MedPAC or Simpson-Bowles. This proposal would decrease funding by $10 billion over 10 years. It is not yet clear what the fate of Graduate Medical Education will be in the final budget, but debt reduction will likely remain a barrier to increasing GME funding.

In addition to this being an unstable time for Graduate Medical Education budgets, the accreditation portion of Graduate Medical Education is also in the midst of major changes. The Accreditation Council for Graduate Medical Education (ACGME), the primary accreditation body for GME in the United States, is in the process of rolling out their "Next Accreditation System." This new paradigm will shift the focus on educational training programs more towards issues such as duty hour mandates, competency-based curriculum and evaluations, milestones, supervision, and outcomes. This new system will undoubtedly improve the accreditation process, but will take time, effort and funding to be successful.

4. Relationship of Graduate Medical Education to the state's physician workforce and emerging models of delivery of care

In 2012, there were approximately 35,000 licensed physicians in the Commonwealth.[18] The Commonwealth's Graduate Medical Education programs play an important role in developing the state's physician workforce. Approximately 45% of graduates from Massachusetts' GME programs remain in the state. Residents contribute to undergraduate medical education as well, as teachers and supervisors of medical students. Finally, the academic environment fostered by the presence of GME programs facilitates the recruitment and retention of talented faculty.

At the same time, there are new demands on the physician workforce, as well as the medical system as a whole. Specifically, the Commonwealth has implemented policies to encourage a shift away from fee-for-service, and toward alternative payment methodologies that encourage quality and coordination in care.

As a result, it is anticipated that there will be an increase in arrangements such as Accountable Care Organizations and Patient-Centered Medical Homes. To better understand the implications of these shifts, it is important to first understand current estimates of workforce needs. These estimates range from a national shortage of 7,000 primary care physicians (PCPs) in 2020 to a 45,000 PCP shortage in 2020.[19] Both of these models assume that the number of physicians required to care for a population is fixed.

However, the advent of new models of care, notably Patient-Centered Medical Homes (PCMHs) and Nurse Managed Health Centers (NMHCs), could change this key assumption. An analysis presented by Dr. Mark Friedberg and Dr. David Auerbach from the RAND Corporation surveyed the available literature as well as data from Pennsylvania's Chronic Care Initiative for PCMHs. The RAND team has built a model of the potential impact of PCMH and NMHC and workforce assumptions, which allows for analysis using different assumptions of the prevalence of these arrangements as well as of the number of patients care for by a physician associated with such arrangements. At baseline, the analysis assumed that a PCMH uses approximately 10% more NPs and PAs per MD/DO. Overall, the model assumed an increased demand for primary care of 8%, based on demographic trends and on the implementation of the Affordable Care Act. Estimates of primary care clinicians, based on estimates of how many providers practice primary care based on their practice-based patterns (not their training specialty) suggests a national primary care supply of about 130,000 clinicians in 2010 and 140,000 clinicians in 2020, with an MD:NP:PA ratio of 61:26:13 in 2010 and 54:33:13 in 2020.

[18] The number of licensed physicians does not reflect the number of full-time equivalent physicians in practice, as licensed physicians may include physicians who participate in research, administration or other non-clinical activities for part or all of their time.

[19] Kirch, DG, Henderson MK, Dill MJ. Physician Workforce Projections in an Era of Reform. Ann Rev Med. 2012;63:435-445; The Physician Workforce: Projections and Research into Current Issues Affecting Supply and Demand. U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions. December 2008. Available at: http://bhpr.hrsa.gov/healthworkforce/reports/physwfissues.pdf. Accessed on July 3, 2013.

In terms of demand, changes in assumptions about the prevalence of PCMH and NMHC, as well as about the number of patients cared for by a physician with these new models of care, change results about whether there will be a shortage or surplus of certain provider types. Overall, estimates are very sensitive to changes in primary care delivery models and standard projections do not take these changing models of primary care delivery into account. Growth of PCMH and NMHC models would further affect the projected provider imbalances.

Of note, the state's Health Planning Council is studying current and projected supply and demand for primary care services in the Commonwealth as part of the state's health plan, which is due January 1, 2014.

5. Overview of Health Care Workforce Center activities

The Health Care Workforce Center in the Massachusetts Department of Public Health (MDPH) undertakes a range of activities related to Graduate Medical Education, including:

- Health professions data series collection
- The Massachusetts loan repayment program (MLRP)
- Research on health workforce recruitment and retention in high need areas

The Health Care Workforce Center was established in the Acts of 2008 and expanded in Chapter 224 of the Acts of 2012. The mandate for the Health Care Workforce Center is to coordinate MDPH health care workforce activities with state agencies and public and private entities by:

- Monitoring trends in access to health care providers
- Identifying solutions to address health care workforce shortages

Health Professions Data Series

The Health Professions Data Series is the first of its kind data collection which provides for systematic and consistent health professions data collection. Data collection through the electronic licensure process includes the number, type, race/ethnicity, and practice locations of primary care disciplines. This data series characterizes the workforce from a supply perspective, enhancing the ability to identify trends and patterns in the workforce that may impact access to health care professionals and the services they provide. To date, data are being collected from various disciplines including: physicians, nurse practitioners, physician assistants, pharmacists, dentists, dental hygienists, and licensed practical nurses.

This data collection improves our understanding and will result in targeted solutions to planning and cost containment while improving access to primary care. For example:

- Geographic-based planning provides information about the impact of physician (or other provider) density on access to care;
- Demographic-based planning informs projections based on population shifts including age, race/ethnicity, language, disability, retirement, education, and public and private insurance;
- Policy-based planning accounts for local policies and knowledge such as rates of disease, water fluoridation.

The Massachusetts Loan Repayment Program for Health Professionals (MLRP)

Since 1990, state and federal grant funding has supported the MLRP. This program is designed to assist in recruitment and retention by assisting clinicians with school loan repayment in return for a commitment to provide primary care in an underserved area of the Commonwealth for at least two years. Average physician loan amounts are $50,000 for a two-year full time commitment. The program awards approximately 18 health professionals per year. Since 1990 the MLRP has made approximately 325 awards.

The Health Care Workforce Center is able to award loan repayment to providers who do not fit federal shortage area criteria and who do care for Massachusetts-specific-underserved.

Chapter 224 of the Acts of 2012 expands three recruitment and retention programs:

- Health care workforce loan repayment program;
- The primary care residency grant program (new to this legislation);
- Primary care workforce development and loan forgiveness grant program at community health centers (new to this legislation).

The Center will be working with stakeholders to develop and implement these programs.

