MEMORANDUM

Date: July 2, 2014

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

Re: **Benefits of Graduate Medical Education Programs**

A variety of questions have been asked of staff about Pima County's funding of the Graduate Medical Education (GME) program at The University of Arizona Health Network and its benefit to the community. The following provides an overview of the program and a report on the benefits of GME in Pima County.

GME is a program through which teaching hospitals are compensated for costs associated with operating GME programs or for the training of residents. Residents are physicians who have graduated from medical school and are completing their hands-on training. GME funds are not distributed to the student, nor are they used for tuition.

Through the Intergovernmental Agreement between Pima County, The University of Arizona Health Network (UAHN) and the Arizona Board of Regents (ABOR), the County and ABOR commit to utilizing General Funds as local match to generate new federal funds to offset the physician training costs at The University of Arizona Medical Center–South Campus. The local match is sent to the Arizona Health Care Cost Containment System (AHCCCS), which reports the receipt of this money as State match to the federal government and requests the new federal funds for the hospitals based on the federally approved match ratio of two to one ($2 federal dollars for every $1 in General Fund state match.

Attached is an executive summary entitled *The Benefits of Graduate Medical Education Programs*, a summary of UAHN Graduate Medical Resident Retention in Arizona, and a selection of significant reports on GME.

As noted in previous memoranda to the Board regarding the topic, the County's $15 million contribution to ABOR for GME is an economic multiplier.

CHH/mjk

Attachments

c: Jan Lesher, Deputy County Administrator for Medical and Health Services

The Benefits of Graduate Medical Education Programs
Funding, Retention and Access to Quality Care

Graduate Medical Education (GME) is the residency phase of physician training, providing medical school graduates with supervised, clinical training in a chosen specialty or field that is necessary to prepare them for independent patient care and entry into clinical practice. GME programs are typically sponsored by participating hospitals and clinical networks which bear a significant fiscal burden in the provision of this key element of physician training. This investment is critical since the location of the GME training program is an important predictor of subsequent practice location and therefore has implications for the quality of medical care available in local communities.

How is GME funded in Pima County

The Centers for Medicare and Medicaid Services (CMS) is the main supporter of GME nationally. CMS provides funding through a federal matching program intended to offset some of the clinical education the expenses incurred by hospitals in the training and oversight of these residency programs as they provide care to local patients. States have historically provided funding to GME-participating medical facilities as the local match, allowing them to secure CMS federal funds in an approximate 2:1 return. Recent budget decisions made at the state level have terminated Arizona Health Care Cost Containment System (AHCCCS, Arizona's Medicaid agency) contribution of the local matching funds. In FY2009, Pima County developed and initiated a plan that has allowed local GME to continue to provide the funds that are required for the federal match.

The University of Arizona Health Network (UAHN) operates two full-service hospitals in Pima County, University of Arizona Medical Center – University Campus (UAMC-UC) and University Medical Center – South Campus (UAMC-SC). Since Pima County has provided the local match, the residency program has expanded from 17 (FY2009) to 110 (FY2013) GME residents at UAMC-SC alone. These residency positions are primarily internal and family medicine, followed by psychiatry and emergency medicine. A variety of training programs including neurology, surgery, ophthalmology and others are also offered as part of this GME program. Attachment I "UAHN Graduate Medical Education Resident Retention in Arizona" details UAHN GME graduates by specialty, campus, year of graduation and indicates the number practicing in Arizona for both UAHN hospitals through 2013. Of the 71 physicians that have completed the GME program at UAMC-SC, 45% have remained in state. Three quarters of these doctors are practicing in southern Arizona. An additional 21% have pursued out of state subspecialty fellowship training. Historically, a significant percentage of those physicians will return to practice in the region where they completed their primary GME training. UAMC-SC has been particularly successful retaining graduates in the primary care fields of medicine, with nearly 50% (19 of 40) establishing practices in Arizona. This is of particular value given the shortage of primary care doctors in the region and the decreased number of medical students choosing primary care as a field of medicine. The UAMC-SC GME program has also been successful at retaining psychiatry graduates, a field that is markedly understaffed. In total 8 of 18 graduates trained at this facility through 2014 are still practicing in Pima County, including half of the 2014 class.

Jointly, Pima County and the University of Arizona have provided $50M in local funds that have been used to secure $126.2M in federal dollars for the local GME program that would otherwise not have been available. This is 2.5 times the amount of County funds expended. An additional $4.2M was

provided in partnership with Tucson Medical Center, resulting in another $8.6M in new federal funds flowing into Pima County. These dollars are primarily spent in the county, providing both a training benefit and an indirect financial benefit to the community.

A 2002 study documented that the placement of a single primary care physician in a community results in a direct economic benefit of approximately $1M per year of practice.[i] Based on the retention figures in Attachment I and applying the economic benefit projection, the UAHN hospital system GME graduates have contributed to an estimated $510 million dollar benefit statewide, with UAMC-SC accounting for $56 million in just 5 years. This impact will continue to grow as local practices mature and as GME graduates establish new practices with each progressive year.

Why an investment in GME is necessary in Pima County

Large areas of Pima County have been designated as Health Professional Shortage Areas (HPSA) by the US Department of Health and Human Services. HPSAs are a geographic area, population group, or health care facility that has been designated by the Federal government as having a shortage of health professionals. The negative impacts of health professional shortages include decreased access to care, increased wait times to see a provider, shifting patient load to emergency services, and increased burden of unmanaged chronic disease.

A shortage of primary care providers is particularly detrimental, and competition for these providers is increasing as access to medical services is expanded under the ACA and Medicaid expansion. Reduced numbers of primary care physicians means fewer appointment slots available to the community and fewer opportunities for patients to receive office or clinic care. Those patients who do receive care often must schedule appointments further out than they would if there were an adequate pool of physicians in the area. Inability to connect with primary care will direct more patients to urgent and emergency care facilities for issues more appropriately addressed in a clinic setting.[ii iii] This increases cost to the patient and the facility as well as clogs these services. Finally, research indicates that chronic diseases are less well-managed in HPSAs as compared to regions with a full ratio of providers to residents.

Despite the continuing and significant need for doctors in this specialty, primary care has become a less attractive field for US medical school graduates. Fewer than 20% of medical students are choosing family practice or other primary care specialties and placement of graduates into family practice residency positions has decreased by more than 50% since 1998.[iv]

Nationwide, GME programs are linked to a documented increase in physician retention in the communities providing this training. The likelihood of a physician remaining in the state where they completed a GME program is 23% higher than a physician remaining in the state where they solely completed medical school.[v] Development of residency programs and GME funding systems are cited as key initiatives to address physician shortages and retain doctors trained in the state. The American Medical Association estimates that Arizona needs an additional 850 to 885 residency trainees, approximately 300 of which should be primary care residents, in order to meet national standards for care.[vi]

Conclusion

The continued provision of funding for the local match portion of GME provides benefits to Pima County residents by enhancing access to quality health care, improving the skills and array of services GME-trained doctors are able to provide, bringing significant new federal funds into the community, and providing an indirect financial benefit to the jurisdiction through the economic activity associated with the entry of new physician practices into the community.

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[i] Pugno et al, The Direct, Indirect and Intangible Benefits of Graduate Medical Education Programs to Their Sponsoring Institutions and Communities, Journal of Graduate Medical Education, June 2010

[ii] Choudhry et. al., The Impact of Community Health Centers and Community-Affiliated Health Plans on Emergency Department Use, April 2007, Association for Community Affiliated Plans

[iii] Begley et., al., Emergency room use and access to primary care: Evidence from Houston, Texas, Journal of Health Care for the Poor and Underserved, 2006 Aug;17(3):610-24

[iv] National Association of Community Health Centers, Health Centers' Contributions to Training Tomorrow's Physicians, August 2010

[v] Krupa, C, How states are keeping doctors from moving out, American Medical News, Dec 19, 2011

[vi] St. Luke's Health Initiatives Arizona Policy Primer, Graduate Medical Education in Arizona: Growing the Physician Pipeline, March 2012

Attachment I

UAHN Graduate Medical Education Resident Retention in Arizona

UAHN Graduate Medical Education Resident Retention in Arizona

by Specialty, Campus and Year of Graduation

		2009			2010			2011			2012			2013			Total		
		# Grad	# in AZ	% in AZ	# Grad	# in AZ	% in AZ	# Grad	# in AZ	% in AZ	# Grad	# in AZ	% in AZ	# Grad	# in AZ	% in AZ	# Grad	# in AZ	% in AZ
Primary Care	UAMC-UC	45	8	18%	43	9	21%	49	27	55%	45	13	29%	51	10	20%	233	67	29%
	UAMC-SC	2	1	50%	5	2	40%	5	2	40%	12	8	67%	16	6	38%	40	19	48%
Other Specialty Medicine	UAMC-UC	33	7	21%	32	9	28%	35	8	23%	32	5	16%	30	7	23%	162	36	22%
	UAMC-SC	0	0	-	1	0	0%	1	0	0%	4	1	25%	4	2	50%	10	3	30%
Emergency/Surgery	UAMC-UC	24	8	33%	32	10	31%	29	11	38%	25	3	12%	30	6	20%	140	38	27%
	UAMC-SC	0	0	-	0	0	-	0	0	-	0	0	-	10	5	50%	10	5	50%
Psychiatry	UAMC-UC	7	3	43%	6	1	17%	3	1	33%	4	0	0%	6	2	33%	26	7	27%
	UAMC-SC	0	0	-	0	0	-	3	1	33%	3	2	67%	5	2	40%	11	5	45%
TOTAL	UAMC-UC	109	26	24%	113	29	26%	116	47	41%	106	21	20%	117	25	21%	561	148	26%
	UAMC-SC	2	1	50%	6	2	33%	9	3	33%	19	11	58%	35	15	43%	71	32	45%
	Combined	111	27	24%	119	31	26%	125	50	40%	125	32	26%	152	40	26%	632	180	28%

 # Grad: The number of residents who graduated from the GME program for that time period

 # in AZ: The number of graduates who remained in Arizona to establish their practice

% in AZ: The percentage of graduates who remained in Arizona to establish their practice for the given time period

Primary Care: Family Medicine, Internal Medicine, Pediatrics

Other Specialty Medicine: Anesthesiology, Dermatology, Neurology, Obstetrics/Gynecology, Ophthalmology, Pathology, Radiology, Radiation Oncology

Emergency/Surgery: Emergency Medicine, Combined Emergency Medicine/Pediatrics, General Surgery, Neurosurgery, Orthopaedic Surgery, Urology, Vascular Surgery

Psychiatry: Psychiatry

1. Pugno PA, Gillanders WR, Kozakowski SM. **The direct, indirect, and intangible benefits of graduate medical education programs to their sponsoring institutions and communities.** J Grad Med Educ. 2010;14:154–159. doi: 10.4300/JGME-D-09-00008.1.

"Conclusion

The community benefits of GME programs extend far beyond the walls of the teaching hospital. Through service to individuals and the community at large, these programs contribute positively in ways far beyond what may be found on the typical hospital revenue and expense report. A full appreciation of the breadth and depth of benefits these programs render to their institutions and communities provides an important perspective for planning, resource allocation, innovation, and quality impacts within the institutions that sponsor them.

The authors recognize the importance of periodically evaluating all programs, including GME. Undoubtedly, there are situations in which a residency program no longer fits the sponsoring institution's strategic vision. However, when dire financial circumstances suggest that a residency no longer seems sustainable, it may be important to consider the indirect economic benefits and market-based replacement costs for services the residency program provides. Our collective experience has been that the strategic review of a GME program often is based on direct profit and loss assumptions. Due diligence requires that the calculations include:

1. Direct revenue and expenses, including full credit of federal and state GME support.
2. Analysis of indirect revenue and expenses associated with the program, with some attempt to analyze indirect contribution margin and the value of care to the poor and vulnerable as part of an institution's community benefit contribution.
3. Making defensible assumptions about the intangible benefits of the residency, and comparing them to the intangible benefits of other programs sponsored by the hospital.

It is our experience that a complete analysis often demonstrates a very positive benefit of GME to the sponsor's environment, although the direct subsidy may initially appear substantial. This impression is supported by several studies, but there are gaps in the evidence and further investigation is warranted.38,39 Studies that quantify the net/net economic benefit of GME programs to their sponsoring institutions, although limited, are consistent in their favorable findings. More study is needed to further quantify these benefits so that the administrators of sponsoring institutions may better understand the magnitude of the contributions of their GME programs. We hope that this review will spur further research and focused discussion regarding the impact of GME programs on their sponsors and communities. Only through a comprehensive understanding of the breadth, depth, and magnitude of the favorable benefits that a GME program brings to its sponsoring institution and community can health care planners adequately prepare to meet patient care needs in our present turbulent environment, and for the uncertain future." (p158)

2. Pugno PA, Gillanders WR, Lewan R, Lowe KD, Sweha A, Xakellis GC. **Determining the true value of a family practice residency program.** Fam Pract Manag. 2000;7(6):39–42.

The development of a financial model for family practice residency programs that attempts to incorporate all of the "contributions residencies make to their sponsoring institutions and local communities." (p1)

The model is available for download here: http://www.aafp.org/fpm/2000/0600/fpm20000600p39-rt1.doc

3. Schneeweiss R, Ellsbury K, Hart LG, Geyman JP. **The economic impact and multiplier effect of a family practice clinic on an academic medical center.** JAMA. 1989;262(3):370–375.

"For every $1 billed for ambulatory primary care, there was $6.40 billed elsewhere in the system. Each full-time equivalent family physician generated a calculated sum of$784 752 in direct, billed charges for the hospital and $241 276 in professional fees for the other specialty consultants. The cost of supporting a primary care clinic is likely to be more than offset by the revenues generated from the use of hospital and referral services by patients who received care in the primary care setting." (p370)

4. Shine D, Sumbal B, Jaeger J, Pencak D, Panush R. **Association of resident coverage with cost, length of stay, and profitability at a community hospital.** J Gen Inter Med. 2001;16(1):1–8.

"We conclude that teaching hospitals should not assume an adverse effect of residency training on profitability, even if residents are shown to increase resource use. With the advent of comprehensive patient-based computer databases and the availability of risk adjustment software, even relatively small teaching hospitals may be able to review the economic consequences of their own teaching programs." (p8)

5. Nicholson S, Pauly MV, Burns LR, Baumritter A, Asch DA. **Measuring community benefits provided by for-profit and nonprofit hospitals**. Health Aff (Millwood). 2000;19(6):168–177.

"We have defined community benefits relative to a benchmark of an otherwise identical for-profit hospital. We believe that defining benefits as the addition to or differences from what the benchmark hospital would do is fair to hospitals of all ownership types and relevant for the kinds of actions (private or public) that communities seek to take in response to this kind of information. However, using for-profit hospital behavior to define the expectations of nonprofit hospitals does not imply either approval or disapproval of the level of community benefits for-profit hospitals provide.

We also have concluded that the least equivocal and most relevant set of community benefits are those services provided at zero or reduced prices to members of the community needing help to increase their consumption (because their incomes are low or their health risks are high)." (p176)

6. Everett G, Uddin N, Rudloff B. **Comparison of hospital costs and length of stay for community internists, hospitalists, and academicians**. J Gen Intern Med. 2007;22(5):662–667.

"The type of hospital physician provider can have a dramatic effect on hospital costs and LOS. The current and projected rise of Medicare, Medicaid, and uninsured populations characterized by fixed payment or very low payment will likely place increased economic pressure on hospital managers to seek the most cost-effective inpatient providers. Future research should be done to better delineate total health care costs within specific geographic areas to evaluate the quantity of cost shifting that is occurring between inpatient, outpatient, and long-term care facilities. Also, objective quality-of-care markers, in addition to mortality, are needed to compare the true efficiency of health care providers." (p666)

7. Blumenthal D, Campbell EG, Weissman JS. **The social missions of academic health centers**. N Engl J Med. 1997;337(21):1550–1553.

"A convincing rationale exists, we believe, for continuing to protect the social missions of academic health centers from the full force of unfettered markets. In return, however, academic health centers and any other institutions that pursue these protected functions must embrace reforms that many will find difficult. The formulation of wise public policy will depend on the improved collection and analysis of data to track the effects of this changed environment on the valued social missions that academic health centers have served in the past." (p1553)

8. Saultz JW, McCarty G, Cox B, Labby D, Williams R, Fields SA. **Indirect institutional revenue generated from an academic primary care clinical network**. Fam Med. 2001;33(9):342–345.

"**Conclusions:** This study demonstrates that patients from the primary care system account for 18.5% of total charges for hospital care and 17.6% of the specialty physician business. Further, the difference in collection rates for primary care and non-primary care patient populations was small. The method of analysis used in this study was simply and quickly done using existing billing data from a university hospital and a faculty practice group. The results of this study are compatible with other studies that have used more laborious methods." (p671)

9. **Graduate medical education in Arizona: Growing the Physician Pipeline**. St. Luke's Health Initiatives. 2012.

"With the suspension of state funding for graduate medical education, Arizona is forfeiting millions in federal matching funds that could be utilized to ensure that existing programs stay in place and that new ones are created to meet our current and future needs. Maintenance and expansion of residencies will help Arizona to better leverage new public and private investments in medical schools by creating an environment where physicians are able to complete all of their training in state. Further, residents play a critical role in training medical students in the clinical portion of their educational program. Support of physician training is a wise investment to improve quality of life for all Arizonans, as well as strengthen the economy through a more vibrant healthcare sector." (p27)

10. **Annual Report on Graduate Medical Education in Florida**. The Graduate Medical Education Committee, Florida Department of Health. 2005.

"It is important to note that although hospitals with residency programs may report higher cost per case, they are incredibly beneficial to the patient, the hospital, and the state. These hospitals not only provide safety net services, but also serve in the development and dissemination of new technology applied to patient care, translational research related to improved methods of patient care, and enhance quality of care." (p17)

11. **Report of the Special Commission on Graduate Medical Education.** Commonwealth of Massachusetts, Executive Office of Health and Human Services. 2013.

"The Commission noted the role of academic medical centers in 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." (p30)

The Direct, Indirect, and Intangible Benefits of Graduate Medical Education Programs to Their Sponsoring Institutions and Communities

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Stanley M. Kozakowski, MD

Abstract

Declining reimbursement for graduate medical education (GME) as well as increasing hospital competition has placed the cost of GME in the spotlight of institutional administrators. Traditional hospital-generated cost center profit and loss statements fail to accurately reflect the full economic impact of training programs on the institution as well as the larger community. A more complete analysis would take into consideration the direct, indirect, and "intangible" benefits of GME programs. The GME programs usually have a favorable impact on the trainees themselves, the sponsoring institution, the local community, university sponsors and affiliates, and the greater community, and all of these areas need to be considered in the economic analysis. Complete analyses of programs often demonstrate very positive benefits to their sponsoring institutions that would not be recognized on simple cost center profit and loss reports. Studies in the literature that quantify the net economic benefits of GME programs are consistent in their favorable findings.

Introduction

Large teaching hospitals have traditionally been the setting for the major portion of the education of medical students and resident physicians. In today's dynamic and outpatient-centered health care system learners should be exposed to diverse patient populations and clinical problems in a range of settings. Unfortunately, economic pressures have called into question the economic viability of graduate medical education (GME) programs, especially those training primary care physicians, which rely heavily on ambulatory experiences.

In most hospitals and health systems, a member of the senior administrative staff is responsible for evaluating the institution's commitment to medical education. Yet it often falls to the residency program directors to identify and account for the costs and benefits of GME programs to their sponsoring institutions. The purpose of this review is to examine the impact of GME programs in a way that goes beyond the usual hospital revenue-expense reports, to consider instead elements that affect the institution and other constituencies. Only with a full understanding of this impact of GME can teaching institutions comprehensively assess the role and critical functions of their medical education programs.

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Background

Since the initiation of the Balanced Budget Act in 1997, federal reimbursement for GME has declined substantially.[1,2] In fact, it declined more than even medical educators anticipated. The Balanced Budget Act included provisions for decreasing the "multiplier" in the Medicare indirect medical education reimbursement to hospitals sponsoring GME programs. Few recognized, however, that the concomitant reduction in reimbursement for Medicare diagnosis-related groups resulted in a "double impact" that caused major reductions in federal support for GME.

Some specialty training programs are able to weather fiscal pressures better than others. Surgical training programs can generate substantial clinical income from surgical and consultative fees that may offset some of the lost federal support. In contrast, fiscal pressures likely have contributed to a significant loss of primary care training programs and positions. Since 1998, family medicine has lost 40 programs and 390 first-year resident positions, and general internal medicine has lost 25 programs and an estimated 865 first-year slots.[3] A study of family medicine programs that were forced to close in recent years showed

that more than 80% of the closures were primarily for financial reasons.[4]

To compensate for these losses, some GME programs have placed greater emphasis on the clinical services rendered by residents and faculty. This may tip the service/education balance away from the priority of education. Intense competition in the health care marketplace has made the "educational overhead" of teaching hospitals more apparent and put them at a competitive disadvantage in their marketplace. For community-based GME programs, narrowing margins have forced administration to look closely at all "cost centers," including the residency programs they sponsor.

A substantial problem for GME programs today is the reality that the typical hospital-generated cost center profit and loss statement fails to accurately reflect the full economic impact of the residency on its sponsoring institution, let alone to reflect its contributions to the patient-care community it supports.[5] And because few appreciate that it takes up to 2 years to start a new residency, the decision to close a GME program has long-lasting repercussions that cannot be easily or quickly reversed.[6]

Impacts

The impact of a GME program on its sponsoring institution can be examined from the perspective of direct, indirect, and "intangible" benefits.[5] Revenue and expense reports capture the direct financial benefits of a residency to its sponsoring institution. The indirect and intangible benefits are more expansive and therefore more difficult to identify.

Through their GME programs, sponsoring institutions become eligible for federal, state, and grant funds, such as Medicare direct and indirect GME reimbursement, Medicaid GME reimbursement, and Title VII grant funding.[7] In fact, in some situations the biweekly revenue from Medicare direct reimbursement is important in maintaining the institution's cash flow at various times of the year. Depending on the state in which the program is located and the payer mix of the sponsoring institution, additional funds may be available through the Disproportionate Share Hospital program or state line-item budgets. At the same time, direct financial accounting for GME often shows a considerable amount of "red ink."[8]

One area of benefit that has not been critically examined is the impact of GME programs on the medical liability/risk management costs of their sponsoring institutions. The authors could find no reliable documentation of this impact. Conventional wisdom might suggest that the risk management experience of teaching hospitals would be unfavorable because patients are cared for by novice physicians and therefore more medical errors would occur. In contrast to this stands the personal experience of the authors that the liability exposure of teaching hospitals may in fact be lower than that of nonteaching institutions. The attention to detail inherent in a setting where learners are present, where there is a focus on innovation, frequent use of current medical literature to guide clinical decision making, redundancy of supervision, and more frequent and thorough case reviews may contribute to a lower incidence of adverse occurrences. Malpractice insurance carriers and hospital system-risk managers are challenged by the authors to further investigate this phenomenon.

Indirect benefits, often in the form of secondary financial benefits from referrals that contribute to margins or spread fixed costs, as well as cost-avoidance through resident coverage of clinical services have been identified in peer-reviewed publications for more than 15 years.[9–12] Yet the challenge remains to identify and somehow quantify those intangible benefits imparted to institutions and communities that have been appreciated by medical educators for many decades.[13,14] As reflected by Osler[15] in 1903 (p. 50):

> "The work of an institution in which there is no teaching is rarely first class. There is not that keen interest nor the thorough study of the cases nor amid the exigencies of the busy life is the physician able to escape clinical slovenliness unless he teaches and in turn is taught by assistants and students. It is, I think, safe to say that in a hospital with students in the wards, the patients are more carefully looked after, their diseases are more fully studied and few mistakes made."

The GME programs have a positive effect on the quality of care. In 1994, Haesler[16] acknowledged that a benefit of participation in GME is "that a satisfied network of physicians has important implications … physicians who enjoy their work environment are more likely to retain employment," and tend to minimize the physician turnover rate. Haesler continues, "By participating in the exchange of information inherent in teaching, physicians open themselves up to review by their peers, students, and themselves. Such scrutiny often leads to improved performance." Gordon Moore, MD, director of teaching programs at Harvard Community Health Plan, has acknowledged: "Physicians learn when they teach. Students ask provocative questions. Physicians who teach engage in self-evaluations, self-assessment, critical reflection and self-improvement, all of which are key principles of total quality management."[16]

Numerous published articles have described quality differences between teaching and nonteaching hospitals, and there are at least 2 thorough review articles of this in the literature.[17,18] Although all available studies are observational and subject to methodologic critique, the findings support at least a modest trend toward better quality of care in teaching hospitals. The authors were not able to find any documentation of quality comparisons for teaching and nonteaching ambulatory settings. Studies

comparing quality markers including adjusted length of stay, fixed and variable costs, and resources used for inpatient teaching services, hospitalist teams, and community physicians, for example, demonstrate favorable comparisons.[19–21] With the growing availability of quality of care data and outcomes, particularly in outpatient settings and even with publicly available websites comparing institutions, future publications broaden the settings in which quality differences between teaching and nonteaching settings have been described.

Graduate medical education programs provide a favorable impact on at least 5 separate target levels. They include the residents themselves, the sponsoring institution, the local community, any affiliated academic health center or university sponsor, and the greater community and the nation. Each of these impact targets will be briefly addressed in turn.

1. Residents and Fellows

Graduate medical education programs have the opportunity to impact trainees beyond the biomedical knowledge and experience imparted through the residency curriculum. Because GME programs disproportionately serve disenfranchised and medically underserved populations, GME programs are one of the primary opportunities to instill in health professionals a social conscience and dedication to care for disadvantaged populations. More than 50% of this nation's health care "safety net" is provided by the GME training programs in university and community-based institutions.[22,23] From an institutional perspective, maintaining a commitment to the care of the poor and vulnerable is an important justification of "not for profit" status.

The favorable impact of GME programs on charitable-giving initiatives has not been studied, but it is a personal experience of the authors that potential donors to health care institutions react favorably to institutional efforts to train the health care providers of the future and to share with them the values espoused by that particular institution.

2. Sponsoring Institutions

Graduate medical education programs typically provide substantial support to educational functions beyond the residency and fellowship curriculum. Such support may include the continuing medical education program for the medical staff itself, educational support for nursing and allied health trainees, and the teaching of medical students. As discussed earlier, the total contributions support an improvement of overall quality of care in teaching institutions.

Resident physicians also provide broad institutional patient care coverage including inpatient and outpatient care, emergencies, Joint Commission-mandated rapid response teams, and acute and chronic health problem management. Providing such services in the absence of a residency program would entail hiring no less than 4 full-time physicians to provide around-the-clock coverage for the typical community hospital.

Trainees provide a useful opportunity for the introduction of new technology, given the increased comfort level of younger physicians with the use of electronic media and communications. Using residents to introduce, problem-solve, and polish clinical guidelines and pathways makes quality improvement activities substantially easier to accomplish.

Direct patient care services, including ambulatory teaching clinics, also expand the referral base and provide economic benefits to the sponsoring institution that have been well documented that those services expand/provide.[24,25] In addition, institutionally affiliated teaching clinics located in areas peripheral to the institution's primary catchment area can increase market share by bringing patients into that health system who might otherwise have gone elsewhere. Indirect revenue, often not credited to outpatient and affiliated teaching clinics, can include hospital admissions, utilization of hospital-based outpatient services, and referrals to local consultants who use the services of that institution. A study by Schneeweiss et al[9] demonstrated the so-called "multiplier effect" of a family medicine teaching clinic on one particular academic medical center. The data showed that for every $1 billed by the family physician faculty and residents, $6.40 was billed by the consultants and hospital diagnostic and therapeutic services. Woodcock,[10] Saultz et al,[11] and others[8] subsequently validated this finding.

Many institutions have come to appreciate that the capacity to retain residency program graduates within their health systems can substantially reduce recruitment costs for the facility. Surveys indicate that recruiting quality physicians to address patient care demands is a major concern for hospital management.[26] Dealing with the current and escalating physician shortage is now a top priority for most hospitals and health systems.[27] In this context, "growing your own" often is less expensive than paying recruitment firms for each physician sought. One study showed that the fixed costs alone for a modest-sized hospital physician recruitment department exceeded $160,000 per year.[28,29] Retaining program graduates also provides institutions with an individual of known quality who is already familiar with the local health system's procedures, resources, and facilities. In addition, teaching programs attract other physicians who seek the opportunity to work at the forefront of medicine.[30] This dynamic further reduces the cost of recruiting other specialists to the community.

3. Local Community

Training program graduates who stay in the local community and become active on the medical staff of their training institution support the institution itself, support

local consultants, use local facilities, provide access to care for the medically underserved, and provide overall enhancement of the patient base. Until the nation fully implements its plans to achieve universal health care access, GME programs will continue to provide much of the access to care for underserved and vulnerable populations of this nation.[22] Millions of dollars of free care are provided each year to disadvantaged individuals, patients with HIV and AIDS, victims of domestic violence, homeless persons, and refugees.

Teaching programs based in community hospitals provide their sponsoring institutions with specialty services not otherwise available in the community through the creation of teaching-specialty clinics, procedure clinics, and the inclusion of teaching consultants. They also bring local physicians continuing professional development opportunities such as ALSO (Advanced Life Support for Obstetrics) and EPEC (Educating Physicians in End-of-Life Care). Training-program outpatient services provide many direct services to the local community including access to flu shot clinics, school health, preparticipation physical examinations, community education services, nursing home support, emergency department follow-up, and support for the health care initiatives of the local public health department. These services also meet the needs of patients whose primary physicians are not local, such as providing allergy shots that were prescribed by physicians from other communities. Some training programs require residents to complete community service or education programs such as the community-oriented primary care projects commonly conducted in many family medicine residency training programs.

Community-oriented primary care projects sponsored by a training program frequently result in better health and lower health care costs. This can have a positive economic impact for the sponsoring institution, particularly if the population is indigent or participates in a managed care system, and can result in increased grant support and philanthropy and further benefit the sponsoring institution through expansion of the referral base.

Many community teaching hospitals have also discovered that their GME programs provide a convenient and cost-effective strategy for extending employee health services. Finally, a full accounting for the benefits of GME programs to the community should include the contributions made to the local community by the spouses, significant others, and extended family of the physicians-in-training, and the virtually inevitable positive contributions these professional families provide to their local communities.

4. University Sponsors and Affiliates

When GME programs are affiliated with an academic health center or university facility, added benefits are realized.[31,32] Graduate medical education programs, their trainees, and faculty often are major contributors to teaching medical students and other health professionals, including nurses and allied health providers. Similarly, the primary care base of a community teaching hospital not only supports the secondary referrals to its own institution, but the tertiary and quaternary referrals to regional health centers and university facilities. Many members of the community teaching faculty generate educational and research dollars in the form of grants and contracts, and they provide venues for innovative programs including community teaching clinics, rural outreach initiatives, and support for telemedicine projects to remote settings.

5. Benefits to the Greater Community and Nation

Graduate medical education programs generate physicians who are conversant with the resources and procedures of their community. Graduates settle near their former training institutions or in adjacent areas and begin practice already facile in the knowledge and pragmatic use of local and regional health care resources to the ultimate benefit of the community populations they serve. For example, the health of a community's children can be improved through school-based educational initiatives. At the regional and national level, these graduates provide the workforce to replace retiring physicians and promote community growth through infrastructure support.

The impact of training programs can be quantified in the economic benefits to the community when residency program graduates decide to settle and practice locally. For example, in 2002 the Center for Health Policy Research & Development of the University of Oklahoma documented that the placement of a single primary care physician in a community resulted in a direct economic benefit to that population of approximately $1 million per year of practice.[33]

Residents and fellows, faculty, and program graduates enhance the public relations value of their sponsoring institution through community agency participation, support for health education programs to schools and other community organizations, and through satisfied patients that result in positive community relations and a favorable institutional image. Community involvement by faculty and graduates in community service organizations and local politics continue their favorable impact on the communities surrounding the training institution.[34–37] Linkages with community health centers can promote preventive care, coordinate resources for patients, and ultimately decrease morbidity and mortality. Patient care services by physicians-in-training also support public health and social services through their integration with clinical education. Finally, the long-term benefits to society from the clinical translational research and scholarly contributions of trainees and teaching faculty must be acknowledged despite the inherent difficulty in quantifying that impact directly.

Conclusion

The community benefits of GME programs extend far beyond the walls of the teaching hospital. Through service to individuals and the community at large, these programs contribute positively in ways far beyond what may be found on the typical hospital revenue and expense report. A full appreciation of the breadth and depth of benefits these programs render to their institutions and communities provides an important perspective for planning, resource allocation, innovation, and quality impacts within the institutions that sponsor them.

The authors recognize the importance of periodically evaluating all programs, including GME. Undoubtedly, there are situations in which a residency program no longer fits the sponsoring institution's strategic vision. However, when dire financial circumstances suggest that a residency no longer seems sustainable, it may be important to consider the indirect economic benefits and market-based replacement costs for services the residency program provides. Our collective experience has been that the strategic review of a GME program often is based on direct profit and loss assumptions. Due diligence requires that the calculations include:

1. Direct revenue and expenses, including full credit of federal and state GME support.
2. Analysis of indirect revenue and expenses associated with the program, with some attempt to analyze indirect contribution margin and the value of care to the poor and vulnerable as part of an institution's community benefit contribution.
3. Making defensible assumptions about the intangible benefits of the residency, and comparing them to the intangible benefits of other programs sponsored by the hospital.

It is our experience that a complete analysis often demonstrates a very positive benefit of GME to the sponsor's environment, although the direct subsidy may initially appear substantial. This impression is supported by several studies, but there are gaps in the evidence and further investigation is warranted.[38,39] Studies that quantify the net/net economic benefit of GME programs to their sponsoring institutions, although limited, are consistent in their favorable findings. More study is needed to further quantify these benefits so that the administrators of sponsoring institutions may better understand the magnitude of the contributions of their GME programs. We hope that this review will spur further research and focused discussion regarding the impact of GME programs on their sponsors and communities. Only through a comprehensive understanding of the breadth, depth, and magnitude of the favorable benefits that a GME program brings to its sponsoring institution and community can health care planners adequately prepare to meet patient care needs in our present turbulent environment, and for the uncertain future.

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Determining the True Value of a Family Practice Residency Program

This financial model enables directors to begin to quantify the intangible contributions that traditional financial reports don't consider.

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Fam Pract Manag. 2000 Jun;7(6):39-42.

These are financially challenging times for residency programs. Many are feeling the impact of managed care, reduced Medicare reimbursement for graduate medical education and the Balanced Budget Act of 1997, which has narrowed, and in some cases even eliminated, hospitals' operating margins.

Family practice residency programs are particularly vulnerable as a result of these economic changes. More than 80 percent are based in community hospitals, where many are the only graduate medical education program generating revenue. They typically serve disenfranchised patient populations and have little access to revenues from “high-reimbursement” surgical procedures and specialty consultations that, for example, are available to surgical residency programs. Unstable patient populations, productivity pressures that challenge teaching time and high operating expenses further strain already fragile budgets.

With financial resources declining, residency programs are under increasing pressure from sponsoring institutions and their governing bodies to show a positive contribution to the bottom line.

Determining true value

While traditional profit-and-loss statements do a good job of quantifying revenue and expenses generated by teaching and patient care activities, they fail to recognize the indirect and intangible benefits of a residency program, such as the contribution that a program makes to the “mission, vision and value” of the sponsoring institution and the money the sponsoring institution saves by having to recruit fewer physicians.

KEY POINTS:

- Residency program directors are being increasingly pressured by their sponsoring organizations to show a profit.
- Directors need a financial model that encompasses all of the revenue and expenses generated by teaching and patient care as well as the more intangible contributions.
- The financial model presented here encapsulates the true costs and broad benefits of a residency program. Because it is data-driven, it will also withstand a financial audit.

To survive in the current economic climate, residency directors must show the true worth of their programs. This requires a new financial model with the ability to capture and quantify these indirect and intangible benefits. The model must also be data-driven so that it can withstand a financial audit; comprehensive enough to meet the varying needs of residency programs, hospital finance departments and the governing boards of sponsoring institutions; and generic enough to be applicable in a majority of training settings.

While we still consider the model we've developed to be a work in progress, we've found it to be an effective starting point for encapsulating the true costs and broad benefits that a residency program offers its sponsoring organization and the local community.

The model

Our model began as a simple budgeting spreadsheet developed for the AAFP's Residency Assistance Program (RAP) workshop titled “Reality-Based Budgeting.” We later used it in a budgeting exercise for the AAFP's Fundamentals of Management course, where it evolved to include a more detailed perspective of cost accounting and revenue source identification. We reformatted it and further refined it through the RAP “Focused Financial Issues” consultation. Reduced Medicare reimbursement and other environmental pressures prompted us to further refine the model in order to identify any and all positive financial contributions made by residency programs.

The financial analysis model

Traditional profit-and-loss statements account for the direct costs and revenue generated by a family practice residency program but fail to recognize the other valuable contributions that a residency program makes to its sponsoring institution. We've created a new model that better captures the value of these more elusive contributions.

To apply the model, simply assign a dollar amount to each of the descriptors. Many of the numbers you'll need can be obtained from financial reports from the previous fiscal year. Others, such as “revenue adjustment” and “intangible revenue,” will need to be estimated or calculated with the help of your program administrator or your institution's financial department. Not all items will apply to all residency programs.