Summary of Health Care Workforce Center recruitment and retention research

The Health Care Workforce Center has researched health workforce recruitment and retention through literature review, MLRP exit interviews, surveys and interviews with program participants and with health employer human resource or medical directors. These research findings are consistent with other research and indicate that:

- Most sites do not have in place a formal recruitment or retention plan;
- A hospital affiliation increased the recruitment and retention capacity of community based agencies;
- Community based agencies find it difficult to compete with neighboring hospitals' salaries and benefits;
- Access to flexible funding options would likely increase recruitment and retention;.
- It is difficult to use loan repayment as a recruitment tool when it cannot be guaranteed to prospective staff.

Survey results also demonstrated reasons why clinicians stay. These include:

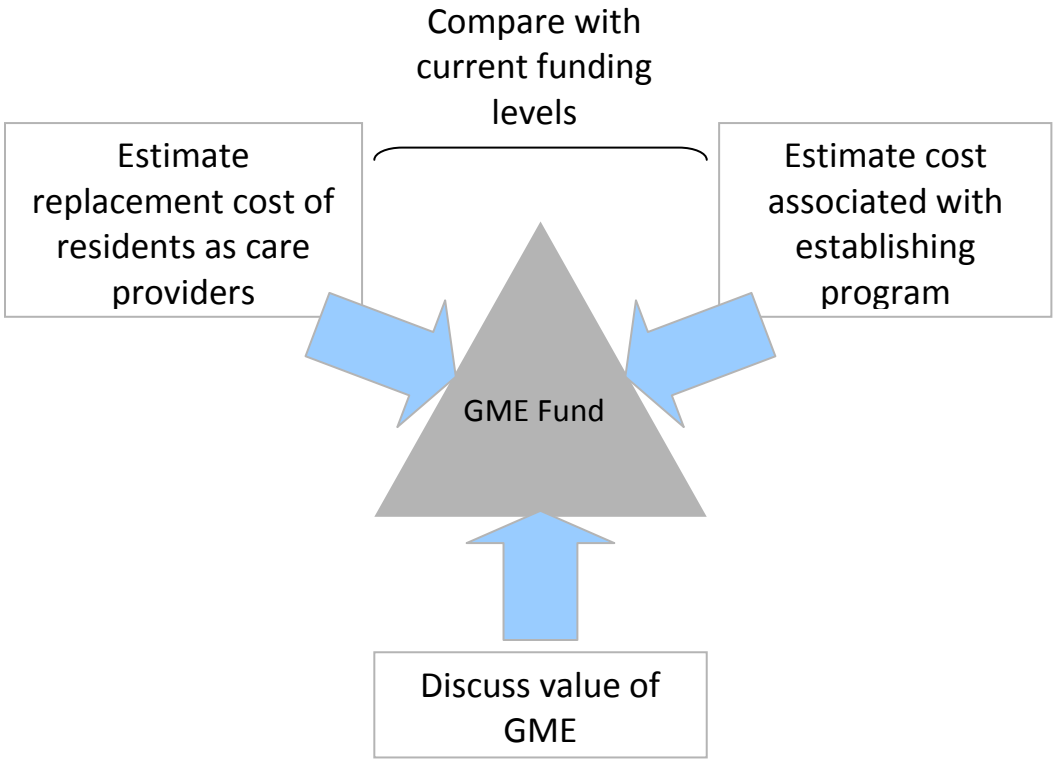
- Relevant and accessible training and learning opportunities;
- Opportunities for career advancement and career paths;

- Orientation to work site systems, colleagues, and patient population.

No one solution will guarantee recruiting or retaining a primary care provider and a variety of options, including loan repayment, J1 Visa Waiver, salary and benefits, and relevant educational opportunities are part of the solution. The Health Care Workforce Center is willing to assist in next steps including planning for the administration of GME, and providing additional research of best practices regarding retention and expansion for access to primary care while at the same time controlling overall costs to the system.

6. Financial analysis of Graduate Medical Education

As part of its work, the Commission examined both the cost and the value associated with Graduate Medical Education. The Commission approached this examination from three perspectives. The first was to estimate the cost associated with replacing the clinical services provided by residents with other providers. The second was to develop an estimate of costs associated with operation of a Graduate Medical Education program. The last was to identify areas in which Graduate Medical Education provides value to the Commonwealth and the nation. By using three different approaches, the Commission acknowledged that there are different ways of thinking about the "true" costs and value associated with GME.



6.1 Estimating costs of replacing residents as care providers

One approach to understanding the financial benefits of GME to the Commonwealth is to approximate the dollar amount associated with the clinical care services provided by residents, by estimating the replacement costs if programs were to substitute residents with mid-level providers.

First, the Commission determined the number of residents in Commonwealth, and separated the number by interns (PGY-1) and residents (PGY 2-8). Second, the Commission estimated the number of clinical hours worked per week by residents. The Commission estimated that interns provide clinical care for 46 weeks per year at an average of 65 hours per week. This assumes that interns receive four

weeks of vacation and two additional weeks during which they may have little or no clinical time at the hospital (this could represent research or elective time, or sick call coverage). The Commission further estimated that residents provide clinical care for weeks per year at 60 hours per week and an additional eight weeks per year at 40 hours per week (representing elective time), and have four weeks of vacation.

Based on these assumptions, the total number of hours of clinical care provided by interns and residents was estimated as follows:

	Number in Massachusetts[20]	Estimated Hours Worked per Year
Interns	1,042	3.1 M
Residents, PGY2-8	4,372	11.9 M
Total	5,414	15.0 M

Second, the Commission estimated the average salaries earned by nurse practitioners and physician assistants in the Commonwealth, as noted below. The Commission estimated a 25% fringe rate for NP and PA salaries. The Commission estimated that nurse practitioners and physicians assistants work 48 weeks per year at 40 hours per week.

	Avg Annual Salary[21]	Salary plus 25% fringe	Hours per week	Weeks per year
NP	$97K	$122K	40	48
PA	$99K	$123K	40	48

Third, the Commission estimated the number of NPs and PAs that would be needed to provide coverage for the hours of clinical care currently provided by interns, residents and fellows. This estimation required assumptions about what percentage of the clinical hours worked by interns, residents or fellows would need to be covered by an NP or PA. The Commission believes that all resident hours should be assumed to be covered 1:1, but that it is reasonable to assume that only half of intern hours would be covered. This is to account for a team structure frequently found in training, where interns are supervised by residents or fellows.

	Total Hours worked	Number of NP-PA replacements needed	Cost of NP-PA replacements
Resident hours plus 50% of intern hours	13.4 M	7,005	$860 M

[20] ACGME Data Resource Book for the 2011-2012 Academic Year and National Resident Matching Program, 2012 NRMP Main Residency Match: Match Rates by Specialty and State (April 2012). Available at: http://www.nrmp.org/data/resultsbystate2012.pdf

[21] Source of salary information: 2012 Medical Office Practice Compensation Survey by Gallagher Surveys

Using this methodology, the total replacement cost associated with clinical care provided by trainees is estimated to be $860 million per year, or an average of $159,000 per resident.

The Commission notes that there are a number of important caveats to consider with regard to this analysis.

The Commission notes that this approach does not take into account other expenses that may be relevant. For example, the Commission notes that the costs associated with covering maternity leave for mid-level providers is not accounted for in this analysis, and that if this cost were accounted for, the overall estimate of replacement cost would increase. The Commission also noted that the analysis presumes that there are adequate numbers of mid-level providers to substitute for residents, which is not the case. Another major limitation is that the analysis assumes that NPs and PAs are able to fill the roles of interns, residents and fellows. This may not be true for all positions; in particular, some of the functions performed by fellows would likely require faculty level replacements, which would further increase the estimated replacement cost.

6.2 Estimating costs of operating a GME program

The second approach taken by the Commission was to examine the different costs associated with operating a GME program. The Commission considered three types of costs: direct costs (resident salaries and fringe), teaching costs (faculty salaries), and program costs (program director salaries and administrative expenses).

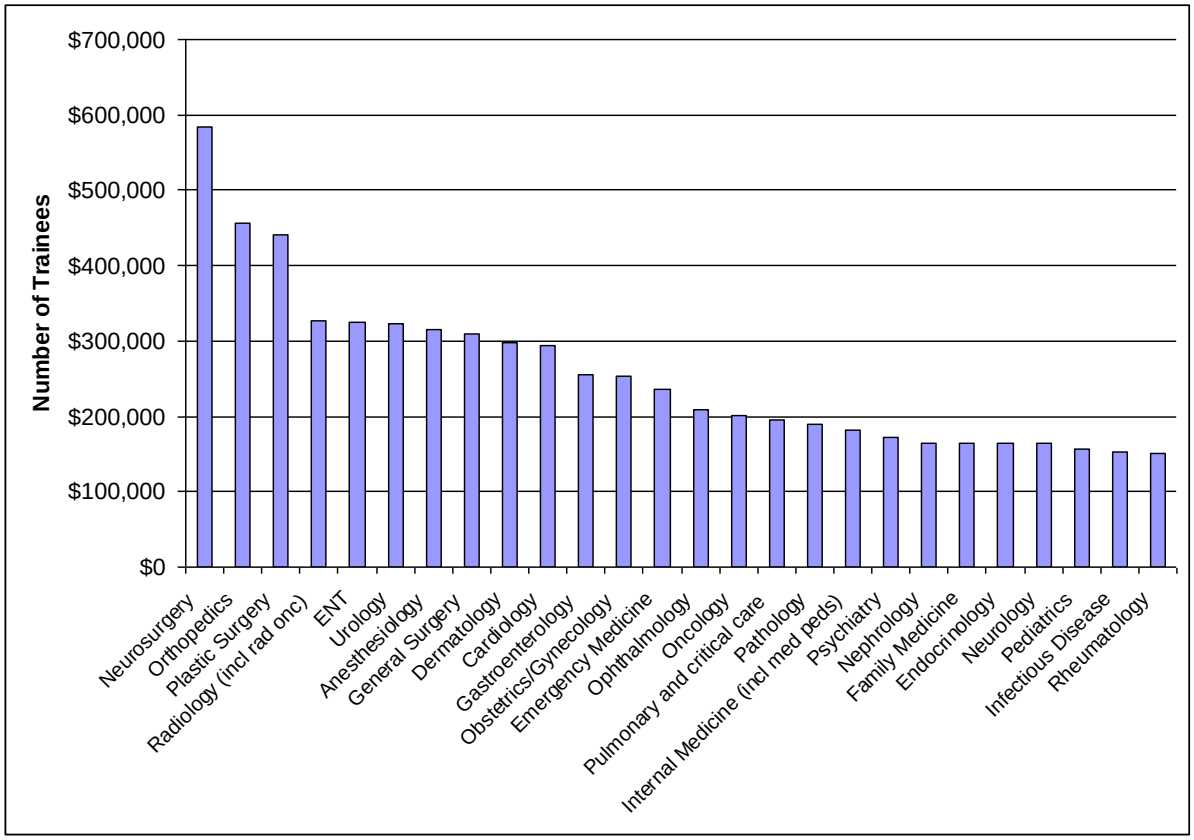
To estimate direct costs, the Commission reviewed 2012-2013 salary data reported by the AAMC Survey of Annual Resident/Fellow Stipends.[22] The Commission compared that reported national salary data with salary information from a number of Massachusetts programs. Based on this analysis, the Commission assumed an average salary of $55,000 per year for post-graduate year (PGY) 1-3 trainees, and an average salary of $59,000 per year for PGY 4-7 trainees. These estimates correspond to the 75th percentile of national salaries reported by the AAMC. The Commission further assumed that fringe was equal to 25% of the total salary. Other costs, such as malpractice, are not accounted for in this total.

Next, the Commission made an estimate of the distribution of residents by specialty. This distribution was used in the calculation of teaching and program costs. The distribution was obtained from 2011 AAMC data, with some smaller categories combined to facilitate analysis (for example, dermatopathology was combined with pathology, and pediatric cardiology with cardiology).[23]

The distribution of trainees by specialty is shown on the next page.

[22] "AAMC Survey of Annual Resident/Fellow Stipends and Benefits". Association of American Medical Colleges. 2012. Available at: https://www.aamc.org/download/312786/data/2012stipendsurveyreportfinal.pdf

[23] Specialty data provided by AAMC's GME Track®



Teaching costs refer to the salary related expenses of faculty who provide teaching to trainees, and are expressed in full-time equivalents. Teaching can take the form of formal didactics (where faculty give lectures or lead discussions with students), or precepting or supervising in clinical settings. To provide an overall estimate of the burden of teaching associated with different specialties, the Commission assumed a faculty-to-trainee ratio of one full-time equivalent faculty to 12, 10, or 6 trainees, based on the expected teaching intensity. The ratios were applied differentially by specialty, with an underlying assumption that teaching intensity was less for medical specialty training for fellows (for example, rheumatology or cardiology), compared with general medical training for residents (internal medicine or pediatrics). The ratios were also predicated on an assumption that in highly procedural specialties (such as surgery, anesthesia, or surgical subspecialties), a large proportion of the teaching occurs during "billable" time, so there is less downward pressure on faculty productivity. Some have noted that training in outpatient settings may both be more expensive (due to higher overhead costs) and have lower clinical reimbursement.