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Most program directors will be familiar with the financial terms listed in the model. Those who aren't should consider asking for assistance from their institution's financial department or should seek additional training in residency finance. [See the educational resources and additional reading.]

To use the model, plug in the corresponding dollar amounts next to each applicable line item. Many of the figures, especially direct revenue and expenses, can be found in standard hospital cost accounting reports and billing and collections data (traditional profit-and-loss statements) from family practice centers. Some of the numbers for indirect revenue cost avoidance and expenses are more difficult to obtain because they have to be estimated. This requires working with the program administrator or the institution's financial department to determine agreed-upon values for these categories. It is especially difficult to quantify intangibles. The best way may be to analyze them in terms of “what happens if they go away.”

Information about indirect revenue, cost avoidance and expenses typically can be gleaned from the following sources:

- Annual hospital finance reports to government entities (e.g., a Medicare cost report);
- Patient accounting systems that separately identify cases involving residents (e.g., the marginal contribution to fixed costs through program admissions to inpatient units);
- Hospital data that can be used to calculate cost savings (e.g., the average cost per case avoided by using residents as surgical assistants);
- Program-specific tracking systems (e.g., referrals to local consultants resulting in utilization of sponsoring institution's facilities or average revenue received from admissions by local surgeons and other specialists);
- Other reports that can reliably be used to support estimates (e.g., average marginal contribution to fixed costs through local and regional referrals to specialists that result in inpatient admissions, outpatient procedures or ancillary services provided within the system).

In addition, doing a little research (e.g., determining the cost of recruiting a primary care physician to the institution) can also yield valuable information.

Caveats

Although we've attempted to be as comprehensive as possible as we've developed this model, there are some significant caveats. First, not every institution has true cost data available. This will make it difficult for some programs to calculate indirect benefits. In addition, many primary care practices, particularly those in markets heavily penetrated by managed care, operate with an acknowledged deficit that is absorbed by a larger “system.”

Educational resources

The following programs are designed for directors of family practice residencies interested in strengthening their financial management and leadership skills.

The American College of Physician Executives offers a broad range of educational seminars for physicians who have just begun to explore a management career as well as for the seasoned physician executive. More information is available at http://www.acpe.org/education/index.aspx.

The National Institute for Program Director Development provides new directors with the foundational skills they need to understand the financial realities of running a residency program. The institute includes three structured learning sessions, an advisorship with an experienced program director, and a longitudinal project. More information is available at http://www.afmrd.org/i4a/pages/index.cfm?pageid=3319.

The Residency Assistance Program holds an annual workshop for faculty and staff of family practice residencies and also offers a “Focused Financial Issues” consultation to help program directors and administrators improve their programs' financial statements and develop strategies for sound fiscal management. More information is available at http://www.aafp.org/rap.

Also, because this model doesn't separate the family practice center from the residency program, it can't be used to compare the family practice center with other local clinical facilities. In fact, very little data has been published comparing the financial deficits incurred by a residency family practice center with those of family

practice offices in the same market. This is an area that could clearly benefit from additional investigation.

A final word

As experienced teachers and program directors ourselves, we've recognized the need for a financial model that incorporates all of the contributions residencies make to their sponsoring institutions and local communities. In fact, some of the driving forces that precipitated the creation of the model were actual problems posed to us by program directors attending our workshops and presentations.

In these challenging times, every family practice residency director should be working toward identifying *all* that a residency program contributes to its sponsoring organization and local community. Relying solely on profit-and-loss statements to determine the value of a residency program is an inappropriately narrow point of view and a potentially costly mistake that should be avoided whenever possible.

Additional reading

"Assessing Primary Care's Contribution to Centers." Woodcock EW. *Medical Group Management Journal*. 1999;46(2):14–18,20–22.

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“The Economic Impact and Multiplier Effect of a Family Practice Clinic on an Academic Medical Center.” Schneeweiss R, Ellsbury K, Hart LG, et al. *Journal of the American Medical Association*. 1989;262(3):370–375.

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COMMENTS

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The Economic Impact and Multiplier Effect of a Family Practice Clinic on an Academic Medical Center

Ronald Schneeweiss, MD; Kathleen Ellsbury, MD, MSPH; L. Gary Hart, PhD; John P. Geyman, MD

Academic medical centers are facing the need to expand their primary care referral base in an increasingly competitive medical environment. This study describes the medical care provided during a 1-year period to 6304 patients registered with a family practice clinic located in an academic medical center. The relative distribution of primary care, secondary referrals, inpatient admissions, and their associated costs are presented. The multiplier effect of the primary care clinic on the academic medical center was substantial. For every $1 billed for ambulatory primary care, there was $6.40 billed elsewhere in the system. Each full-time equivalent family physician generated a calculated sum of $784 752 in direct, billed charges for the hospital and $241 276 in professional fees for the other specialty consultants. The cost of supporting a primary care clinic is likely to be more than offset by the revenues generated from the use of hospital and referral services by patients who received care in the primary care setting.

(*JAMA*. 1989;262:370-375)

THE 1971 comprehensive Health Manpower Training Act established a federal initiative to emphasize and support primary care training.[1] In response, many community and university hospitals developed family practice residency training programs. The great majority of these continue to train family practice residents. The training programs are required to have an ambulatory clinical teaching site that is usually affiliated with the sponsoring institution.[2] These affiliated teaching clinics generally refer patients to their sponsoring hospitals for inpatient admissions or to consultants on the medical staff for specialty services. In most academic centers, the sponsoring hospital is also used for outpatient laboratory, radiology, and other diagnostic services.

In the United States, hospitals depend on patient referrals and admissions to ensure their economic viability. In the 1980s, multiple forces, including cost-containment measures by the federal government, with the introduction of diagnosis related groups for the reimbursement of inpatient care,[3] have fueled interhospital competition. In the face of this competition, the need for hospitals to increase their primary care referral base has become more apparent.

It has long been speculated that primary care referrals have a substantial impact on a hospital and health care system.[4] In a recent article, Glenn et al[5] have demonstrated the multiplier effect of referrals from rural primary care practices on a university medical center. They showed that the average referral resulted in approximately $3000 worth of hospital charges and professional fees. However, we are unaware of any previous study that has described the overall cost of care and the economic impact that a primary care patient population has on an academic center.

The main objective of this study is to determine the overall economic impact of a primary care clinic on the sponsoring tertiary care medical center. Additional questions considered include the following: (1) What proportion of the charges generated are the result of care provided in the outpatient setting as opposed to the inpatient setting? (2) What is the distribution of and what are the charges for specialty consultations from the primary care center? (3) To what extent does patient age affect the cost of care?

METHODS

Patients who receive care at the University Hospital in Seattle, Wash, are registered on the hospital computer at the time of their first visit. Those patients who received care at the Family Medical Center (FMC) are specifically identified as registered FMC patients both on the computer and on their hospital card. The medical services provided at the University Hospital and the associated charges for all patients registered with the FMC were studied for a 1-year period between February 1, 1986, and January 31, 1987.

The FMC was established in 1971 and is the teaching practice clinic for the 15-physician faculty in the Department of

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Family Medicine and the 18 residents in the University Hospital family practice residency program. All of these physicians work part-time in the FMC, varying from 2 to 4 half days a week of practice. The average annual practice time for these physicians in the FMC is the equivalent of approximately five full-time equivalent family physicians in the ambulatory setting.

The FMC itself is a 614-m^2 facility with 14 examining rooms, which is physically located in the University Hospital, immediately adjacent to the main lobby. There are approximately 8000 active registered patients.

The data for this study were obtained from the following two sources: (1) the University Hospital computer system, which bills for all outpatient and inpatient hospital charges, and (2) the Association of University Physicians (AUP) computer system, which bills separately for the professional fees charged by the faculty attending physicians. The sum of the charges from these two sources was calculated.

During the study period, there were 224 service centers at the University Hospital. These were grouped by the investigators into 19 categories (Table 1), which were further aggregated into six broad study groups that included (1) the FMC, (2) other outpatient clinics and emergency departments, (3) inpatient services, (4) laboratory and pathology, (5) radiology, and (6) other ancillary services.

Each of these service centers provides a certain set of services. The patient, or the patient's insurance, is billed both a University Hospital charge and, where appropriate, an AUP professional fee for services rendered. Some charges were identified in the hospital computer as having been ordered by the diagnostic or ancillary center that provided the service itself. In those cases where the ordering service center was not specifically identified, it was assumed to be an outpatient request, since it is more likely that all inpatient charges would be so designated for billing purposes. The unassigned services accounted for 0.4% of the laboratory and pathology charges ($2331), 22.9% of the radiology charges ($126 385), and 45.3% of the ancillary charges ($125 623). The sum of these unassigned charges amounted to 4.2% of the total charges.

The AUP computer system bills for professional fees generated by the 18 medical school departments, which include 94 billing divisions. All the AUP divisions were allocated to the same 19 categories as the University Hospital service centers (Table 1). Outpatient and inpatient charges are so indicated in the professional fee database. The total outpatient AUP charges for radiology ($110 778), laboratory or pathology ($11 299), and other services ($5680) were divided proportionately between the FMC, emergency department and specialty clinics, and unassigned ordering station, based on the percent distribution of hospital charges for these services known to have been ordered by them. These outpatient AUP fees accounted for 2% of the total charges.

Only a small portion of pediatric emergency and specialty care charges for FMC patients are included, since the University Hospital computer captures only the general pediatrics consulting clinic and inpatient services provided for newborn patients (including intensive care). Most other specialty pediatric consultations and inpatient services are provided at the nearby Children's Hospital, which uses a separate computer system. Those data were not accessible for this study. Outpatient pharmacy costs are not included, and patient visits for medical services outside of the University Hospital system are not available and are also not reported.

Thirty percent of the FMC patients were enrolled in a prepaid, capitated insurance plan. This plan required that all specialty referrals or admissions had to be authorized by the primary care provider, including referrals for mental health services and eye refractions. Patients not enrolled in a prepaid, capitated plan could be self-referred for specialty consultation. These latter patients could also be secondarily re-

Table 1.—Allocation of Service Centers to Study Groups

Study Group	Service Center Categories Included
Family Medical Center	Family Medical Center
Other outpatient clinics	Medical specialties, surgical specialties, obstetrics and gynecology, psychiatry, general pediatrics, miscellaneous specialties, and emergency department
Inpatient	Intensive care, all general inpatient wards, inpatient pharmacy, ambulatory surgery, and supplies and hospital administration
Laboratory and pathology	All laboratory and pathology service centers
Radiology	Radiology and nuclear medicine
Other ancillary services	Physiotherapy, nutrition, rehabilitation, electrocardiography, and other diagnostic and treatment services

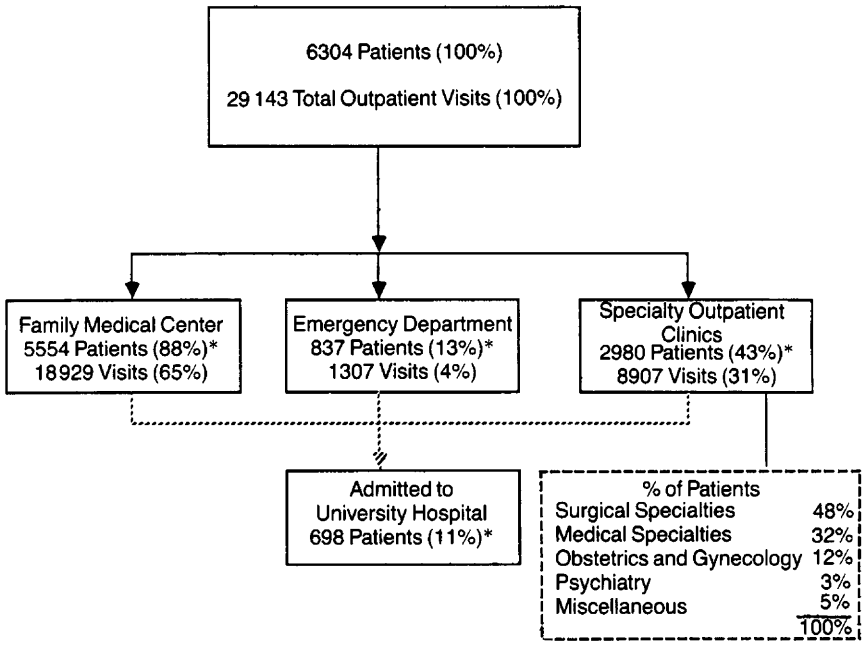

Fig 1.—Distribution of registered Family Medical Center patients who used services at the University Hospital in Seattle, Wash, by location of service, between February 1986 and January 1987. Asterisk indicates that the percent of patients exceeds 100% since patients could be seen in multiple sites.

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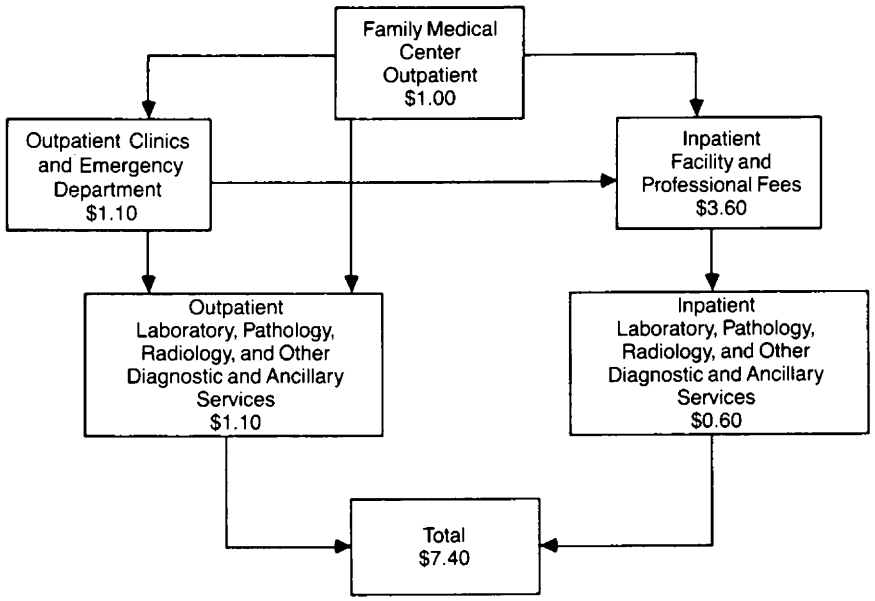

Fig 2.—Relative charges by service center for registered Family Medical Center patients in Seattle, Wash, between February 1986 and January 1987. For every $1 billed in the outpatient Family Medical Center, there is $6.40 of billed charges generated elsewhere in the system.

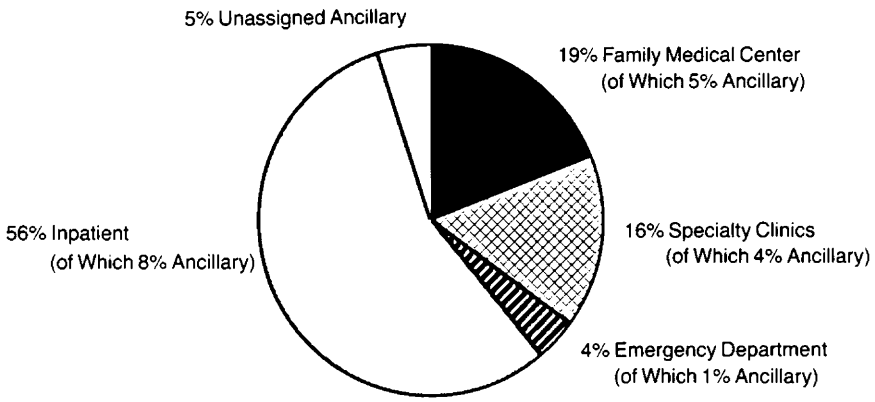

Fig 3.—Distribution of total charges for registered Family Medical Center patients in Seattle, Wash, between February 1986 and January 1987. Total billed charges, $6 105 826.

ferred to another specialty or admitted to the hospital without the involvement of the primary care provider.

RESULTS

Between February 1, 1986, and January 31, 1987, there were 6304 FMC patients who received outpatient and inpatient medical care at the University Hospital. These patients made a total of 29 143 outpatient visits to all the University Hospital ambulatory clinics (Fig 1). Of all the registered patients, 60% were female. Patients 65 years of age and older accounted for 7.3% of the registered patients.

There were 5554 patients (88%) seen in the FMC one or more times for a total of 18 929 FMC visits. There were 2980 patients (43%) who were seen at least once for specialty consultation. These included primary referrals from the FMC, self-referral, or secondary referrals from the specialty clinics. The consultants most frequently needed by these patients were in the surgical specialties (48% of referrals), followed by the medical specialties (32%), obstetrics and gynecology (13%), and psychiatry (3%).

There were 837 patients (13%) who received care in the emergency department, where they were largely attended to by family medicine residents and faculty. Except in life-threatening cases, the emergency department will page the family practice resident who is on call to attend to patients registered with the FMC who visit the emergency department. There were 698 patients admitted (11%), including approximately 180 obstetric patients and 150 newborn patients. This excludes a small number of nonnewborn acute and elective pediatric patients who were admitted to the Children's Hospital in Seattle. There are estimated to be approximately 10 to 15 such admissions annually.

The total annual billed charges for all the FMC patients who received care at the University Hospital were more than $6 million. This represented 4.2% of the total University Hospital billings and 2.7% of the AUP professional fees billed during the same period. For every $1 billed for FMC outpatient services, there was $6.40 of billed charges generated elsewhere in the University Hospital system as a result of referrals, admissions, or diagnostic services. This included $0.40 for family medicine inpatient professional fees (Fig 2).

The facility and professional charges for medical care provided for patient visits in the FMC represented 13.5% of the total billed charges. An additional 5.2% of the charges was for ancillary services, which included outpatient diagnostic (eg, laboratory, pathology, radiology, and electrocardiography) and various other treatment services (Fig 3). Billed charges for specialty clinic services accounted for 12.1% of the total charges, with an additional 3.9% as a result of associated ancillary services. The consolidated facility and professional fees for emergency department care accounted for 2.8% of the total charges and 1.4% of the ancillary services.