The total number of full-time equivalent faculty needed per specialty was multiplied by the average faculty salary for that specialty, in order to derive the total cost. Faculty salaries by specialty were based on 2010-2011 mean medical school faculty salaries by specialty at the assistant professor level for the northeast region.[24]

[24] Report on Medical School Faculty Salaries 2010-2011. Association of American Medical Colleges. 2012.

The third component of cost relates to program costs, which includes both the cost of a program director as well as the cost of administrative support. To estimate these costs, the Commission estimated the full-time equivalents required for a program director, based on Residency Review Committee requirements when available, and average program size. The FTE for program directors ranged from 0.5 to 2.5. To calculate the total cost, the FTE requirement was multiplied by an estimated program director salary, based on mean medical school faculty salaries by specialty at assistant professor level for the northeast region. For administrative cost, the Commission assumed one FTE administrative position per program, and estimated $80,000 per year for salary and fringe.

Estimates of per-resident costs are shown below, including the average cost, weighted by specialty composition, as well as the range of per resident costs across specialties.

	Salary plus fringe	Teaching costs	Program costs	Total
Per resident cost (range)	$68,750-$73,750	$20,463-$60,760	$4,672-$26,353	**$99,388-$152,809**
Per resident cost (weighted avg)	$69,881	$35,270	$8,786	**$113,937**

It is important to note that the cost estimates are based on the current model of teaching and training, and do not consider whether that model should be changed. In addition, the model does not account for all costs that could be associated with graduate medical education programs. Other costs, not included here, could include educational allowances, travel stipends, facility costs, the costs of malpractice coverage, and the costs of obtaining and maintaining accreditation.

6.3 Comparison to current funding level and other studies

The cost estimates obtained by using the previous two approaches were compared with the total amount of Medicare funding to Massachusetts for GME, on a per capita basis. This comparison is shown below:

	Total	Per Trainee
Estimated replacement cost	$860 M	$159K
Estimated cost of establishing a program	$590 M	$114K ($99-153K)
Total Medicare funding to Massachusetts to GME	$546 M	$101K

It is important to note that the estimates in the first two rows do not account for any reimbursement obtained by the hospital/clinic for clinical services provided by the trainee. In the literature there are some other studies that try to address this issue, though they tend to be specialty specific. For example, a University of Washington Family Medicine Network survey from 2003 found estimated revenue per resident of $79,959 from federal GME payments and $115,576 in mean net patient service revenue, compared to expenses of $274,239.[25]

In addition, the estimates do not account for funding from other funding sources, such as funding for Children's Hospitals, Teaching Health Centers, or the VA.

The Commission reviewed other studies that have estimated costs associated with Graduate Medical Education. The AAMC has estimated a per trainee cost of $100,000 per year,[26] and the Alliance for Academic Internal medicine has estimated a per trainee cost of $130,000 per year.[27] A study of an anesthesiology program for the 1996-1997 academic year found instructional costs of $75,070 per resident and estimated the replacement value of the teaching and clinical services provided by residents to be $103,436 per resident per year above the cost of the resident.[28] A study in Minnesota that used a similar technique of estimating component costs, similar to the approach above in Section 6.2 found a mean cost of $130,843, of which 52% was attributed to faculty costs, 26% to resident costs, and 22% to administration.[29]

Our approach in Section 6.2 did not count for a number of "other" costs of residency, such as educational allowances and stipends. A recent study attempted to quantify these "other" costs and found an estimate of $4,439 per resident, though with a sizable range of $1,500 to $9,417.[30]

Overall, the estimates prepared for and reviewed by the Commission were in the range of previous studies, though there is a wide range of estimates depending on what costs and/or revenues are considered.

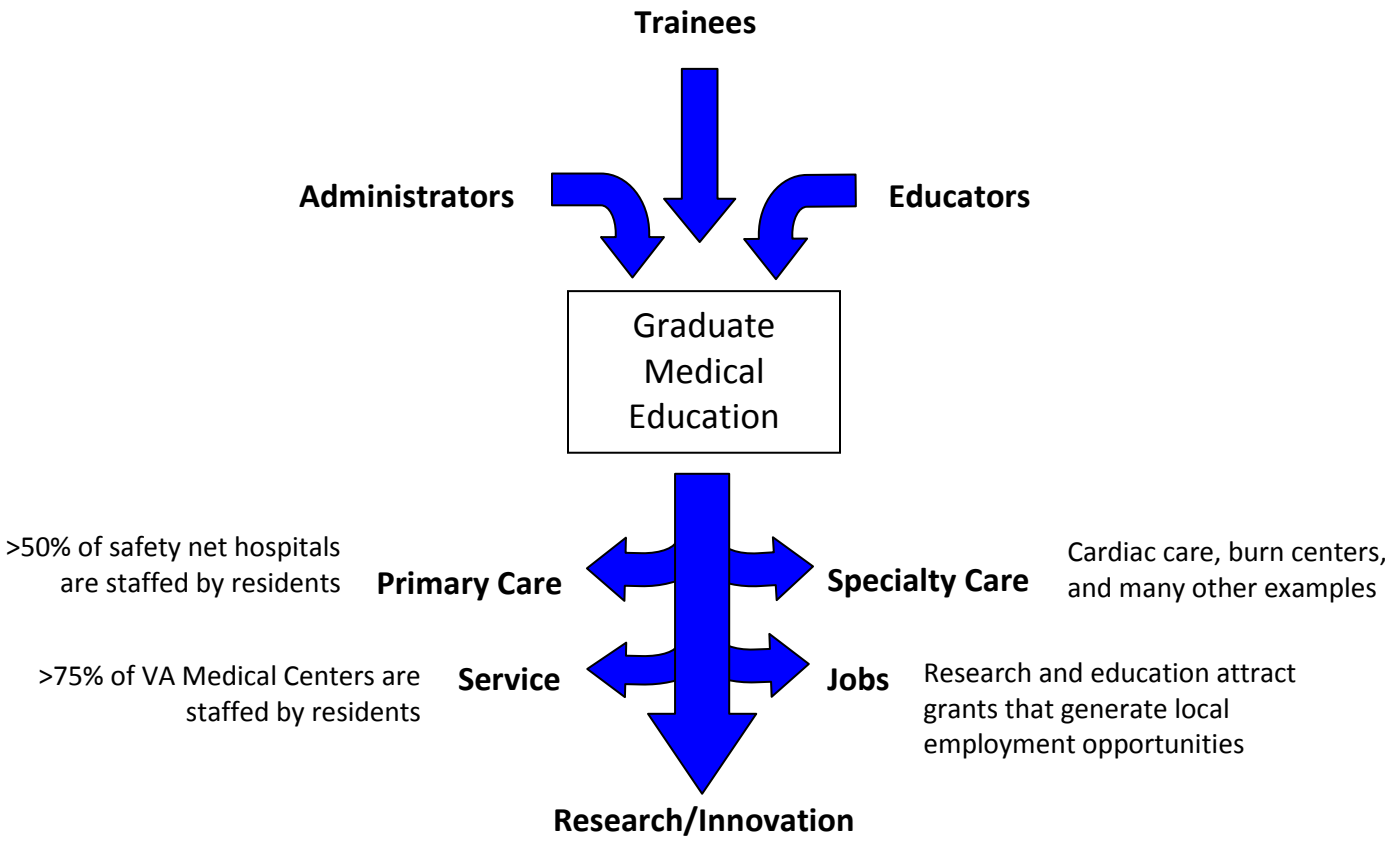
6.4 Discussion of broader value of GME

In addition to developing cost estimates, the Commission discussed the value of GME and its impact on many sectors in the Commonwealth. The Commission noted the role of academic medical centers in