The overall annual visit rate per patient was 4.6 visits (Table 2). Patients seen in the FMC averaged 3.4 visits in that setting, while for those who were seen for surgical or medical consultation there were 2.4 and 2.5 visits per patient, respectively. In contrast, the 85 patient referrals to psychiatry resulted in an average of 13.1 psychiatric visits per patient per year. This does not include

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Table 2.—Outpatient Charges for Registered Family Medical Center Patients Between February 1986 and January 1987

Outpatient Clinic	No. of Visits per Patient Seen by Clinic	No. of Visits per Registered Family Medical Center Patient (N=6304)	Charges per Visit, $			Charges per Patient, $		
			Fees*	Ancillaries†	Total	Fees*	Ancillaries†	Total
Family Medical Center	3.4	3.0	44	17	**61**	149	57	**206**
Surgical specialties‡	2.4	0.6	73	19	**92**	179	45	**224**
Emergency department	1.6	0.2	130	65	**195**	204	102	**306**
Medical specialties	2.5	0.3	91	36	**127**	229	92	**321**
Obstetrics and gynecology	3.3	0.2	64	53	**117**	215	117	**332**
Psychiatry§	13.1	0.2	73	1	**74**	949	19	**968**
Miscellaneous‖	6.2	0.1	148	53	**201**	914	330	**1244**
All clinics	...	**4.6**	60	32	92	286	104	390

*Includes facility charges and professional fees.
†Includes laboratory, pathology, radiology, and other diagnostic and treatment services.
‡Includes ophthalmology and eye refractions (560 patients with 734 visits).
§Does not include counseling provided in the Family Medical Center (140 patients with 507 visits).
‖Includes rehabilitation medicine, radiation oncology, and pain clinic.

Table 3.—Distribution of Specialist Consultations by Family Medical Center Patients

Specialty	No. (%) of Consultations	% of Referrals (Curtis et al[11])
Ophthalmology*	560 (18.8)	11.3
Obstetrics and gynecology	378 (12.7)	15.1
Cardiology	354 (11.9)	4.1
Orthopedics	270 (9.1)	6.0
Otolaryngology	226 (7.6)	9.5
General surgery	206 (6.9)	6.0
Dermatology	146 (4.9)	4.6
Urology	125 (4.2)	3.2
General medicine	92 (3.1)	...
Psychiatry	85 (2.9)	12.5
Gastroenterology	83 (2.8)	...
Rehabilitation medicine	80 (2.7)	...
Neurology	67 (2.2)	...
Allergy	60 (2.0)	...
Radiation oncology	49 (1.6)	...
Endocrine	48 (1.6)	...
Other†	151 (5.1)	12.6
Total	**2980‡(100.0)**	...

*Includes eye refractions, which accounted for 95% of the ophthalmology consultations.
†Includes (number of patients) arthritis (26), respiratory (25), oncology (22), plastic surgery (21), neurosurgery (17), nephrology (15), pain clinic (13), and hematology (12).
‡The 2980 patients made 8907 visits to the specialty clinics.

the 140 patients who were seen for 507 visits to the behavioral science counselors on the FMC staff, who saw patients for initial examination or short-term counseling. Referrals to mental health professionals outside the University Hospital are not included in this study. These outside referrals account for an estimated 30% of the mental health referrals from the FMC.

Referrals to the various specialties generated health care costs at rates that varied by specialty. These costs included the facility charges, professional fees, and the ancillary diagnostic and treatment charges (Table 2). The miscellaneous specialties category (including rehabilitation medicine, radiation oncology, and the pain clinic) were the most costly in terms of charges per visit, as a result of higher professional and facility fees as well as higher charges for diagnostic and ancillary treatment services needed. The average referral to psychiatry resulted in a per visit charge of $74 but a total annual cost of $968 per patient. This contrasted with other medical and surgical specialties with a much lower visit rate following a referral and, as a result, a lower total charge per patient in the outpatient setting. The FMC had the lowest per visit charge ($61) and the lowest total charge per patient ($206). The emergency department was a relatively expensive ambulatory setting, with a high per visit fee of $130 dollars, excluding the ancillary diagnostic and treatment charges.

The relative distribution of specialist consultation is presented in Table 3. The most common surgical specialty referral was to ophthalmology (95% of these were for eye refractions), followed by orthopedics, otolaryngology, and general surgery. Cardiology and dermatology were the medical specialties most frequently consulted.

The 698 inpatient admissions resulted in 56.1% of all billed charges for FMC patients. This includes 48.1% attributed to the hospital facility charges plus professional fees and 8.0% for diagnostic and ancillary services (Fig 3). The high intensity of services provided to this relatively small number of inpatients is reflected in the fact that these patients accounted for 43% of all laboratory and pathology charges, 23% of all the radiology charges, and 39% of the other diagnostic and treatment services provided to the FMC patients.

Patients 65 years of age and older represented 7.3% of all registered patients but accounted for 14.0% of all admissions (Fig 4). They also used a relatively higher proportion of the outpatient (10.8%) and the emergency department services (13.2%).

COMMENT

To what extent should hospitals, and especially teaching hospitals, be concerned with creating and possibly expanding their referral base? Often, this question is approached in the absence of good data to assess the potential impact of such a decision on the overall medical system involved.

This study focuses on the economic impact of a particular university hospital-based primary care family practice clinic on the parent tertiary care academic medical center. The University Hospital provides a wide range of comprehensive services, and the results therefore reflect, to a large degree, the overall process of care and the resources necessary to meet the medical needs of this primary care population. Since the objective of the study was to determine the economic impact on the sponsoring

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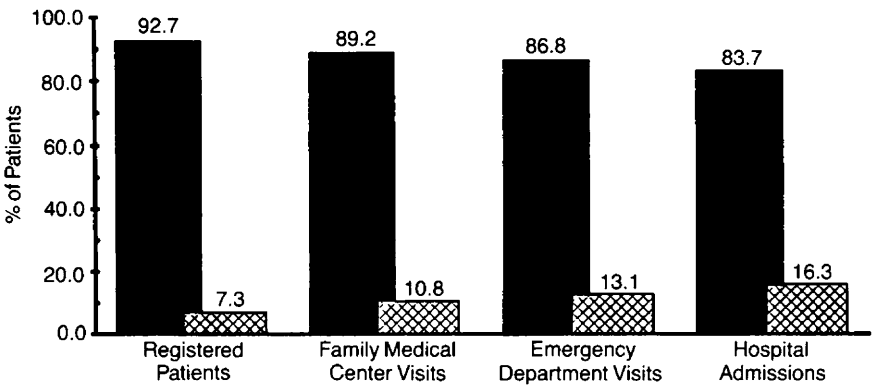

Fig 4.—Visits and hospital admissions for registered Family Medical Center patients by age in Seattle, Wash, between February 1986 and January 1987. Solid bars indicate patients younger than 65 years; crosshatched bars, patients aged 65 years or older.

institution, the analyses did not include those services provided outside the University Hospital, including outpatient pharmacy, self-referrals, pediatric specialty referrals, and nonnewborn-related pediatric inpatient costs. These would represent, however, only a small proportion of the total costs for this patient population.

The age distribution of the patients in the FMC reflects the practice trend of more recently graduated family physicians as described by Rosenblatt et al[6] in a national study of family practice. The FMC patients are younger than the general population in King County, where Seattle is located, with relatively fewer patients 65 years of age and older (7.3% vs 10.2%).[7] The younger patient age in family practice residency programs has been described elsewhere.[8] Since patients 65 years of age and older have more chronic disease and require more resources, the relative patterns of care and associated costs, as described in this study, may be different than would be found in practices that serve older patient populations.

The primary care clinic and its patients were a substantial source of revenue to the hospital and its specialty services. The multiplier effect is the result of the use of the hospital facilities; specialty clinics; and diagnostic, treatment, and inpatient services. Charges that resulted from specialist consultations and admissions to the hospital were responsible for 81% of the total billings (Fig 3). Another way of expressing this multiplier is the ratio of primary care charges to other charges. For every $1 billed for outpatient services in the FMC, there was $6.40 of billed charges for services provided elsewhere in the system. Approximately two thirds of this amount ($4.20) resulted from the inpatient services provided to 11% of the patients who required admission.

At the time of this study, the FMC had approximately five full-time equivalent family physicians. After deducting the facility charges and professional fees for services provided in the FMC itself plus the family medicine inpatient professional fees, each full-time equivalent family physician accounted for $784 752 in hospital charges for the hospital. There was an additional $241 276 in billings for professional fees by the other University Hospital specialty consultants. By comparison, Hawkins[9] estimated $350 000 of direct revenues to a hospital attributed to one full-time equivalent family physician and double that amount as a result of specialist referrals.

Patients 65 years of age and older required proportionately more inpatient and emergency care and used more resources than younger patients. Overall, the costs per registered patient 65 years of age and older were approximately three times higher for outpatient services and six times higher for inpatient care as compared with patients younger than 65 years (R.S., unpublished data, 1987). The increased cost of providing care for the elderly has been described by Cooper and Piro,[10] but not relative to younger patients in the same medical setting. They calculated that the costs of medical care for patients 65 years of age and older were approximately three times that for patients aged 19 to 64 years of age and six times that for patients younger than 19 years. This has substantial implications for institutions involved in negotiating future capitated contracts for Medicare patients. The increased costs of care for the "older" vs the "younger" elderly has been addressed by other studies,[11] with more resources expended on patients in the last 2 years of life.[12]

There were 750 patients who were seen at least once in the specialty clinics but were not seen in the FMC during the study period. It is very likely that the majority of these patients had been seen in the FMC at least once during the year that preceded their visit for that specialty consultation. This observation is based on the fact that patient-held hospital cards are renewed annually when they visit, and the computer registration is updated accordingly. If they had ceased to be FMC patients, that designation would have been deleted from the computer at that time. Certainly, a small proportion of these patients may not in fact regard themselves as FMC patients; however, this is unlikely to change the results to any great degree.

The consultation frequency (number of consultations as a proportion of primary care visits) was 1 consultation for every 8.4 visits to the FMC. A recent study by Curtis et al,[13] in a comparable university medical center setting, found a referral frequency of 1 of every 11 primary care visits in the year that followed the introduction of a health maintenance organization (capitated health insurance plan) program in 1986. This difference in consultation frequency vs referral frequency may reflect the more comprehensive capture of all specialty consultations in this study that included self-referrals, secondary referrals, and patients who receive ongoing specialty care. The actual referral rate from the FMC could not be determined from the data available.

The frequency distribution of FMC patient consultations follows the pattern described in studies of referrals from family practice,[14,15] but with a relatively higher proportion of patients referred to cardiology. This probably reflects the particular mix of patients attracted to the university hospital setting because of the services available there. The high rate of referrals to ophthalmology was accounted for largely by eye refractions, as required by the prepaid insurance plan in which 30% of the FMC patients were enrolled.

Among the various sites of care in a tertiary care center, the primary care office setting is the least costly, partly because more patients in that setting have less complicated problems and partly because of a lower intensity of care. Considering only the facility charge and professional fee, the prima-

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ry care office is approximately one third to one half less costly when compared with other specialty clinics and approximately two thirds less costly than the emergency department setting. This has significant implications for the planning of health care provision, especially in capitated, prospective payment health insurance plans. Strategies to reduce cost in a prepaid plan could include the provision of expanded primary care services and extended hours of service in the primary care setting, thereby limiting the use of the more costly emergency department. This would clearly apply only to those patients who could appropriately be seen and treated in the less resource-intensive primary care setting.

Outpatient mental health referrals are relatively costly, and it is not surprising that these are usually only partially covered by health insurance plans. Including on-site mental health services in the primary care office for initial examinations and short-term counseling is a cost-effective strategy, especially for prepaid insurance plans. This also has the advantage of improving communication with the primary care provider.[16,17] Other frequently used specialty services could be paid under special contractual or capitation arrangements. This was a strategy proposed by Moore et al[18] in their analysis of the failed Safeco prepaid insurance plan. Since some referrals may be discretionary, these findings emphasize the importance of the role of the primary care provider in controlling costs.

As expected, the costs for inpatient care were high, representing 56.1% of total charges billed. This percentage probably underestimates the proportion of charges that arose from inpatient care, since at least some of the unassigned radiology and ancillary services occurred in an inpatient setting but were considered as outpatient services in this study. The magnitude of these inpatient costs, considering that only 11% of patients required admission, is substantial. The extent to which these costs can be controlled by the involvement of a primary care case manager is beyond the scope of this study but is certainly of interest as a topic for further research.

The rapidly increasing number of prepaid, capitated, managed health care insurance plans makes it essential that academic medical centers have available and accessible primary care resources. This is all the more important since most of these plans require patients to have an identified primary care provider. The FMC has been responsible for providing primary care to at least three fourths of all the managed-care patients at this university center. The remainder are seen in the general medicine and general pediatrics clinics, as well as obstetrics and gynecology, where a few of the physicians are designated as primary care providers. This has introduced a new dynamic into the relationship between primary care and specialty physicians in academic medical centers. It has certainly emphasized the increasingly important role of primary care in maintaining the referral base for the specialty consultants.

It is unrealistic to expect that a family practice clinic will, by itself, be a significant source of revenue to a large university hospital. In fact, in the case of residency training programs, the teaching clinic will probably need to be subsidized. The cost of supporting such a clinic is more than likely to be offset by the revenues gained from use of the hospital diagnostic and treatment facilities either by the ambulatory family practice center itself, by outpatient specialty consulting services, or from hospital admissions. The real costs and benefits to an institution of supporting a primary care residency training program should be considered in the light of the multiplier effect described in this study.

The interrelationship and interdependency of primary care with other specialty consultants deserves further exploration, as academic centers face the challenge of the changing and increasingly competitive medical care environment. The primary care providers in academic settings are faced with balancing their desire to provide quality care at low cost with the need to be responsive to the sponsoring institution by using often more expensive diagnostic and specialty services.

This study presents some objective charge data concerning a particular primary care clinic and its patients in an academic center. The patterns of referrals and relative costs of care in the various outpatient and inpatient settings described herein can be useful in planning the health care services needed for a primary care population, not only for academic centers elsewhere, but for other health care organizations.

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ORIGINAL ARTICLES

Association of Resident Coverage with Cost, Length of Stay, and Profitability at a Community Hospital

Daniel Shine, MD, Sumbul Beg, MD, Joseph Jaeger, MPH, Dorothy Pencak, MBA, Richard Panush, MD

OBJECTIVE: **The effect of care by medical residents on hospital length of stay (LOS), indirect costs, and reimbursement was last examined across a range of illnesses in 1981; the issue has never been examined at a community hospital. We studied resource utilization and reimbursement at a community hospital in relation to the involvement of medical residents.**

DESIGN: **This nonrandomized observational study compared patients discharged from a general medicine teaching unit with those discharged from nonteaching general medical/surgical units.**

SETTING: **A 620-bed community teaching hospital with a general medicine teaching unit (resident care) and several general medicine nonteaching units (no resident care).**

PATIENTS: **All medical discharges between July 1998 and February 1999, excluding those from designated subspecialty and critical care units.**

MEASUREMENTS AND MAIN RESULTS: **Endpoints included mean LOS in excess of expected LOS, mean cost in excess of expected cost, mean payments, and mean profitability (payments minus total costs). Observed values were obtained from the hospital's database and expected values from a proprietary risk adjustment program. No significant difference in LOS between 917 teaching-unit patients and 697 nonteaching patients was demonstrated. Costs averaged $3,178 (95% confidence interval [CI] ± $489) less than expected among teaching-unit patients and $4,153 (95% CI ± $422) less than expected among nonteaching-unit patients. Payments were significantly higher per patient on the teaching unit than on the nonteaching units, and as a result, mean profitability was higher: $848 (95% CI ± $307) per hospitalization for teaching-unit patients and $451 (95% CI ± $327) for patients on the nonteaching units. Teaching-unit patients of attendings who rarely admitted to the teaching unit (nonteaching attendings) generated an average profit of $1,299 (95% CI ± $613), while nonteaching patients of nonteaching attendings generated an average profit of $208 (95% CI ± $437).**

CONCLUSIONS: **Resident care at our community teaching hospital was associated with significantly higher costs but also with higher payments and greater profitability.**

KEY WORDS: **health care finance; residents; length of stay; indirect costs.**
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Competitive pressures and a decline in federal education subsidies have encouraged many teaching hospitals to evaluate their training programs more closely from a financial perspective. Such analysis has proved difficult to accomplish in a manner convincing to both educators and financial planners.[1–4] Because postgraduate medical education is conducted in close association with patient care, allocation of costs between the two is necessarily complex and subjective. Without resolving this methodologic problem, most previous studies have found resident care more costly.[5–11] Likewise, current government-funded subsidies of teaching hospitals reflect the generally held belief that postgraduate medical education is a net financial burden to its sponsors.[12]

No recent study has examined resource use and reimbursements associated with resident care across a range of medical diagnoses, and none has done so in a community teaching hospital. At our community hospital, we compared payments and costs associated with care of general medicine patients on a teaching unit (staffed by residents and their supervising attending physicians) and on nonteaching units (where no residents were present). Our method considered differences between these two patient groups in the distribution of case complexity, diagnoses, and characteristics of the attending physicians.

METHODS

Site

This study was performed using data from Saint Barnabas Medical Center (SBMC), a 620-bed community teaching hospital in Livingston, NJ. The hospital is affiliated with Mount Sinai School of Medicine, NY. Saint Barnabas Medical Center had 142 postgraduate trainees in nine residency programs at the time of the study. There were 40 residents in SBMC's internal medicine residency

training program, which was fully accredited by the Accreditation Council for Graduate Medical Education (ACGME) in August 1999, reflecting performance during the period of this study.

Patients were admitted to the hospital's medical service by 487 attending staff members. There were 40 beds on a geographic general medicine teaching unit, 40 beds on a geographic specialty renal teaching unit, and up to 270 other beds, including intensive care, cardiac care, and designated pulmonary, oncology, and nonteaching medical/surgical units. Patients were admitted to the geographic general medicine teaching unit based on the preference of the attending physician and patient, and on bed availability. Teaching patients were admitted exclusively to teaching units; however, when the hospital was full, nonteaching-unit patients were also placed on the teaching units.

Teaching-unit patients were under the care of residents supervised by attending physicians in accordance with requirements of the Residency Review Committee for Internal Medicine of the ACGME. Nonteaching-unit patients were cared for by attending physicians without residents, but coverage assistance was available at night and on weekends from licensed house physicians. No resident served as a house physician, and no physician assistant or nurse practitioner provided inpatient care. Nurse-to-patient ratios were the same on the geographic general medicine unit as on nonteaching medical/surgical units. Social workers and case managers were available on all nonintensive care hospital units.

A review of 100 randomly selected charts of medical patients discharged from the general medicine teaching unit during the study period indicated that supervised residents cared for 68% of patients. Review of 100 discharges from nonteaching medical/surgical units indicated that residents cared for none of these patients.

Patient Selection

Using a comprehensive patient database (Trendstar, HBOC, Inc., Atlanta, Ga), we collected data on discharged patients assigned a medical diagnosis-related group (DRG). We included all patients discharged between July 1998 and January 1999 (inclusive) from all wards of the hospital other than intensive care and specialty units. Specialty units excluded from study consisted of geographically designated renal, pulmonary, and oncology areas. Timing of the study was determined at its onset by implementation of a cost database and at its termination by changes in the geographic teaching service because of hospital construction. Both winter and summer months were represented. We excluded any patient whose attending physician at discharge was not a member of the department of medicine or family practice. Patients with a length of stay (LOS) over 30 days were classified as outliers; all endpoints were calculated with these patients included.

Data Collection

Abstracted data for each discharge included demographic information, the nursing unit from which the patient was discharged, DRG, disposition, source of admission, attending physician at discharge with departmental affiliation, LOS, principal insurer, hospital days for which payment was denied by the insurer, and payments to the hospital. Costs to the hospital were calculated for each patient using a cost allocation program and were based on the unit cost of each item, service, or procedure used for care of that patient. Salary costs were allocated to each item, service, or procedure based on time for implementation expended by personnel of the relevant cost center. The hospital's capital and overhead costs (including those for its teaching programs) were distributed in accordance with Medicare step-down methodology. This methodology assigns among clinical services overhead and other costs not easily attributable to a particular patient care activity.[13]

At the time of this study, the cost allocation program in the pharmacy cost center was not fully functional. Therefore, we assessed costs based on pharmacy-specific charge-to-cost ratios determined by the cost allocation program immediately subsequent to the study period. We combined cost centers of clinically related services into seven cost areas: pharmacy, radiology, cardiopulmonary, laboratory, critical care room and board, ward room and board, and other costs.

It seemed likely that patients admitted to the teaching unit and nonteaching units might differ in clinical characteristics and DRG distribution. To compare resource utilization between these two groups, we calculated the difference between observed and predicted outcomes ("excess" cost or LOS) for each patient in each group. Predicted cost and LOS for each patient were obtained using a proprietary risk adjustment program (see below). Mean and median excess values were calculated for all teaching-unit and nonteaching-unit patients. In addition, we compared patients on the two types of unit with respect to observed costs, observed payments (at least a year after delivery of services), and the difference between them (profitability).

To provide a measure of clinical severity, we stratified patients by their risk of in-hospital death using All Payer Refined DRGs (APR-DRGs, 3M Health Information Systems, Wallingford, Conn). This methodology first assigns patients to an adjacent DRG (ADRG) formed by grouping individual DRGs previously split by complications and co-morbidities. Patients within each ADRG are then assigned to one of four levels of severity based on data derived from billing information.[14]

Risk Adjustment

Risk adjustment modeling was used in this study to determine expected LOS and costs for each patient. Calculations were performed by New Solutions, Inc. (New Brunswick, NJ), using a refinement of SysteMetrics

disease-stage modeling.[15–18] Models are based on multiple or logistic (for dichotomous data) regression of variables obtained from the standardized Uniform Bill data set.[19] Data for model development are drawn from state and national resources, including the national Medicare Provider Analysis and Review File (MEDPAR) database.[20] Models are reviewed on an annual basis and are specific for risk of particular outcomes, including cost and length of stay.

Briefly, the modeling method first assigns each patient to a DRG and then to an ADRG using standard grouper software. Patients within each ADRG are then further characterized by the presence of variables found (on univariate analysis) to be associated with the outcome under study. Clinical diagnoses are excluded from the model (even if associated with outcome) if, in the opinion of an expert physician panel, they represent complications of hospitalization rather than preadmission predictors of outcome. Finally, remaining variables (selected from all diagnoses, demographics, and the number of involved body systems) are assigned individual likelihood weights from multiple regression. Using this method, each patient is assigned a probability of the outcome under study, and a group probability can be readily calculated. Variables used for modeling are regularly reviewed for face validity by clinical experts. Models with variable weights and measures of statistical validity including R^2 calculations are open to inspection.

In calculating predicted cost and LOS, the risk adjustment program weighted, among other variables, the factors by which DRGs are determined. These factors include principal diagnosis, outcome, comorbidities, and age. We therefore included all patients, irrespective of DRG, in our analysis of group endpoints.

Stratification by Attending Attributes

Attending physicians who frequently admit patients to a teaching unit may differ in their utilization of resources from those who rarely admit to a teaching unit. Such differences could bias the effect of resident care. We therefore stratified patients according to the admitting habits of the attending physician. Patients of attending physicians who admitted more than half of their patients to the teaching unit (teaching attendings) were compared for all endpoints to patients with attending physicians who admitted fewer than half of their patients to the teaching unit (nonteaching attendings).

Statistical Analysis

Excess costs, excess LOS, payments, and profitability were reviewed for approximation to a normal distribution. We applied nonparametric testing (Mann-Whitney *U* test) to data sets when the mean and median differed by more than 15%, when less than 3% (or more than 7%) of the data points fell beyond 1.96 standard deviations from the mean, or when outliers were not evenly distributed to the two tails (30% to 70% in each tail). We reported *z* scores for nonparametric tests. For all other data sets, we reported 95% parametric confidence intervals.

RESULTS

There were 2,550 discharges meeting Health Care Financing Administration criteria for medical DRGs. Of these, 1,615 represented patients who met our inclusion criteria. They were cared for by 126 teaching attending physicians and 76 nonteaching attending physicians in the departments of medicine or family practice. There were 917 teaching-unit patients and 698 from other units. Twenty-one of these patients were outliers, 18 were teaching-unit patients and 3 were from the other units. One patient who was eligible was excluded because of incomplete data.

Patient Characteristics

Table 1 summarizes characteristics of patients on the teaching and nonteaching units stratified by attending physician teaching preference. Patients were similar in mean age, gender, ethnic makeup, referral source, disposition on discharge, and insurance coverage (the majority were insured by Medicare). As expected, patient groups differed in the distribution of DRGs, confirming the need for risk adjustment in comparing costs and LOS. In addition, patients on the teaching unit were more severely ill. Among teaching-unit patients, 8% were in APR-DRG category 4 (extreme risk of death), compared with 3% among nonteaching-unit patients ($P < .05$ by χ^2).

Excess Length of Stay

The distribution of excess LOS was skewed to the right. Both teaching and nonteaching groups had stays slightly shorter than predicted. Median excess LOS among teaching patients was −0.6 days; among nonteaching patients, the median excess LOS was −0.5 days. The Mann-Whitney *Z* statistic was 0.75, indicating that the difference was not significant. Across both types of unit, excess LOS was not affected by attending preference for teaching. Median excess LOS was −0.6 days for all teaching attendings and −0.5 for all nonteaching attendings.

Excess Costs

Although observed costs were skewed to the right, excess costs were normally distributed. Figure 1 shows mean excess costs and ratios of expected to actual cost per hospital discharge. All patient groups generated costs that were much lower than predicted by the risk adjustment program. On average, care of teaching-unit patients cost \$3,178 (95% confidence interval [CI] ± \$489) less than predicted, while care of nonteaching-unit patients cost \$4,153 (95% CI ± \$422) less than predicted. Teaching-unit

Table 1. Patient Characteristics*

	Teaching-Unit Patients		Nonteaching-Unit Patients	
	Teaching Attending (*n* = 760)	Nonteaching Attending (*n* = 158)	Teaching Attending (*n* = 371)	Nonteaching Attending (*n* = 325)
Male, %	41	39	36	35
Mean age, y	68.3	69.1	67.8	64.5
Ethnicity, %				
White	68	66	66	71
African American	18	20	18	18
Unknown	12	13	16	10
Other	0	0	2	1
Admission type, %				
Emergency room	86	73	84	77
Routine scheduled	9	17	8	17
Routine unscheduled	3	6	5	4
Other	0	4	3	0
Disposition, %				
Died	4	3	4	3
Home self-care	71	73	74	76
Intermediate care	1	0	2	2
Other	10	4	9	8
Short-term hospice	1	1	1	1
Skilled nursing facility	13	18	9	7
Most common DRGs, %				
Simple pneumonia (89)	7	4	3	—
Septicemia (416)	6	7	4	—
Heart failure (127)	5	—	4	—
Cerebrovascular (14)	4	—	—	—
GI hemorrhage (174)	4	8	—	—
Esophageal/gastric (182)	—	5	—	5
Esophageal/gastric (183)	—	4	4	6
Seizure/headache (25)	—	—	—	5
Kidney/urinary Infection (320)	—	—	—	4
Medical back problem (243)	—	—	4	3
Severity (APR-DRG), %				
Mild	35	35	43	54
Moderate	30	28	33	24
Major	28	29	20	18
Extreme	8	6	3	2
Most common payers, %				
Medicare	62	68	58	55
Blue Cross	5	7	6	9
Medicare HMO	—	—	5	—
Other managed care	5	5	—	6

* *Stratified by attending preference for teaching. Some entries do not add up to 100 because of rounding errors.*
DRG indicates diagnosis-related group; GI, gastrointestinal; APR, all payer refined.

patients cost 67% (95% CI ± 4%) as much as predicted, and nonteaching-unit patients cost 57% (95% CI ± 4%) as much as predicted, indicating a significant difference in excess cost between teaching and nonteaching units. Like LOS, costs were not greatly affected by attending preference for teaching. Across both types of unit, patients of teaching attendings cost an average of $3,504 (95% CI ± $408) lower than expected, or 63% (95% CI ± 4%) of predicted. The average cost of patients cared for by nonteaching attendings was $3,632 (95% CI ± $569) less than expected, or 61% (95% CI ± 5%) of predicted.

Despite variability in DRG distribution between the groups, no marked difference in percentage distribution of observed costs for most cost areas was demonstrated (Fig. 2). However, intensive care room and board accounted for 5.8% more of the total costs for teaching-unit patients than for patients discharged from nonteaching units.

Payments and Profitability

Distribution of observed payments was skewed to the right. The median payment for teaching patients was $6,285; for nonteaching patients, the median was $5,436. The Z statistic was less than 0.001, indicating a significant difference.

Although observed costs for teaching-unit patients were higher than for other patients, higher payments resulted in greater profitability, which was normally

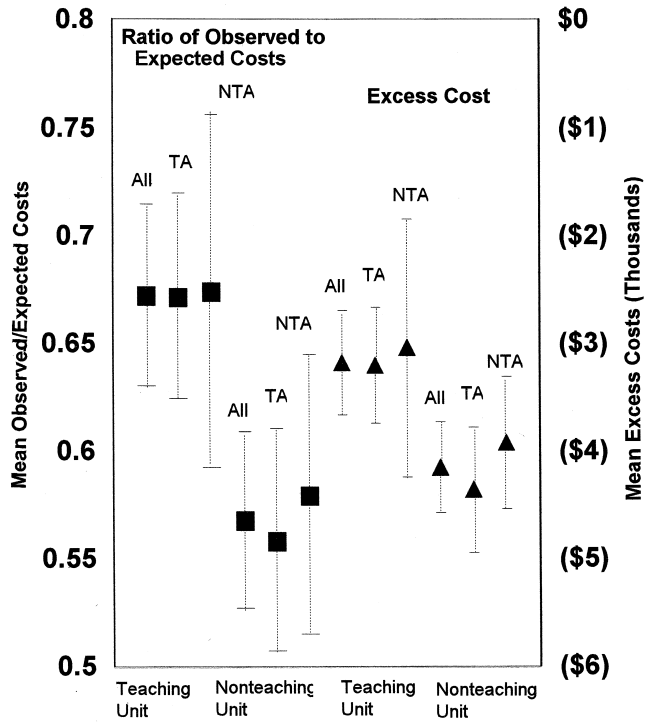

FIGURE 1. Absolute and relative excess cost for patients on the teaching unit and nonteaching units, and for teaching and nonteaching attending physicians. Means and 95% confidence intervals are shown. TA indicates teaching attendings; NTA, nonteaching attendings.

distributed (Fig. 3). On average, there was a profit of $848 (95% CI ± $307) per hospitalization for teaching-unit patients and $451 (95% CI ± $327) for nonteaching-unit patients. This difference can be attributed primarily to the patients of nonteaching attendings. Among these attendings, patients on the teaching unit generated an average profit of $1,299 (95% CI ± $613) per discharge, while patients on the nonteaching unit generated an average profit of $208 (95% CI ± $437). Recalculation of endpoints without the 21 outliers did not substantially alter these results.

Table 2 summarizes the difference in payments between teaching-unit and nonteaching-unit patients. Nine of the 12 payers contributing more than 1% to reimbursements of patients on both types of unit reimbursed more for teaching-unit discharges. Median payment by Medicare, the most common payer, was $583 more for teaching-unit patients than for patients from other units.

One possible explanation for observed differences in profitability between teaching and nonteaching units is that more detailed chart documentation was typical of residents and resulted in fewer days for which reimbursement was refused or lowered by the insurer. We found that teaching-unit patients were reimbursed at a lower rate (or not at all) for 2.4% of hospital days; nonteaching-unit patients were poorly reimbursed for 3.1% of hospital days (P = .03 by χ^2). The difference in poorly reimbursed days between teaching and nonteaching units was greater when only the patients of nonteaching attendings were considered (1.4% vs 2.7%, P = .02).

Although costs and LOS were compared between patient groups only after adjustment for expected values, no such adjustment was made for payments. Therefore, another possible reason for observed differences in profitability is that the teaching unit contained a higher proportion of more profitable DRGs, particularly among patients of nonteaching attendings. Figure 4 shows the distribution of DRGs between the two most discrepant groups with respect to profitability (teaching-unit and nonteaching-unit patients of nonteaching attendings). Although there are differences in the distribution of DRGs between the two types of unit, most DRGs received a higher reimbursement for patients on the teaching unit.

DISCUSSION

At a community teaching hospital with a large proportion of Medicare-insured patients, we found that resident care had no association with LOS but was associated with increased costs. Payments and therefore profitability were substantially higher when residents were involved in care, particularly among attending physicians who do not usually admit to a teaching service.

One contributing factor to the difference in profitability was certainly a decrease in denied days for teaching-unit patients, presumably due to fuller resident documentation.

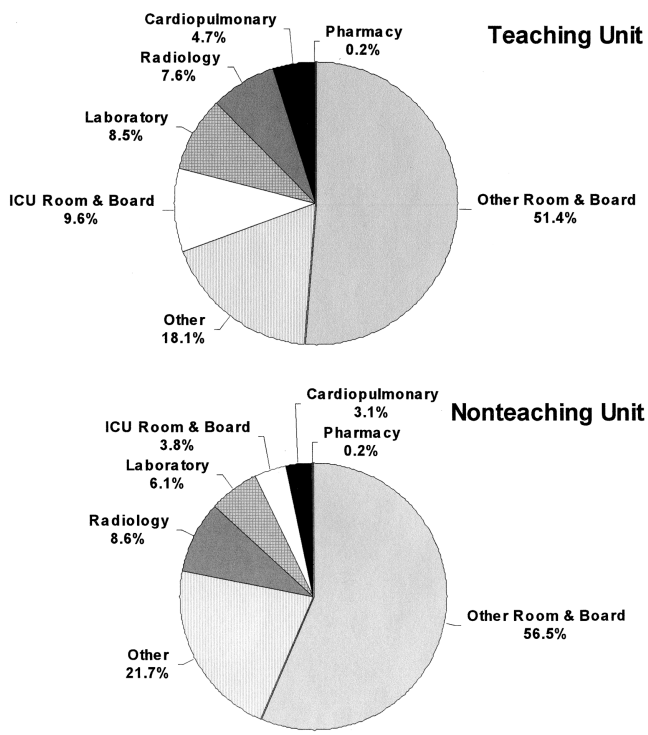

FIGURE 2. Distribution among cost areas of observed costs for teaching-unit and nonteaching-unit patients. ICU indicates intensive care unit.

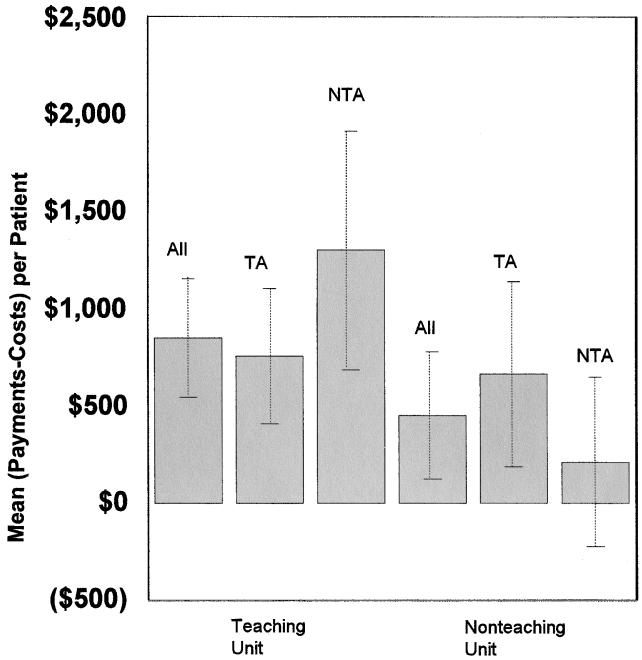

FIGURE 3. Profitability of patients on the teaching and nonteaching units, and of teaching and nonteaching attending physicians. Means and 95% confidence intervals are shown.

Differences between teaching and nonteaching units were more marked among nonteaching attendings, both for profitability and denied days. However, the observed difference in mean per-discharge profitability of $1,091 would have required a difference in denied days far greater than 1.3% for this to be the only explanation. The finding that teaching-unit patients were at greater risk of in-hospital death suggests another explanation—that elements of cost may have been more highly reimbursed in these sicker teaching patients. The utilization of intensive care unit services among teaching cases was greater and may support this hypothesis. Finally, there may have been differences in case selection that influenced reimbursement in ways we did not measure. At present, our finding is not fully explained.

We undertook the present study for several reasons. First, most of the literature predates health care's new emphasis on cost containment. Second, data are lacking on the association between resident care and utilization of services across a range of patients in a community teaching hospital. Third, no study has addressed the possible confounding of resident resource use by differences in practice patterns between the physicians who usually supervise them and those who usually do not. Fourth, payments and profitability represent important but seldom-measured determinants of net teaching costs.