[25] Pauwels J, Oliveira A. Three-year trends in the costs of residency training in family medicine. Fam Med. 2006;38(6)408-415.
[26] https://www.aamc.org/download/335878/data/gmeone-pager.pdf
[27] Steinmann AF. Threats to graduate medical education funding and the need for a rational approach: a statement from the Alliance for Academic Internal Medicine. Ann Intern Med. 2011;155: 461- 464
[28] Franzini L, Berry JM. A cost-construction model to assess the total cost of an anesthesiology residency program. Anesthesiology. 1999;90(1): 257-268.
[29] Blewett LA, Smith MA, Caldis TF. Measuring the direct costs of graduate medical education training in Minnesota." Academic Medicine. 2001;76(5):446-452.
[30] Kelly SP, Tibbles C, Barnett SR, Schwartzstein RM. The "Hidden Costs" of Graduate Medical Education in the United States. J Grad Med Educ. 2012;4(2):267-268.

providing specialty care and in promoting research and innovation. GME supports cutting-edge care and scientific and clinical advances. Additionally, the academic environment plays an important role in recruiting and retaining faculty. Trainees also play an important role in teaching, particularly of medical students. Academic medical centers play a role in providing care of underserved patients. Graduate Medical Education also contributes to the significant federal grant funding resources that Massachusetts institutions are able to attract. In FY2012, Massachusetts organizations received over $2.5 billion in NIH grants, supporting nearly 34,000 jobs.

The existence of residency programs also has a positive impact of the local economy, by bringing in trainees and staff to the local area, many of whom settle in the Commonwealth permanently.



While many of these impacts are difficult to quantify, they are important factors to recognize in reviewing the importance of Graduate Medical Education in the Commonwealth.

7. Approaches taken by other states

To better understand different states' approaches to GME, the Commission reviewed the Association of American Medical Colleges' (AAMC) 50-state survey.[31] This survey asks states to report on the types of GME funding provided, through Medicaid or other programs. The Commission reviewed the report to gauge Medicaid GME spending around the nation.

In 2012, forty-two states and the District of Columbia provided funding for GME through their Medicaid program. Of these, forty states and the District of Columbia fund GME under their fee-for-service programs with twelve states using payment calculation methods similar to Medicare. The remaining twenty-eight states (and the District of Columbia) use methods that differ from Medicare. Examples of the different methods employed by states include a per-resident method based on the teaching hospital's share of total Medicaid revenues, costs or volume (six states) a modified Medicare methodology (three states) and a lump sum amount (three states). An additional three states make their payments to teaching hospitals using a state subsidy approved through state appropriations.

Teaching hospitals are the primary training institution for most states. Four states stated that they provided Medicaid funding to non-hospital based teaching sites (Kansas, Minnesota, Mississippi, and Virginia). Three states give Medicaid funding to medical schools as well (Oklahoma, Tennessee, and Minnesota). Twelve states allow or require funding for non-physician trainees, including nine that explicitly included graduate nursing programs.

To better understand states' approaches to GME, staff from the Executive Office of Health and Human services conducted phone interviews with staff from several states. Five states were chosen for interviews and four of those states responded to the interview request. The states were selected for the diversity of their GME funding mechanisms, based upon examination of the AAMC 50-State Survey and interviews with experts in the field. Interviews were conducted with Minnesota, New York, Oklahoma and Texas. Characteristics of these states, compared to Massachusetts, are shown in the tables below.

State	Population	Residents	Residents/ 100,000	# of sponsoring institutions
MA	6.6 million	5,414	82.2	25
MN	5.3 million	2,183	40.8	10
NY	19.5 million	15,989	82.1	58
OK	3.8 million	810	21.4	7
TX	25.7 million	7,395	28.8	38

[31] Medicaid Graduate Medical Education Payments: A 50-State Survey. Association of American Medical Colleges. March 2013. Available at: https://members.aamc.org/eweb/upload/Medicaid%20Graduate%20Medical%20Education%20Payments%20A%2050-State%20Survey.pdf

State	Medicaid GME Payments (2012)	Medicare GME Payments (Total IME and DME Combined) (2011)
MA	n/a	$597.8 million
MN	$40.1 million	$165.4 million
NY	$1,815.0 million	$2,028.5 million
OK	$73.4 million	$53.8 million
TX	$32.0 million	$296.9 million

The state interviews focused on the governance structures for GME, types of funding mechanisms used, the eligibility criteria for institutions to receive funding (i.e. hospitals, training programs, or non-hospital clinical sites), and the types of trainees targeted by these arrangements (e.g. primary care residents, specialty care residents, nurse practitioners, and physician assistants)

Minnesota

Minnesota primarily provides state funds for GME through the Medical Education and Research Cost Fund (MERC). MERC was established in 1996 by the Minnesota legislature. The legislature found that teaching facilities were facing a competitive disadvantage as third party payers were becoming less willing to pay the higher costs associated with such facilities. The MERC fund was created to pay a portion of the costs of clinical training to alleviate some of the burden on these facilities.

The MERC funding mechanism has changed since its inception. Currently, the fund combines revenue from a per-pack cigarette tax and the Prepaid Medicaid Assistance Program (PMAP). The cigarette tax nets roughly $3.9 million in state taxes that are transferred to the MERC fund. This amount receives the standard Medical Assistance Federal Match which is roughly one-to-one for Minnesota. This amount is also added to the fund.

In addition, Minnesota “carves out” a percentage of its state general funds used for capitation payments to health plans under the PMAP. These carve outs also receive the standard federal match. The amount of the carve outs have diminished over the past few fiscal years. For FY14 and FY15, an estimated $49 million in combined state and federal funds will be distributed.

Finally, the University of Minnesota makes several transfers to the Department of Human Services for the purposes of supporting Graduate Medical Education.