Several multicenter studies comparing teaching and nonteaching hospitals have found that costs of care and LOS are higher in institutions where residents train. These increases have been related to the level of training.[5,6] The type of residency program may also be important; one study in New Jersey found that hospitals with family practice residencies had lower inpatient costs compared with nonteaching hospitals or with hospitals sponsoring other types of training programs.[7]

These interinstitutional comparisons have attributed increased use of resources at teaching hospitals in part to the inexperience of residents. However, one study specifically refuted this explanation by finding similar resource utilization among teaching patients admitted early and late in the academic year.[21] Another proposed reason for higher costs in teaching hospitals is that these institutions may make tests and procedures available, primarily for teaching purposes, and the availability encourages overspending on both teaching and nonteaching patients. Higher costs at teaching hospitals may result not from teaching per se but from the necessary overhead of large tertiary care institutions in which teaching tends to occur. These hospitals also may care for patients who are sicker in ways not measured by DRGs.[22]

Comparing teaching and nonteaching services within an individual hospital narrows the focus but can minimize

Table 2. Median Payments by Payer and Payer Characteristics

			Teaching Unit		Non-teaching Unit	
Payer	Payment Basis	Payment Unit	Patients, %	Median Payment, $	Patients, %	Median Payment, $
Medicare	Prospective	Per case	63	6,641	57	6,057
Other managed care	Prospective	Per day	5	4,653	4	5,017
Medicare HMO	Prospective	Per day	3	5,145	5	3,316
Commercial other	Fee-for-service		3	5,201	4	4,104
US Healthcare	Prospective	Per day	3	2,758	3	1,997
Oxford	Prospective	Per day	2	2,925	3	2,786
Blue Cross Managed Care	Prospective	Per day	2	3,608	2	2,930
Self-pay	Fee-for-service		3	0	2	0
Prucare	Prospective	Per day	2	4,396	3	1,954
Medicaid	Prospective	Per case	3	3,879	2	2,883
FOHP	Prospective	Per day	2	1,908	2	4,750
Blue Cross	Prospective	Per day	5	5,636	8	3,627

FOHP indicates First Option Health Plan.

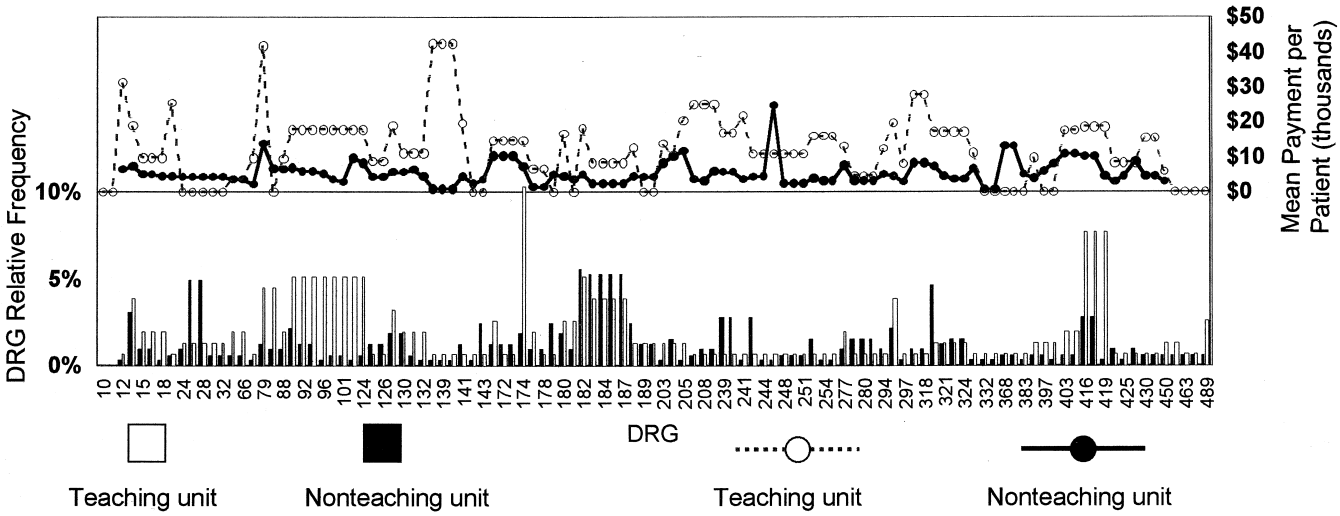

FIGURE 4. Distribution of diagnosis-related group (DRG) for patients of nonteaching physicians on the teaching and nonteaching units. Relative frequency and median payment for each DRG are shown. The bars in the lower part of the figure indicate relative frequency of DRGs in the two patient groups. The lines in the upper part of the figure indicate median payment for each DRG in the two patient groups.

problems of confounding resident costs with those institutional overheads for which teaching may be a marker but not a cause. Some studies taking this approach have found that residents may actually increase efficiency. For example, expansion of a residency program in Pennsylvania in 1989 increased hospital revenue more than costs and may have decreased LOS.[23] A "minor teaching hospital" in Minnesota studied LOS and high-cost interventions in patients with myocardial infarction on their teaching and nonteaching services. Even after stratifying by severity, these authors found that the mean LOS was 0.6 days shorter, the mean charges were $2,060 less, and cardiac catheterizations were 15% less prevalent on the teaching service.[22]

Conversely, a comprehensive review of surgical and medical patients at Stanford's university hospital in 1981 and a focused study of four surgical DRGs at the same institution found that costs within DRGs were higher on the teaching service. Costs for surgical patients were lower when residents received closer supervision.[8–10] Similarly, comparison of a teaching and a faculty-run hospital service at a major teaching institution in 1991 found higher costs for teaching patients.[11]

Our results were similar to those of the Stanford study with regard to costs, although differences between teaching and nonteaching patients were considerably smaller in our study. Our setting, period of observation, and methods were more similar to those of the Minnesota study, although we did not find lower costs. Unlike those investigators, who developed and applied their own regression model of risk adjustment within the study population, we chose a proprietary risk adjustment methodology. A possible advantage of our approach is that the risk analysis is derived from and validated on a large and separate database. Our study appears to be unusual in examining profitability, which we found to be improved by resident care despite an increased use of resources. We also found that the attending physician's teaching preference influenced differences in profitability between a teaching and a nonteaching service.

Because of current controversy over issues of residency finance, it is particularly important to identify the limitations of this study. Most importantly, we did not directly explore the net financial effect of our internal medicine training program on the hospital. All patients at SBMC assumed some of the overhead costs of teaching (based on their utilization of resources to which these costs were allocated). Similarly, all Medicare and Medicaid patients, teaching and nonteaching, were reimbursed in part by federal teaching subsidies that augmented payments to the hospital. Whether the costs or the subsidies associated with teaching were greater at our community hospital is a question that this study did not address. We found that medical residents at our institution produced more in extra payments than they expended in extra resource use. We cannot deduce whether this incremental revenue enhanced, offset, or had little effect on the difference between fixed teaching costs and current or future government subsidies.

In addition, an important subset of medical patients was not considered in this study. Patients discharged from the medical intensive care unit and the pulmonary, renal, oncology, and cardiac care wards were all excluded.

Another limitation of this study is that teaching patients were identified by the unit from which they were discharged. We found no obvious differences between this unit and other medical/surgical units in the hospital; however, it is possible that attributes of the teaching unit other than the presence of residents may have contributed to observed differences. Conversely, the fact that residents

cared for only 68% of patients on the teaching unit almost certainly produced an underestimate of their effect.

Finally, in this complex determination by retrospective analysis, it is possible that unmeasured sources of bias produced the observed differences in costs and payments.

We conclude that teaching hospitals should not assume an adverse effect of residency training on profitability, even if residents are shown to increase resource use. With the advent of comprehensive patient-based computer databases and the availability of risk adjustment software, even relatively small teaching hospitals may be able to review the economic consequences of their own teaching programs.

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Measuring Community Benefits Provided By For-Profit And Nonprofit Hospitals

Nonprofits appear to be falling short of providing the expected level of community benefits, according to this new model.

BY SEAN NICHOLSON, MARK V. PAULY, LAWTON R. BURNS, AGNIESHKA BAUMRITTER, AND DAVID A. ASCH

ABSTRACT: Nonprofit hospitals are expected to provide benefits to their community in return for being exempt from most taxes. In this paper we develop a new method of identifying activities that should qualify as community benefits and of determining a benchmark for the amount of community benefits a nonprofit hospital should be expected to provide. We then compare estimates of nonprofits' current level of community benefits with our benchmark and show that actual provision appears to fall short. Either nonprofit hospitals as a group ought to provide more community benefits, or they are performing activities that cannot be measured. In either case, better measurement and accounting of community benefits would improve public policy.

Approximately 86 percent of U.S. community hospitals are nonprofit, and 14 percent are for-profit. Although the central purpose of both is to provide hospital services to their communities, for-profit hospitals are also supposed to provide financial returns to their owners and financial support to the community through the taxes they pay. Nonprofit hospitals do not have these obligations to owners and are, in addition, exempted from most taxes. Indeed, they are viewed primarily as charitable organizations, and in return for this designation they are expected to provide more benefits or a different kind of benefit than for-profit hospitals provide.

For-profit hospitals typically have to compete with nonprofit hospitals in the same community. For this reason, defining and valuing community benefits has become increasingly important as nonprofits struggle to defend their protections. We believe that current measures of community benefits in both research and state laws are imprecise and unsound. In this paper we develop a new method of identifying activities that qualify as

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community benefits. We use the economic concept of a public good—something that benefits all, whether they pay or not—to identify the types of activities that might properly be classified as community benefits.

We also develop a new method for determining a benchmark for the amount of community benefits a nonprofit hospital should be expected to provide. Since nonprofit hospitals do not need to generate a profit to satisfy shareholders, they should be expected to provide community benefits that are equal to the sum of those provided by for-profit hospitals and the profit these hospitals earned. This benchmark is likely to be higher than the conventional standard: that a nonprofit hospital should provide community benefits that are at least as large as the taxes it would pay if it were for profit. We then compare estimates of the current level of provision of community benefits by U.S. nonprofit hospitals with estimates based on our benchmark.

Defining Community Benefits

We use the economic distinction between public and private goods as our key concept in defining a valid and useful measure of community benefits. In economic theory, private goods are defined as goods that benefit, affect, or are appreciated by the direct user only.[1] A community is better off if its citizens can obtain more private goods, but no one would contend that the supply of private goods (such as clothing, entertainment, or food) constitutes provision of community benefit.

A public good, on the other hand, generates benefits for people other than the direct buyer and user by increasing the utility, or well-being, of nonusers.[2] Although most medical services are private goods, some, such as those that treat or prevent contagious disease, have important public-good dimensions. The use of medical care by low-income and high-risk persons also can be a less obvious but important type of public good. Low-income persons, if left to the competitive market, may use so little medical care that altruistic community members become concerned. In this case, additional use of medical services by the poor would provide external or public goods to others. Everyone in the community, user and nonuser alike, presumably values knowing that high-risk and poor persons are being treated properly.

Public goods will be furnished in insufficient quantities by competitive markets because it is difficult to convince all of the people who benefit from the good to pay for it. Therefore, hospitals that supply public goods are providing a community benefit. The public-good concept provides a potentially verifiable measure of "community benefits": a service consumed by an individual that others beyond the direct consumer attach positive value to and that is subsidized. Services valued by the community but sold at a profit would not qualify as community benefits. The determination of what qualifies as a public good is subjective. Sometimes the existence of external benefits depends on the nature of the illness treated, but often it depends on the patient's characteristics (low-income or high-risk) and the community's preferences.

We use the public-good framework to develop a set of hospital activities that we believe constitute community benefits (Exhibit 1). The first four activities—uncompensated care, the cost of other unbilled public-good services, losses on medical research, and taxes—have a strong justification for being interpreted as community benefits. The rationale for the final four activities—Medicaid and Medicare shortfalls, price discounts to privately insured patients, and losses on medical education—is more debatable.

■ **Uncompensated care and other public-good services.** Uncompensated indigent care is perhaps the clearest example of a public good provided by hospitals.[3] Hospitals that treat poor persons provide a direct benefit to the patient and an indirect benefit to altruistic members of the community, and charity care probably reduces government spending on medical care and therefore reduces taxes. Uncompensated care accounts for situations in which services are provided, a bill is generated, but at most only a fraction of the bill is actually collected. Hospitals pro-

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EXHIBIT 1
Components Of Hospital Community Benefits

Component	Proposed measure
Conservative definition of community benefits	
Uncompensated care	Cost of charity care and bad debt: gross charges for billed, uncollected services multiplied by the cost-to-charge ratio
Other "public-good" services that are not billed[a]	Expenses for selected services
Losses on medical research	Research expenses — research funding
Taxes (for-profit hospitals only)	Sales tax on supplies + property taxes + income taxes
Inclusive definition of community benefits[b]	
Medicare shortfall	(Difference in profit per privately insured and Medicare patient) × (percentage difference in Medicare as proportion of total admissions between hospital and for-profit benchmark) × (number of admissions)
Medicaid shortfall	(Difference in profit per privately insured and Medicaid patient) × (percentage difference in Medicaid as proportion of total admissions between hospital and for-profit benchmark) × (number of admissions)
Price discounts to privately insured patients	(Difference between nonprofit hospital's and for-profit benchmark hospital's case-mix-adjusted net revenue per privately insured admission) × (number of privately insured admissions)
Losses on medical education	Medical education expenses − tuition revenue − government funding

SOURCE: Authors' analysis.
[a] The cost of unbilled, public-good services will be difficult to measure because it requires distinguishing a free service that generates an external benefit from a marketing program that has a cost but also an expected revenue.
[b] Includes all items above.

vide other services that have external benefits that do not generate a bill. Examples include an acquired immunodeficiency syndrome (AIDS) prevention clinic, education classes for women with a high-risk pregnancy, and health screening for low-income persons. Expenses associated with these services are omitted from uncompensated care but should be included in the community-benefit measure.

■ **Medical research and taxes.** Hospitals that subsidize medical research activities provide a public good to the community because all patients benefit from the research discovery. Most for-profit hospitals pay real estate taxes, sales taxes on the supplies they purchase, and income taxes on profits. A community that taxes a for-profit hospital benefits because it will be able to tax its citizens and businesses at a lower rate than can a community that receives the same services from a nonprofit hospital that does not pay taxes.

■ **"Other" activities.** The reasons for including Medicare and Medicaid shortfalls, price discounts to private health insurance companies, and losses on medical education are more debatable. A Medicare or Medicaid shortfall occurs when government payments are lower than the hospital's treatment costs. Proponents of treating such shortfalls as community benefits argue that a hospital relieves the government of a financial burden when it provides care to publicly insured patients. Alternatively, if one believes that Medicare and Medicaid hospital payments reflect voters' preferences for the amount of medical resources they wish to devote to these patients, the shortfalls should not be considered a community benefit. According to this view, if society wanted hospitals to use more resources in treating Medicare and Medicaid patients, it would direct politicians to raise payment rates. The fact that Medicare and Medicaid pay less than the cost of care at some hospitals

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may imply that voters do not fully value the services covered by this additional cost. States disagree about whether Medicare and Medicaid shortfalls should be considered community benefits; Utah and Missouri allow these shortfalls to be counted toward a hospital's community benefit requirement, while Massachusetts explicitly disallows them.

Some hospitals can charge private health plans prices that exceed costs and use the resulting profits to fund public goods. If a hospital chooses to charge less than the profit-maximizing price, should the price discount be considered a community benefit? The price discount increases the insurance company's profit and reduces the hospital's potential profit by the same amount. Hence, "underpricing" transfers money from some members of the community to others rather than creating an incremental benefit to the entire community. Therefore, price discounts are at best community benefits whose value is equal to their cost.

"The for-profit hospital is a valid benchmark for the nonprofit hospital because they are both subject to the same business conditions."

Likewise, teaching hospitals that subsidize medical education transfer potentially higher incomes to medical students and residents. Losses on medical education should not be included as a community benefit if one believes that there would be a sufficient number and quality of medical students without any subsidies. However, if one believes that subsidies are required to ensure a sufficient number or quality of physicians, then losses on medical education should be interpreted as a community benefit. There are now three times as many applicants as there are medical school positions; however, it is possible that even better-qualified applicants would be attracted under more favorable financial conditions.

The public-good definition we propose does exclude some activities that others have cited as community benefits. Jan Clement and colleagues argue that the profits earned today by nonprofit hospitals are a community benefit because these profits can be used to provide community benefits in the future.[4] We believe that this interpretation is incorrect. Suppose a nonprofit hospital earns profits in Year 1 that are then used to subsidize a free clinic for low-income persons in Year 2. The subsidy to the clinic should be counted as a community benefit in Year 2, but it would be double counting to also include the profit earned in Year 1 as a community benefit.

Determining A Community Benefit Benchmark

To develop standards regarding how much hospitals should spend on community benefits, one must be able to describe a benchmark situation in which no community benefits are provided. One possible benchmark is a situation where there are no hospitals in a given community. Providing hospital care at a price that patients or their insurers are willing to pay obviously then generates benefits. Any supplier of a good that is voluntarily purchased provides this "consumers' surplus"—the excess of value over price. However, there is nothing special about the consumers' surplus from hospital care that would warrant special attention or subsidies, so we will not use this benchmark.

The benchmark that we elect to use is a competitive market that has at least one nonprofit and one for-profit hospital. Competing hospitals cannot set prices above cost. Hospital patients, persons who might donate to hospitals, and persons who might invest in hospital debt and equity are assumed to live in the same community. Any benefit provided to this community by any hospital will therefore have to be fully paid for by its members. Postulating a closed model highlights that hospitals provide community benefits not out of their own generosity but by extracting resources from community members. From the

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perspective of the community as a whole, there is no such thing as "free care," and hospitals do not "give" benefits.

In our benchmark market, nonprofit hospitals obtain resources from four sources: They hire labor and buy supplies, they borrow from members of the community by issuing debt, they receive donations, and they retain profit from previous years.[5] For-profit hospitals also can obtain resources by selling stock to investors who expect future dividends and an appreciation in the stock price.

The for-profit hospital in this market charges a price that just allows it to cover its labor and supply costs, interest payment on bonds, taxes, and stockholders' required return on their investment. The nonprofit hospital also must cover its labor, supply, and interest expenses, but it does not need to generate a profit to satisfy stockholders. Consider a case where a for-profit hospital provides no community benefit and earns a profit large enough to attract "sufficient" investment funds from stockholders. A similar-size nonprofit hospital in the same market might be expected to spend on community benefits an amount equal to the for-profit hospital's profit. The for-profit hospital is a valid benchmark for the nonprofit hospital because they are both subject to the same business conditions. To account for the amount of assets and equity used at the two hospitals, the nonprofit hospital's expected level of spending on community benefits should be equal to the for-profit hospital's return on equity (ROE) or return on assets (ROA) multiplied by the nonprofit hospital's equity or assets (ROE).[6] If the nonprofit hospital spends less on community benefits than this benchmark amount, it either could be using its assets for other purposes that the community does not value, or it could be accumulating profit to provide community benefits in the future. One should be able to address the latter issue by examining community benefits over time, rather than year by year.

In the scenario described above, the for-profit benchmark hospital did not provide any community benefits. In actuality, for-profit hospitals pay taxes, provide other community benefits, and still generate a return for stockholders. Therefore, the benchmark level of community benefits for nonprofit hospitals should be equal to the sum of the for-profit hospital's tax payments, cost of the community benefits, and after-tax profit, adjusted for differences in the assets or equity at each hospital. In general, one should expect nonprofit hospitals to spend more on community benefits than what they would have paid in taxes.

Comparing Actual And Expected Community Benefit Spending

Exhibit 1 proposes a practical method for measuring each of the activities that constitute community benefits. Ideally one would like to quantify the value of community benefits from the citizens' perspective. The value could be greater or less than the cost incurred by the hospital to provide these services. Measuring value is difficult, and so many organizations responsible for defining and measuring community benefits recommend, with apologies, that cost be used instead. We also adopt this simpler and more feasible measurement approach.

■ **Actual spending.** We have argued that a nonprofit hospital's expected spending on community benefits should be equal to the amount that an otherwise similar benchmark for-profit hospital spends on community benefit plus the for-profit hospital's profit. Exhibit 2 shows financial data for the three largest U.S. for-profit hospital systems for 1996–1998. With currently available data, we are able to estimate only two of the four activities that have the strongest justification for being community benefits—taxes and uncompensated care. Moreover, our estimates are all based on accounting data that are unlikely to be perfectly accurate, so our results should be interpreted with caution and considered as an illustration of the method.

Collectively, Columbia/HCA, Tenet, and Universal Health Services paid an average of $810 million per year in income taxes during 1996–1998. Sales taxes on supplies and real

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EXHIBIT 2
Using For-Profit Performance Measures To Define The Expected Level Of Community Benefits At Nonprofit Hospitals

Community benefits provided	Average annual performance for three for-profit hospital systems, millions of dollars, 1996–1998
Income taxes	$ 810
Estimated sales tax on supplies	165
Estimated property tax	263
Estimated cost of uncompensated care	1,160
Total community benefits	2,398
Profit	
Revenues	30,077
Expenses	28,288
Income taxes	810
Net income after taxes	979
Community benefit benchmark for nonprofit hospitals	
Estimated profit if no community benefits were provided	3,377
Book value of equity	11,228
Book value of assets	32,811
Adjusted return on equity	30.1%
Adjusted return on assets	10.3%

SOURCES: COMPUSTAT; company annual reports; Prospective Payment Assessment Commission, *Medicare and the American Health System: Report to Congress* (1996); and authors' analysis.
NOTE: The three for-profit systems are Columbia/HCA, Tenet, and Universal Health Services.

estate taxes are not reported directly on publicly available financial statements. We assume that the companies pay a 4 percent sales tax on their supply purchases, which results in an estimated combined annual sales tax of $165 million. Based on a 1992 Health Care Financing Administration (HCFA) analysis of real estate taxes paid by for-profit hospitals, we assume that these companies pay property taxes equal to 1.6 percent of their fixed assets.[7] Applying this tax rate to the value of the companies' net property, plant, and equipment implies estimated property tax payments of $263 million per year.

The Prospective Payment Assessment Commission (ProPAC) analyzed data from the 1995 American Hospital Association (AHA) annual survey of hospitals and concluded that for-profit hospitals provide uncompensated care equal to 4.1 percent of their total operating costs, on average.[8] If Columbia/HCA, Tenet, and Universal exhibit similar behavior, they would provide $1.2 billion of uncompensated care per year.

Between 1996 and 1998, therefore, Columbia/HCA, Tenet, and Universal spent an estimated $2.4 billion per year on community benefits and earned an annual profit of close to $1 billion, on average (Exhibit 2). If the three had not provided any community benefits, their average return on equity and return on assets would have been an estimated 30.1 percent and 10.3 percent, respectively. These rates of return establish the expected community benefit spending for nonprofit hospitals.

A few caveats should be mentioned. We are not able to document from financial statements how much these companies spent on unbilled services that have a public-good characteristic, nor the losses incurred, if any, on medical research. This limitation will understate the adjusted rate of return benchmark. Moreover, we assume that providing uncompensated care reduces profit dollar for

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dollar. If the costs of providing uncompensated care are largely fixed, we will overstate the community benefit benchmark. This is not a problem as long as the same assumption regarding the variable costs of uncompensated care is applied to nonprofit hospitals.

■ **Expected spending.** The benchmark rate of return on equity and assets can be applied to the equity and assets of a particular nonprofit hospital to determine its expected level of community benefit spending. This is illustrated in Exhibit 3 using 1995 data on 3,646 nonprofit, private, general acute care hospitals. The mean accounting value of equity and assets among these hospitals was $43.8 million and $88.3 million, respectively. Applying the adjusted for-profit rates of return from Exhibit 2, the average nonprofit hospital would be expected to spend $9.1–$13.2 million on community benefits, depending on whether one prefers the ROA or ROE benchmark.[9]

With available data we can construct only a partial estimate of the community benefits actually provided by nonprofit hospitals. According to ProPAC's analysis of 1995 AHA survey data, uncompensated care at private nonprofit hospitals represented 4.6 percent of operating costs.[10] This translates into average uncompensated care costs of $3.3 million per hospital in our sample, or about 25–36 percent of expected community benefit spending.

■ **Gap between expected and actual spending.** There is a $5.8–$9.9 million gap between the amount of community benefits a nonprofit hospital would be expected to provide and its actual spending on uncompensated care. Is it possible that this gap can be accounted for by other community benefit activities that we are unable to measure? It is unlikely that losses on unbilled services that have a public-good characteristic (such as AIDS clinics) explain much of this gap. Hospitals generate a bill for almost all services, especially expensive ones, in an effort to receive at least partial reimbursement for care rendered. Since losses on billed services are reflected in uncompensated care costs, losses on unbilled public-good services will probably be much smaller than the cost of uncompensated care.

U.S. medical schools received $5.2 billion for medical research in 1997 from the National Institutes of Health (NIH). Medical schools

EXHIBIT 3
A Benchmark For The Amount Of Community Benefits Nonprofit Hospitals Are Expected To Provide

	Private, nonprofit hospital mean, 1995[a]	For-profit benchmark ROE/ROA	Benchmark: expected community benefit spending per hospital[a]
Equity	$43.8	30.1%	$13.2
Assets	88.3	10.3	9.1

	Estimated actual community benefit spending per nonprofit hospital[a]	Percent of expected spending using the ROA benchmark
Uncompensated care	$3.3	36%
Subsidized medical research	0.4	4
Price discounts to private health insurance companies	3.9	43
Total	7.6	83

SOURCES: Medicare cost reports; National Institutes of Health; American Hospital Association annual survey, 1995; E.B. Keeler et al., "The Changing Effects of Competition on Non-Profit and For-Profit Hospital Pricing Behavior," *Journal of Health Economy* 18, no. 1 (1999): 69–86; and authors' analysis.
NOTES: ROE is return on equity. ROA is return on assets.
[a] Millions of dollars.

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might use patient care profits at their teaching hospitals to subsidize medical research. However, even if teaching hospitals contributed an average of twenty-five cents of their own funds to medical research for each NIH dollar, that would amount to only $440,000 in additional community benefits, on average, per nonprofit hospital. Losses on research, therefore, do not appear to explain much of the gap described above.

Teaching hospitals received an estimated $7.4 billion from the federal government in 1997 to fund graduate medical education.[11] It is unlikely that teaching hospitals subsidize medical education with patient care profits. Several studies have concluded that Medicare's indirect medical education payments exceed the indirect costs associated with training residents, and the low residents' salary implies that residents are implicitly paying the hospital for training costs.[12]

Another possibility is that nonprofit hospitals treat a disproportionate share of Medicare and Medicaid patients, who crowd out the more profitable privately insured patients. If one believes that Medicare and Medicaid shortfalls are a valid community benefit, one could use the method described in Exhibit 1 to measure the forgone profit associated with having a relatively heavy mix of publicly insured patients.[13] In 1995, however, Medicaid and Medicare admissions represented a higher percentage of total admissions at for-profit hospitals than at nonprofit hospitals: 15.9 percent versus 15.0 percent for Medicaid, and 38.5 percent versus 37.4 percent for Medicare. Although many individual nonprofit hospitals experience Medicare and Medicaid shortfalls, in the aggregate nonprofit and for-profit hospitals appear to have a similar mix of patients by type of payer.

We have left the most difficult issue, price discounts, for last. A nonprofit hospital that charges less than it "could" is forgoing profits and reducing health plan expenditures and perhaps health insurance premiums for consumers in its community. To determine whether nonprofit hospitals charge privately insured patients less than for-profit hospitals charge, one ideally wants data on the transaction prices between private insurance companies and hospitals. Although data on hospital charges are readily available, data on transaction prices are scarce. In Exhibit 1 we propose using a modified version of a method recommended by Clement and colleagues where the price discount, if any, is calculated relative to the price charged by the benchmark for-profit hospital.[14]

A recent study estimated that for-profit hospitals in California charged 12 percent higher prices than nonprofit hospitals did, controlling for patients' diagnoses.[15] Nationally, private nonprofit hospitals admit an average of 3,600 privately insured patients per year. If these hospitals offer private health insurance companies a 12 percent discount (about $1,100 per admission) relative to for-profit hospitals, each nonprofit hospital would be returning $3.9 million to insurance companies, on average. This is a substantial amount and similar in magnitude to the average cost of uncompensated care provided by nonprofit hospitals. Nevertheless, even after including price discounts and subsidized medical research as community benefits, actual community benefit spending is still only 83 percent of the expected magnitude based on the ROA benchmark (Exhibit 3), and 58 percent of the expected magnitude based on the ROE benchmark.

Suppose the typical nonprofit hospital behaves in the same way as the aggregate, spending 36 percent of the community benefit benchmark on uncompensated care, 43 percent on price discounts, 4 percent on subsidized medical research, and 17 percent on services other than community benefit. Since this hospital has decided to return nearly half of its potential profits from the community's assets in the form of reduced prices, it seems to be deciding that there are a limited number of programs for the community whose value exceeds the cost. This raises the question of why nonprofit hospitals use the community's funds for activities that transfer money within the community rather than on activities that make the community as a whole better off.

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There is one additional unanswered question suggesting that our results should be interpreted with considerable caution. Our results suggest that nonprofit hospitals are not using their funds to generate as large a volume of identifiable community benefits as they could. Obviously, however, we do not have data on what nonprofit hospitals actually do with these funds. It is certainly possible that the community might value these other activities. For example, nonprofit hospitals might use some of the community's assets to provide a higher-quality (and higher-cost) product relative to what for-profit hospitals provide. This would imply that nonprofit hospitals offer even larger price discounts once one adjusts for quality differences. For this reason, our method is most useful in identifying situations in which nonprofit hospitals might be providing fewer community benefits than expected—situations in which other benefits are not measured or are not well justified. Once the unmeasured activities are identified, hospitals might then reasonably be asked to describe and justify them.

"Nonprofit hospitals appear to fall far short of providing the expected level of community benefit that would justify current levels of investment."

Discussion

Our approach to defining, measuring, and making decisions about hospital community benefits differs from the conventional approach to this issue in several important ways. We have defined community benefits relative to a benchmark of an otherwise identical for-profit hospital. We believe that defining benefits as the addition to or differences from what the benchmark hospital would do is fair to hospitals of all ownership types and relevant for the kinds of actions (private or public) that communities seek to take in response to this kind of information. However, using for-profit hospital behavior to define the expectations of nonprofit hospitals does not imply either approval or disapproval of the level of community benefits for-profit hospitals provide.

We also have concluded that the least equivocal and most relevant set of community benefits are those services provided at zero or reduced prices to members of the community needing help to increase their consumption (because their incomes are low or their health risks are high). The primary category of public-good benefits represents services that are (1) provided for free or at prices below cost to populations that would have demanded much smaller quantities of them if they had been sold at prices equal to cost; and (2) of concern or value to nonusers. Compared with public-good activities, all other measures of benefit are less apparently linked to the economic concept of a public good, which competing for-profit firms will undersupply. Consequently, we regard the other community benefit activities as less compelling in terms of inclusion and less crucial in terms of precision of measurement.

In addition, we have provided a method to determine whether the costs incurred in providing these benefits exceed the expected benchmark. A sample calculation using this measure indicates that nonprofit hospitals appear to fall far short of providing the expected level of community benefit that would justify current levels of investment in them. Although we are unable to identify the exact reasons for this discrepancy, one explanation seems particularly plausible. It is likely that nonprofit hospitals are delivering care that is of higher quality, but the market contains inadequate measures for either identifying higher quality or compensating hospitals that deliver higher-quality care. This possibility highlights the need for additional research in the practical and objective measurement of quality.

Regardless of the measure, it should apply to all hospitals. In our approach, higher levels

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of provision of community benefits by investor-owned hospitals raise the bar associated with the benchmark nonprofit hospital. Higher levels of net earnings by for-profit hospitals also raise the bar for what the equivalent nonprofit would be expected to do. This approach allows us to steer clear of some of the murky issues of motivations and objectives and to concentrate on what actions are done, not on why people say they do them.

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NOTES

1. P.A. Samuelson,"The Pure Theory of Public Expenditure," *Review of Economics and Statistics* 36, no. 4 (1954): 387–389.
2. A public good is one whose consumption is nonexcludable and/or nonrival. Nonexcludability refers to a situation in which people who benefit from a good cannot, at a reasonable cost, be excluded from those benefits even when they pay nothing. For example, spraying for disease-carrying mosquitoes provides benefits for all persons who live in the area. Nonrivalry refers to the situation where adding one additional consumer who uses the average amount of the good does not displace an equivalent amount of consumption from other users. An additional person watching television, for example, does not reduce or affect the consumption of existing viewers or require any additional resources.
3. Uncompensated care is the sum of charity care and bad debt. Charity care includes services where a bill is generated but a hospital never expects to be reimbursed. Bad debt is the proportion of a bill that a hospital attempts but is unable to collect. In practice it is difficult to differentiate between these two types of care.
4. J.P. Clement, D.G. Smith, and J.R.C. Wheeler, "What Do We Want and What Do We Get from Not-for-Profit Hospitals?" *Hospital and Health Services Administration* (Summer 1994): 159–178.
5. Nonprofit hospitals can retain profits but cannot distribute those profits to shareholders.
6. Return on equity is equal to a firm's net income divided by its accounting (book) value of equity.
7. W.M. Gentry and J.R. Penrod, "The Tax Benefits of Not-for-Profit Hospitals," NBER Working Paper no. 6435 (Cambridge, Mass.: National Bureau of Economic Research, February 1998).
8. Prospective Payment Assessment Commission, *Medicare and the American Health Care System: Report to Congress* (Washington: ProPAC, 1996).
9. A hospital's equity, or fund balance, is equal to the book value of its assets minus short- and long-term liabilities. Therefore, the return on equity is a broader measure of financial performance than is the return on assets because the former examines how well a firm manages its liabilities as well as its assets.
10. ProPAC, *Medicare and the American Health Care System.*
11. Medicare Payment Advisory Commission, *Report to the Congress: Medicare Payment Policy* (Washington: MedPAC, 1998).
12. K.E. Thorpe, "The Use of Regression Analysis to Determine Hospital Payment: The Case of Medicare's Indirect Teaching Adjustment," *Inquiry* (Summer 1988): 219–231; and S.H. Sheingold, "Alternatives for Using Multivariate Regression to Adjust Prospective Payment Rates," *Health Care Financing Review* (Spring 1990): 31–41.
13. Our recommended approach for measuring Medicare and Medicaid shortfalls differs from most existing methods. We focus on the opportunity cost of admitting Medicaid and Medicare patients relative to privately insured patients rather than the difference between the Medicare and Medicaid price and treatment cost. We assume that if a Medicare (or Medicaid) patient were not admitted, a patient with private health insurance would take his or her place; the traditional method assumes that if a Medicare (or Medicaid) patient were not admitted, the bed would be vacant.
14. Clement et al., "What Do We Want?"
15. E.B. Keeler, G. Melnick, and J. Zwanziger, "The Changing Effects of Competition on Non-Profit and For-Profit Hospital Pricing Behavior," *Journal of Health Economics* 18, no. 1 (1999): 69–86.

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HEALTH POLICY

Comparison of Hospital Costs and Length of Stay for Community Internists, Hospitalists, and Academicians

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BACKGROUND: The model of inpatient medical management has evolved toward Hospitalists because of greater cost efficiency compared to traditional practice. The optimal model of inpatient care is not known.

OBJECTIVE: To compare three models of inpatient Internal Medicine (traditional private practice Internists, private Hospitalist Internists, and Academic Internists with resident teams) for cost efficiency and quality at a community teaching hospital.

DESIGN: Single-institution retrospective cohort study.

MEASUREMENTS AND MAIN RESULTS: Measurements were hospital cost, length of stay (LOS), mortality, and 30-day readmission rate adjusted for severity, demographics, and case mix. Academic Internist teams had 30% lower cost and 40% lower LOS compared to traditional private Internists and 24% lower cost and 30% lower LOS compared to private Hospitalists. Hospital mortality was equivalent for all groups. Academic teams had 2.3–2.6% more 30-day readmissions than the other groups.

CONCLUSIONS: Academic teams compare favorably to private Hospitalists and traditional Internists for hospital cost efficiency and quality.

KEY WORDS: hospitalist; medical care costs; academic medicine.
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INTRODUCTION

The inpatient medical care model has been rapidly evolving at many urban medical centers.[1,2] Hospitalists and hospital-based physicians are assuming a larger proportion of inpatient care because of evidence of improved efficiency of inpatient care compared to traditional combined inpatient and outpatient practice.[3,4] Recently, academic Hospitalists were shown to have equivalent or lower hospital costs than private Hospitalists or traditional practices.[5–7] The optimal design of inpatient medical practice is not yet established and may well vary for different hospitals.

We report our experience at a community teaching hospital with several private Hospitalist groups, traditional private practice, and an academic physician group with resident physician teams. Our analysis covers nearly 4 years and compares hospital cost, length of stay (LOS), hospital mortality and 30-day readmissions among three types of physicians: private Hospitalists, traditional General Internist practice, and a hospital-based academic practice group with resident physicians.

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METHODS

Study Setting

The study was conducted at a large (500+ bed), urban, not-for-profit, community teaching hospital in Florida. The study began October 1, 2000, and ended June 30, 2004. This beginning timeframe corresponded to the conclusion of a prior study[3] and to the availability of severity categories in the data set. The ending corresponded to the end of the academic year. The study population consisted of all patients admitted to an Internal Medicine physician at the hospital. The hospital has residencies in categorical Internal Medicine, Medicine–Pediatrics, Pediatrics, General Surgery, Orthopedics, Obstetrics and Gynecology, Emergency Medicine, and Pathology. There were no Internal Medicine fellowships. There were 57,174 admissions to Internal Medicine physicians, of which 46,094 were to Hospitalists, General Internists, or academic physician teams during the time frame of the study.

Physician Groups

Community General Internists (Generalists). Fifty-two Generalists admitted to the hospital and served as attending physicians for at least ten or more patients during the study period. Nearly all were in solo or small group practices of varying size. The Generalists organized their own arrangements among each other for night and weekend coverage, but usually admitted and did their own daily hospital rounds on their own patients. Resident physicians did not provide any nonemergency care to the patients of Generalists.

Private Hospitalists (Hospitalists). Forty Hospitalists admitted ten or more patients to the hospital during the study period.