The MERC fund distributes its funds to “training sites” by transferring funds to those sites’ “sponsoring institutions.” The sponsoring institutions then must transfer to each training site the funds they are entitled to as defined by the initial distribution from the MERC fund. The first barrier that sponsoring institution must pass is to demonstrate that they are a teaching program. From there, each site is

allocated funds based on the individual training sites' relative public program volume. The relative public program volume is determined by calculating each individual training site's percentage of the total training sites' public program volume.

The MERC also adds a supplemental grant of 20% on top of the original grant to any site whose Medicaid revenue accounted for more than 0.98% of the total Medicaid revenue. The 20% supplement grant is borne by the sites whose revenue accounts for less than 0.98% of the total Medicaid revenue pool.[32] Sites whose total grant would be less than $1,000 are eliminated from the distribution. Portions of the distribution formula were changed in Minnesota's most recent legislative session. Changes included a gradual phase-out of the 20% supplemental grant, which will decrease to 10% in SFY14 and disappear thereafter, and the addition of community health workers, community paramedics, and other provider types to the list of eligible providers for MERC.

Funds support training for medicine, physician assistants, dentistry, advanced practice nursing, chiropractic and pharmacy.

New York

New York has more medical residents than any other state. New York has a number of programs to support GME, with Medicaid being by far the largest source of state funds. In 2012, New York made $1.8 billion in Medicaid GME payments. New York's Medicaid program pays GME through both FFS and managed care. New York's Medicaid funding for GME includes both DME and IME payments. It funds GME through state appropriation as well as a "covered lives assessment" on third party payers.

New York created the New York State Council on Graduate Medical Education by Executive Order in 1987. The Council consists of 30 members appointed by the Governor. The Council provides the Governor and Commissioner of Health with advice and guidance on Graduate Medical Education policies in the state. The Council is charged with the following:

1. Graduate medical education programs including the composition, supply and distribution of residency programs, subspecialty programs and fellowship training;
2. Efforts to increase the number of minority physicians in training in New York and to increase and improve the training of physicians who will serve as medical residents, and subsequently as practitioners, in underserved areas of the State and serve populations with special health needs;
3. The number and specialties of physicians needed in New York State;
4. Policies and programs to increase the training of primary care physicians and the training of physicians in non-hospital settings; and

[32] Emily Cleveland. "Medical Education and Research Costs (MERC): Funding Mechanisms" House Research, Short Subjects. December 2011. Available at: http://www.house.leg.state.mn.us/hrd/pubs/ss/ssmerc.pdf. Accessed on: June 1, 2013.

5. Promotion of high quality residency and training programs.[33]

The Council has created several sub-committees and work groups that develop policy and individual programs which are administered by Council staff. The Council staff is located in the Office of Health Insurance Premiums in the Department of Health. The Council and its staff helped to create and oversee the Empire Clinical Research Investigators Program (ECRIP); grant programs to promote minority participation in medical education; the NYS Area Health Education Center (AHEC) program; the Institutional GME Budget; and the DOH Clinical Clerkship Survey.

In addition, the Council and its staff helped create and administer the Doctors Across New York (DANY) programs, which are aimed at training and placing physicians in underserved communities. These programs include Physician Practice Support, Physician Loan Repayment, Ambulatory Care Training, Diversity in Medicine and Physician Workforce Studies. New York also has a GME reform incentive pool/innovation pool which is aimed at encouraging new approaches to enrich teaching and address statewide residency and physician workforce goals. This pool is currently unfunded. In the past, New York also had a Designated Priority, or "Upweighting" program, that applied a tiered adjustment to Medicaid GME rates so that certain primary care programs received enhanced payments, but this program ended in 2009.

Oklahoma

The Oklahoma Health Care Authority (OHCA) oversees the majority of GME funding in Oklahoma. There are three types of payments: DME and IME payments to hospitals, and payments made under Oklahoma's managed care waiver that are provided to medical schools.

Oklahoma makes quarterly direct GME supplement payments to hospitals based on resident months weighted for Medicaid days and acuity. This methodology was created to enhance GME payments and to replace reimbursements lost through implementation of managed care systems of payment. The payments are made from a pool of funds made available by matching the State funds transferred to the OHCA by the University Hospital Authority from general appropriations. In SFY 2012, the total amount of direct GME supplement payments was $16 million with roughly $5.5 million being provided by the state through the University Hospital Authority and $10.5 million being provided by the federal government.

Oklahoma also makes Indirect Graduate Medical Education payments to major teaching hospitals. To be eligible for this payment, the teaching hospital must have 150 or more resident full-time equivalents (FTEs). Only two hospitals are eligible and they split the funds equally. Payments are made once a year, with state funds coming from the Oklahoma University Hospital Trust/Authority and the Oklahoma State University Hospital Trust/Authority. For SFY 2013 (for which payments were made in

[33] 8th Report & Policy Recommendations. New York State Council on Graduate Medical Education. September 2011. Available at: http://www.health.ny.gov/professionals/doctors/graduate_medical_education/reports/docs/09-2011_eighth_report_and_policy_recommendations.pdf. Accessed on: June 1, 2013.

August 2012), each hospital received $15.2 million in funds with $5.5 million from the state and $9.7 million from the federal government.

Under the managed care waiver, payments are made directly to three major colleges of medicine – University of Oklahoma – OKC, University of Oklahoma – Tulsa, and OSU School of Osteopathy. These schools operate clinics throughout the state in both hospital and non-hospital settings. The payments are made in support of a contracted number of managed care recipients with a PCP who is a member of the college of medicine's staff and in support of contractually defined specialty care services. In SFY 2013 the schools received $74 million in payments.

The payments are intended to support GME but also ensure access to care for SoonerCare recipients. Payments are contingent on the contractors' continued performance in providing primary care and specialty services to Oklahoma Medicaid recipients, with the following requirements:

> **SoonerCare member months:** a pre-established minimum number of member months (131,400 per quarter for OSU and 137,850 for OU OKC and Tulsa combined) will be maintained.
> **Emergency Room utilization rate:** a pre-established maximum utilization rate established as that occurring during the first quarter of SFY 2006 (65 visits per 1,000 members for OU and 63 visits per 1,000 members for OSU) will be maintained
> **Early Periodic Screening, Diagnosis and Treatment (EPSDT) screening rate:** a pre-established minimum screening rate (45% for OU and 63% for OSU)
> **Breast Cancer and Cervical Cancer screening rates:** pre-established minimum screening rate (4% for breast cancer and 48% for cervical cancer for OU; 37% for breast cancer and 55% for cervical cancer for OSU).
> **Specialty physicians employed by contractor**: minimum number of specialty physicians (350 for OU and 200 for OSU) actively enrolled as Medicaid Providers.

In terms of governance, Oklahoma created the Physician Manpower Training Commission (PMTC) in 1975 to administer programs with the goal of encouraging medical and nursing personnel to practice in rural and underserved areas. The PMTC oversees the Oklahoma Rural Medical Education Scholarship, the Oklahoma Intern-Resident Cost-Sharing Program, the Physician Placement Program, the Nursing Student Assistance Program, the Family Practice Resident Rural Scholarship Program, the Physician/Community Match Loan, and the Physician Assistant Scholarship Program. These programs have been utilized to increase the numbers of residents, physicians, nurses and physicians assistants serving rural areas in Oklahoma.

Texas

Texas funds GME through three sources: Medicaid, formula funding provided directly to medical schools, and the Texas Higher Education Coordinating Board (THECB). Texas' organizational structure separates reimbursements for education expenses and medical expenses. Under Texas' system, Medicaid reimburses certain hospitals for medical expenses incurred through GME, the formula funding supports the education and operation of residency training programs affiliated with one of the

state's eight public and one independent medical schools, while the THECB programs fund specific residency programs and support educational costs. This structure allows the THECB to focus solely on coordinating the educational aspects of GME in relation to all Texas' higher education needs.

The THECB has several programs to fund GME. All funds go directly to residency programs or to the health-related institutions. The first program provides roughly $4,400 per resident through an allocation formula. The total allocation was $56 million over 2012-2013. In addition, the THECB provides an additional payment of $3,800 per resident to family medicine residents through a trusteed fund that the THECB administers. There are 26 programs, and a total of $5.6 million was provided in 2012-2013. Appropriations have been declining; however, the Texas Legislature recently appropriated an additional $16.35 million for six new programs to support medical and graduate medical education efforts to address concerns about the need for additional GME positions.

Additionally, Medicaid provides about $32 million per year for GME. To be eligible for Medicaid GME payments, the teaching hospital must be state-owned or operated. There are a total of five eligible hospitals. Each of these hospitals provides funds to match dollars appropriated by the legislature.

Summary

In summary, most states provide Medicaid GME funding, and some states have additional funding streams such as cigarette taxes, general fund appropriations, insurer assessments, and other special funds. Some states have coordinating bodies or councils that oversee GME policy and/or funding. There is some variation across states as to the inclusion of non-hospital sites. Across states, it is clear that overall funding levels are subject to state budgetary pressures.

8. Findings and Recommendations

In its deliberations, the Commission carefully considered its statutory charge, discussed the information presented at its meetings, and weighed goals for GME in the Commonwealth. As result of this process, the Commission has developed the following findings and recommendations for Graduate Medical Education in the Commonwealth.

Findings

Value of Graduate Medical Education

The Commission affirms the important role that graduate medical education plays in the Commonwealth. The benefits of graduate medical education include, but are not limited to:

- Providing clinical care to many patients in the Commonwealth, in both the inpatient and outpatient settings, that could not otherwise be provided;
- Training the next generation of physicians to meet the medical needs of residents of the Commonwealth;
- Providing valuable teaching services, such as in the education of medical students;
- Promoting innovation in medical care and research;
- Attracting and retaining talented faculty within the Commonwealth;
- Providing highly specialized services that are not available in non-academic settings;
- Providing care to underserved populations;
- Attracting grant funding; and
- Contributing to the local economy.

Impact of payment and delivery system reform

The Commission recognizes that payment and delivery system reform may change the healthcare landscape in the Commonwealth, such as by increasing demand for primary care clinicians and requiring provision of coordinated, team-based care. These changes will affect the demands on the GME system moving forward, including the supply of and demand for different types of specialties of providers as well as the type of training that will be needed.

Financing structure

While it is difficult to determine whether the current level of GME funding is adequate using available data and analyses, the Commission acknowledges that the current formulas for the distribution of funds are not optimally structured to ensure that programs are appropriately compensated for their incurred costs. In reaching this finding, the Commission reviewed other states' approaches to funding GME, as well as estimates of the adequacy of GME funding from all sources, which demonstrate a range of estimated costs associated with GME funding and rely on a number of assumptions.

Recommendations

Financing of Graduate Medical Education

In recognition of the important role played by GME in the Commonwealth and in recognition that the current system does not optimally structure GME payments, the Commission supports additional funding for GME that is tied to performance benchmarks. These performance benchmarks should take into consideration factors such as:

- Retention rates of physicians within the Commonwealth;
- Training of physicians in specialties where there are physician shortages (such as those that currently exist in primary care, psychiatry, and general surgery);
- Training of physicians in community health centers, following the model of the Teaching Health Center Graduate Medical Education Program, or other programs sites and geographic areas that will help address physician shortages in those practice settings or areas, particularly those with vulnerable populations, provided that these program sites are affiliated with accredited training programs;
- Quality measures for Graduate Medical Education; and
- Provision of training that supports the goals of payment and delivery system reform and transparency in expenditure of funds.

These performance considerations should apply to existing and additional funding sources. The financing system should encourage a graduate medical education system that is nimble in responding to the needs of the Commonwealth.

Governance

To enhance the focus on GME in the Commonwealth, the Commission recommends that a specific entity be given clear responsibilities related to Graduate Medical Education. The Commission recommends that these responsibilities be assigned to the Health Care Workforce Center. The Commission further recommends that the Health Care Workforce Center convene an advisory committee on Graduate Medical Education that includes representatives of the organizations included in the Special Commission on Graduate Medical Education.

Responsibilities of the Health Care Workforce Center should include: data collection (as discussed in the next recommendation), communication about the importance of GME; coordination of efforts with the Health Planning Council, the Department of Public Health, EOHHS/MassHealth, the Health Care Workforce Trust Fund Advisory Board, and the Health Policy Commission, among others; coordination with and support to loan forgiveness and other workforce retention initiatives; and oversight over the distribution of additional funding, as described above.

Data Collection:

The Commission identified a number of areas where additional data related to GME in the Commonwealth could be useful. Data collection should be undertaken by the Health Care Workforce

Center and should be coordinated with existing data collection efforts. Data to be collected should include: tracking the number and geographic and specialty distribution of programs in the Commonwealth; tracking physician workforce, including actual practicing full-time equivalent physicians; tracking program distribution by the demographic mix of the populations served; monitoring the funding received by programs in the Commonwealth for GME as well as related workforce programs; monitoring the retention of trainees, by specialty, geographic region, practice setting, and population demographics; monitoring the quality of GME programs; and monitoring the impact of Massachusetts GME programs on the Commonwealth and the nation.

Appendix : Briefing Book

Materials and Documents

1. **2012 MMS Physician Workforce Study**
   http://www.massmed.org/AM/Template.cfm?Section=Research_Reports_and_Studies2&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=77980

2. **AAMC Medicaid Graduate Medical Education Payments: A 50-State Survey**

3. **AAMC 2011 State Physician Workforce Data Book**
   https://www.aamc.org/download/263512/data/statedata2011.pdf

4. **2011-2012 ACGME Data Resource Book**
   http://www.acgme.org/acgmeweb/Portals/0/PFAssets/PublicationsBooks/2011-2012_ACGME_DATABOOK_DOCUMENT.pdf

5. **Hospital Caps**

   Massachusetts FY 2010

   Get IME: 31 Teaching Hospitals
   Cap: 3715 FTEs
   Count: 4019 FTEs
   Cap vs. Count: 304 FTEs Over the Cap

   Get DME: 30 Teaching Hospitals
   Cap: 3903 FTEs
   Count 4184 FTEs
   Cap vs. Count: 281 FTEs Over the Cap

6. **Institute of Medicine Committee on Governance and Financing of Graduate Medical Education September 2012 Meeting Presentations**
   http://www.iom.edu/Activities/Workforce/GMEGovFinance/2012-SEP-04.aspx

   Individual presentation links:

   - **Fern Goodhart,** *Office of Senator Tom Udall, NM*
     Raises questions regarding the best model for GME Funding.

http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/GoodhartPresentation.pdf

- **Marc Hartstein,** *Director – CMS Hospital and Ambulatory Policy Group*
  Explains Medicare payment for GME including history, calculation of DGME, IME, Disproportionate Share and recent reallocation of slots.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/HartsteinPresentation.pdf

- **Dianne Heffron**, *Director – CMS Financial Management Group*
  Explains GME Payments in Medicaid.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/HeffronPresentation.pdf

- **Robert Petzel,** *M.D. Under Secretary of Health U.S. Department of Veterans' Affairs*
  Malcolm Cox, *M.D. Chief Academic Affiliations Officer U.S. Department of Veterans' Affairs*
  Explains the VA's role in GME.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/PetzelCoxPresentation.pdf

7. **Institute of Medicine's Committee on Governance and Financing of Graduate Medical Education December 2012 Meeting Presentations**
   http://www.iom.edu/Activities/Workforce/GMEGovFinance/2012-DEC-19.aspx

   Individual presentation links:

   - **Karl Auerbach**, *M.D., MS, MBA, FACOEM, President of American College of Occupational and Environmental Medicine (ACOEM)*
     Role and need of Occupational Medicine physicians in the future of healthcare delivery.
     http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Auerbach.pdf

   - **Paul Batalden**, *M.D., Professor at the Dartmouth School of Medicine*
     Performance Development
     http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Batalden.pdf

   - **Marc Boom,** *M.D. President and CEO of the Methodist Hospital System*
     Breaks down the DGME and IME funding to Methodist Hospital System and how it does not cover the cost of academic infrastructure for their hospital.

http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Boom.pdf

- **Boyd Buser,** *D.O. Dean of the Kentucky College of Osteopathic Medicine and Vice President for Health Services*
  Accountability Presentation: GME support for osteopathic medicine
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Buser-Accountability.pdf

- **Boyd Buser,** *D.O. Dean of the Kentucky College of Osteopathic Medicine and Vice President for Health Services*
  Costs and Financing Presentation: Limitations of current GME financial support from Medicare
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Buser-Costs%20and%20Financing.pdf

- **Nick Busing**, *MD, CCFP, FCFP, President and CEO of the Association of Faculties of Medicine of Canada*
  Canadian post-graduate medical education
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Busing.pdf

- **Ralph G. Dacey Jr.,** *MD, Professor and Chairman – Department of Neurosurgery Washington Universitery, President of the Society of Neurological Surgeons*
  A perspective of GME from view of a neurosurgeon
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Dacey.pdf

- **Arnold Eiser,** *MD, FACP, Vice President of Medical Education, Mercy Health System SEPA, Associate Dean, Mercy Programs and Professor of Medicine, Drexel University College of Medicine*
  Discusses effect of recent or proposed GME regulations or policies on safety net hospitals. Discusses adverse effect on the society when safety net hospitals close.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Eiser.pdf

- **Arthur Garson Jr.,** *MD, MPH Director for the Center for Health Policy University of Virginia*
  Presents a new model of health care delivery that is integrated system based
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Garson.pdf

- **Christopher Gonzalez,** *MD, MBA, FACS. Testimony on behalf of the American Urological Association*
  Discusses the adverse effect of current GME funding caps on certain subspecialist's ability to provide care to the US population.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Gonzalez.pdf

- **David Goodman**, *MD, MS, Professor of Pediatrics and of Health Policy, Director of the Center for Health Policy Research*
  Align GME expenses and workforce needs.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Goodman.pdf

- **Atul Grover,** *MD, PhD, Chief Public Policy Officer - AAMC*
  Describes the future needs and supply of physician workforce.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Grover.pdf

- **David Hoyt**, *MD FACS, Executive Director American College of Surgeons*
  A surgeon's perspective on GME funding and proposals.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Hoyt.pdf

- **Tim Johnson**, *Senior VP and Executive Director for the Center for GME Policy and Services, Greater New York Hospital Association*
  New York teaching hospitals' perspective on GME.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Johnson.pdf

- **Jim Kaufman**, *Children's Hospital Association*
  GME and CHGME funding of pediatric hospital graduate medical education
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Kaufman.pdf

- **Tom Nasca,** *MD MACP, CEO - ACGME*
  ACGME and CLER.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Nasca.pdf

- **Judy Pauwels**, *MD University of Washington Department of Family Medicine*
  Finances and start-up challenges for community-based programs.

http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Pauwels.pdf

- **David Reines**, *MD, FACS, Vice Chair of COGME*
  Council on Graduate Medical Education report.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Reines.pdf

- **Tom Ricketts**, *PhD, MPH, The University of North Carolina at Chapel Hill*
  Describes the future needs and supply of physician workforce.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Ricketts.pdf

- **Lewis Sandy,** *United Health Group*
  Costs and financing of GME.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Sandy.pdf

- **David Squire,** *Assistant Dean of Finance – University of Utah School of Dentistry*
  Lessons learned from the Utah Medical Education Council.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Squire.pdf

- **George Thibault,** *MD, President of Josiah Macy Jr. Foundation*
  Ensuring innovation in medical education.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Thibault.pdf

- **Linda Thomas-Hemak,** *MD, President and CEO Wright Center for Graduate Medical Education*
  Nonprofit GME Consortium promoting healthcare delivery and workforce education in the community.
  http://www.iom.edu/~/media/Files/Activity%20Files/Workforce/GMEGovFinance/2012-DEC-19/Thomas-Hemak.pdf