They were organized into seven groups with sizes varying from two to ten physicians. No group was exclusively practicing at the study hospital. The groups varied in size and number over the study years, and some physicians moved from one group to another during the time frame. No group or physician was employed by the hospital. The physicians provided hospital care to patients from local physicians who either did not practice in any hospital or did not practice at the study hospital.

The Hospitalist groups each provided care to patients 24 hours per day, but none provided in-house, 24-hour physician presence. Most groups had nurse practitioners or physician assistants to assist in hospital care. Resident physicians did not provide any nonemergency care to the patients of Hospitalists.

Academic Internists (Academicians). Ten full-time, hospital-employed Academicians provided care to inpatients and outpatients in conjunction with the Internal Medicine Residency Program. All had at least ten inpatient admissions during the study period. There were usually 24 Internal Medicine residents and eight Medicine–Pediatric residents in the program.

The Academicians all participated in the inpatient and outpatient care of patients in conjunction with the residents. All inpatients were admitted to one of the four resident physician ward teams, consisting of one second- or third-year resident, two first-year residents, and an attending physician. All Academicians supervised the residents in outpatient care and provided care to their own panel of outpatients. Academicians had ward teams from 1–12 months per year. The number of inpatient months of responsibility was determined by the choice of the Academician. All Academicians had concurrent outpatient resident supervisory (20–40% of total time), private outpatient practice (20–50% of total time), and program administration (10–30% of total time) responsibilities.

Physician–Hospital Relationships. There were no financial relationships between the hospital and the Generalists or Hospitalists during the study period. Academicians were employed by the hospital. The hospital did not provide a financial inducement or incentive to any physician or group related to efficiency of hospital care or with regard to the admission or discharge of patients.

Generalists and Hospitalists were responsible for all of their own billing for services to their patients. The hospital provided billing services for all Academicians' patients. The hospital did not own or have control over medical facilities related to the discharge care of patients. The hospital owned and controlled the predominant visiting nurse service.

Data Source and Collection

Trendstar Clinical Costing Software (McKesson HBOC, San Francisco, CA, United States) was used to collect information on all hospitalized patients for the duration of the study. Trendstar uses an activity-based cost accounting system derived from the hospital's ledger.[8,9] Costs are then reported, including direct, indirect, fixed, and variable costs.

Patients were grouped using all patient refined diagnosis related group (APRDRG), severity level (1–4), and risk-of-mortality (ROM) level.[1–4] APRDRG is assigned based on principal and secondary diagnosis, age, and procedure.[10] The severity level and ROM are then assigned within the APRDRG based on diagnoses and procedures. All costs were assigned to the single attending physician of each hospital admission. Costs generated by consultants or by resident physicians were assigned to the single attending physician throughout the hospitalization episode.

Study Patients

All APRDRGs with more than 200 cases total and at least 50 cases in each physician group during the study period were included in the analysis. The study was limited to patients with Medicare, Medicaid, or commercial insurance. Procedural-based APRDRGs were excluded. High-frequency APRDRGs were selected for analysis to assure that statistical adjustment for severity of illness and other confounding factors could be done among all physician groups. Uninsured patients (4,595) were excluded because they were almost exclusively seen by Academicians, precluding comparisons among the three physician groups for this category of patients. There were 22,972 admissions that met these criteria. All patients were admitted to the same hospital units. The intensive care units (ICU) were of "open" design. The attending physician did rounds in the ICU and sought consultation with specialists as needed. The study was approved by the organization's institutional review board prior to any investigation.

Study Design and Statistical Analysis

The study design was a retrospective cohort design. The period of the study was October 1, 2000, through June 30, 2004. The primary endpoints were hospital cost (cost) in dollars, LOS in days, readmission to the hospital within 30 days, and hospital mortality. Secondary endpoints were pharmacy costs, imaging costs, laboratory costs, supply costs, and respiratory therapy costs. Endpoints were calculated per hospital admission. Physician fees were not included in costs. Costs were controlled for inflation by introduction of an adjustment factor for year of study into the multivariate analysis. This assures that costs are equally compared among physician groups over the entire study period. Readmissions within 30 days of hospital discharge were attributed to the original discharging physician regardless of who admitted the patient secondarily. Demographic information collected on each case included age, gender, race (white, black, Hispanic, other), and health insurance coverage (Medicare, Medicaid, commercial/HMO).

The statistical analysis was done using SAS 9.1 (SAS Institute, Cary, NC, United States). Because of skewness and nonnormality, costs and LOS were log-transformed prior to analysis. The highest and lowest 0.5% cost admissions were removed as outliers prior to analysis. General linear modeling (GLM) was used to adjust for differences in confounding variables for cost and LOS endpoints. For mortality and 30-day readmissions, logistic regression analysis was used to control for confounding factors. Cost, LOS, hospital mortality, and 30-day readmissions were dependant variables; age was a continuous independent covariable and other independent variables (gender, race, APRDRG, insurance, year of admission, severity category, ROM, and physician group) were categorical variables. Severity category was nested within the

APRDRG. ROM was only utilized in the mortality model. Statistically significant factors (independent variables) in the regression models were determined using stepwise automatic variable selection procedures. Age and physician group were always contained in the model. Statistical significance was set at $P<.05$ for confounding variables to remain in the models. Pair-wise comparisons of physician groups within the GLM model were analyzed using *t* tests with Tukey's adjustment for multiple comparisons.

RESULTS

Table 1 reveals the basic demographic characteristics of the patients in the three physician groups. The patients differ in basic demographic characteristics. The Generalists' patients were older, more likely to have Medicare, and more likely to be white than the other groups. The Academicians' patients were younger, more likely to have Medicaid, and more likely to be black than other groups. There were small differences in the frequency of APRDRGs among the physician groups. There were no significant differences in severity level among the physician groups.

Table 2 provides basic characteristics of the three physician groups. All groups were 100% certified by the American Board of Internal Medicine. Generalists were further from medical school graduation, were more likely to be international graduates, and had fewer admissions per year to the hospital than the other physician groups.

Table 3 displays the cost and LOS by physician group. Other than the unadjusted arithmetic mean values, all other values in Table 3 represent fully adjusted results of GLM models. Unadjusted arithmetic mean values of overall cost and LOS appeared to have differences among the physician groups. An adjusted analysis of log-transformed values of cost and LOS was performed with age, gender, race, APRDRG, insurance, year of admission, and severity (nested within APRDRG) as adjustment factors. The final models, after removal of nonsignificant factors, contained age, APRDRG, year of admission, severity, and gender for both cost and LOS models. Insurance was also significant in the LOS model. The R^2 was 0.36 for the cost model and 0.39 for the LOS model. The overall adjusted cost and LOS were statistically significantly lowest for Academicians and highest for Generalists. Subsequently, the least squares means of each statistically significant demographic factor, severity level, and admission year were reported after adjustment of all other factors. The results indicate highly consistent and statistically significant differences among the physician groups within each category of gender, insurance, severity, and year of admission. Academicians' overall adjusted cost and LOS were, respectively, 30.0 and 39.5% lower than Generalists and 24.37 and 29.7% lower than Hospitalists. Costs and LOS were more consistently lower for academicians compared to Generalists or Hospitalists for each category of

Table 1. Characteristics of Patients by Physician Group

Characteristic	Physician group			
	Generalist (*n*=5,536)	Hospitalist (*n*=11,565)	Academician (*n*=5,691)	*P* value*
Mean age ± SD	66.5±16.5	62.8±17.3	58.6±18.9	<.001
Female gender†	59.6	57.1	55.7	<.001
Ethnicity†				<.001
White	59.3	59.4	47.7	
Black	23.2	25.6	34.1	
Hispanic	13.9	12.5	13.8	
Other	3.7	2.5	4.4	
Insurance†				<.001
Medicare	67.9	58.8	50.7	
Medicaid	6.5	7.7	32.3	
Commercial/HMO	25.6	33.5	17.0	
APRDRG†				<.001
Neurological disorders 45,46,53,54	6.1	7.0	8.7	
Respiratory disorders 137,139–141, 144	14.4	14.0	17.0	
Cardiovascular disorders 190,194,197–199,201,204	32.9	30.9	27.5	
Chest pain 203	10.3	12.5	10.6	
Digestive diseases 241,243,244,247,249,251,253,254,282	16.2	15.0	13.7	
Musculoskeletal disorders 347,351	3.2	3.3	2.7	
Skin infection 383	2.3	2.7	3.2	
Diabetes 420	1.9	1.8	3.7	
Disorders of electrolytes 422,425	3.0	2.9	3.2	
Renal failure 460	2.3	2.6	2.1	
UTI 463	3.7	3.8	4.5	
Anemia 663	1.6	1.2	1.2	
Septicemia 720	2.2	2.4	2.0	
Severity level†				
1	27.9	28.0	28.6	0.752
2	47.5	47.0	47.4	
3	21.5	21.3	20.8	
4	3.2	3.7	3.1	

APRDRG = all patient refined diagnosis related group
**Chi square tests were used for categorical variables and one-way ANOVA for age*
†*Percent*

Table 2. Characteristics of Physicians by Group

Characteristics	Physician group		
	Generalist (*n*=52)	Hospitalist (*n*=40)	Academician (*n*=10)
Years since medical school graduation, mean (range)	16.4 (2–38)	7.8(1–23)	12.0 (1–26)
Board certified (%)	100	100	100
International graduate (%)	59.6	37.5	20.0
Admissions per physician per year mean ± SD	36.2±33.9	97.2±132	162.6±124.1
Employed by hospital (%)	0	0	100
Work with residents (%)	0	0	100

gender, insurance type, severity level, and year of study. In general, Hospitalists' costs and LOS were lower than those of Generalists (7.5 and 14.0%, respectively, overall) and in most categories of gender, insurance status, severity level, and year.

Table 4 gives the results of the secondary cost endpoints of the study: pharmacy, laboratory, imaging, supply, and respiratory therapy costs. Academicians' costs were lowest, especially in pharmacy costs. The costs are unadjusted average costs because a suitable transformation could not be found to allow for statistical analysis of the data. Consistent with the overall cost analysis, academicians had lower costs than Hospitalists or Generalists for pharmacy, imaging, supply, and respiratory therapy.

Table 5 displays the results of hospital discharge status and hospital mortality and 30-day readmissions. Academicians had a greater proportion of discharges to nursing homes and hospice than the other groups. Adjusted odds ratios of hospital mortality rates did not differ among the physician groups.

Readmissions within 30 days were more frequent for Academicians than the other groups. Unadjusted readmissions were 2.3–2.6% more frequent for Academicians than for Hospitalists or Generalists. After adjustments for confounding factors, Academicians' odds of readmission were about 0.2 greater than those of Hospitalists or Generalists, a difference that was statistically significant. Confounding factors that were significantly associated with readmission rates in the logistic regression analysis were APRDRG, ethnicity, and insurance type. Whites, blacks, and Hispanics were, respectively, 1.64 [confidence interval (CI) 1.16–2.32], 1.81 (CI 1.28–2.57), and 1.40 (CI 0.97–2.02) times more likely than the "other" group to be readmitted. Also, commercial insurance patients and Medicaid patients were, respectively, 0.46 (CI 0.39–0.55) and 1.00 (CI 0.84–0.18) times as likely as Medicare patients to be readmitted.

We analyzed the effect that readmissions had on cost and LOS. We wanted to be sure that the apparently lower

Table 3. General Lineal Model Regression Analysis of Admission Cost and Length of Stay by Physician Group and Subject Characteristic; Percent Difference and Statistical Significance by Physician Group Pairs

	Physician group						Physician group pairs*					
	Generalist (*n*=5,536)		Hospitalist (*n*=11,565)		Academician (*n*=5,691)		Hospitalist–Generalist		Academician–Hospitalist		Academician–Generalist	
	Cost	LOS	Cost	LOS	Cost	LOS	Cost	LOS	Cost	LOS	Cost	LOS
Unadjusted arithmetic mean	4,814.3	4.4	4,613.9	3.9	3,307.4	2.7	−4.2	−18.2	−28.3	−30.8	−31.1	−38.6
Adjusted overall† geometric mean	4,761.3	4.3	4,402.5‡	3.7‡	3,333.8§	2.6§	−7.5	−14.0	−24.3	−29.7	−30.0	−39.5
Gender†												
Female	4,854.6	4.4	4,438.3‡	3.8‡	3,330.5§	2.7§	−8.6	−13.6	−25.0	−28.9	−31.4	−38.6
Male	4,643.3	4.0	4,365.9‡	3.6‡	3,343.8§	2.6§	−6.0	−10.0	−23.4	−27.8	−28.0	−35.0
Insurance†												
Commercial	–	4.0	–	3.5‡	–	2.9§	–	−12.5	–	−17.1	–	−27.5
Medicaid	–	4.2	–	3.8‖	–	2.7§	–	−9.5	–	−28.9	–	−35.7
Medicare	–	4.4	–	3.8‡	–	2.6§	–	−15.8	–	−31.6	–	−40.9
Severity†												
1	2,694.7	2.5	2,542.2‡	2.2‡	2,115.4§	1.8§	−5.7	−12.0	−16.8	−18.2	−21.5	−28.0
2	3,629.2	3.4	3,339.3‡	3.0‡	2,534.7§	2.1§	−8.0	−11.8	−24.1	−30.0	−30.2	−38.2
3	5,622.5	5.2	5,111.8‡	4.5‡	3,473.1§	2.9§	−9.1	−13.5	−32.1	−35.6	−38.2	−44.2
4	9,543.1	6.9	8,893.3¶	6.8#	5,731.3§	3.7§	−6.8	−1.4	−35.6	−45.6	−40.0	−46.4
Year†												
1	4,339.2	4.1	4,011.7‡	3.6‡	3,138.0§	2.7§	−7.5	−12.2	−21.8	−25.0	−27.7	−34.1
2	4,610.0	4.3	4,226.5‡	3.8‡	3,242.4§	2.7§	−8.3	−11.6	−23.3	−28.9	−29.7	−37.2
3	4,877.0	4.3	4,610.5**	3.7‡	3,390.5§	2.5§	−5.5	−14.0	−26.5	−32.4	−30.5	−41.9
4	5,311.6	4.3	4,788.6‡	3.7‡	3,539.9§	2.7§	−9.8	−14.0	−26.1	−27.0	−33.4	−37.2

LOS = length of stay

**Percent difference between mean pairs calculated as (Physician[1] − Physician[2] / Physician[2])100.*

†Least squares means from general linear model of log-transformed cost and LOS adjusted for age as covariate, gender, insurance, year, all patient refined diagnosis related group (APRDRG), and severity nested in APRDRG. Ethnicity was not significant (P>.05) in cost or LOS model. Insurance was not significant in cost model

‡Hospitalist lower than Generalist at P<.001

§Academician lower than Generalist and Hospitalist each at P<.001

‖Hospitalist lower than Generalist at P=.25

¶Hospitalist lower than Generalist at P=.51

#Hospitalist lower than Generalist at P=.92

***Hospitalist lower than Generalist at P=.12*

utilization by academic teams was not simply dilution of average costs by more frequent admissions. We combined all readmissions within 30 days into one combined admission and reanalyzed the data using the same adjustment process as described earlier. The overall adjusted cost for the Hospitalists, Generalists, and Academicians were, respectively, 4,617.4, 4,988.1, and 3,615.5. The overall adjusted LOS for the Hospitalists, Generalists, and Academicians were, respectively, 3.9, 4.4, and 2.8. Each of the values of cost and LOS are statistically significantly different at $P<0.001$. The effect of the readmission differences is therefore minimal with regards to cost efficiency.

DISCUSSION

The emergence of Hospitalists represents a significant change in the care of hospital patients. Whereas the optimal strategy for hospital-based medicine is still evolving, evidence is mounting that academic, hospital-based physicians with resident physician teams can be very efficient providers.

Our study supports and expands upon earlier reports of reduced hospital costs and LOS by academic physicians with residency teams.[5,6] Our study includes more patients and covers a longer period of time than other studies. There was internal consistency in the data with costs and LOS reductions following a similar pattern through all demographic, severity, and admission year categories. We also found that, as in other studies,[3,5] private Hospitalists were modestly more efficient than community General Internists in the care of inpatients.

Although mortality was equivalent among all physician groups, hospital readmissions were modestly increased for patients in the academic physician category. All three groups' readmission rates were similar to or lower than those reported in other studies.[4–7,11] The reason for the differences is unclear but might be in part caused by the lower socioeconomic status of the academic physician group patients compared to that of the other groups. We could only evaluate readmissions to the hospital where the research was conducted. We do not know how frequently patients were admitted to other area hospitals, a potential problem in all research of this type reported to date.

We can only speculate on the reasons for lower inpatient costs and LOS for academic physician teams. Each team consisted of multiple physicians who could attend to patient social and medical needs and collect needed information more rapidly than the other physician types. One or more team members were present continuously in the hospital for at least 10 hours each day, and the care was "handed off" to an on-call team for the remaining hours. Neither Hospitalists nor Generalists maintained this level of hospital presence.

Table 4. Unadjusted Average Pharmacy, Laboratory, Imaging, Supply, and Respiratory Therapy Costs per Admission by Physician Group

Type of cost	Physician group		
	Generalist	Hospitalist	Academician
Pharmacy*	646.4	634.7	419.6
Laboratory*	448.2	416.2	405.1
Imaging*	342.3	334.7	276.6
Supply*	91.1	92.1	59.1
Respiratory therapy*	95.4	79.7	52.6

Unadjusted average cost in dollars per admission

Table 5. Discharge Status and Logistic Regression Analysis of Hospital Mortality and 30-day Readmissions by Physician Group

Discharge/ readmission status	Physician group		
	Generalist	Hospitalist	Academician
Hospital mortality (%)	2.2	2.3	2.1
Home (%)	84.1	83.7	79.6
Hospice (%)	0.3	0.5	0.6
Nursing home (%)	12.5	12.1	16.0
Other (%)	0.8	1.4	1.7
30-day readmission (%)	7.5	7.2	9.8
Adjusted hospital mortality OR (CI)*	0.89 (0.68–1.16)	1.02 (0.81–1.28)	1.0
Adjusted 30-day readmission OR (CI)†	0.78 (0.68–0.90)	0.79 (0.70–0.88)	1.0

**OR (CI)=odds ratio and 95% confidence intervals of logistic regression analysis adjusted for age, all patient refined diagnosis related group (APRDRG), and gender*
†OR (CI)=odds ratio and 95% confidence interval adjusted for age, ethnicity, insurance, and APRDRG

Familiarity with the hospital environment and resources could potentially play a modest role in hospital efficiency. Academic physicians had the most patients and Generalists had the least patients per year. We performed an analysis that examined the effect of each individual attending physician's yearly admission volume on cost and LOS. There was a statistically significant ($P<.001$) inverse relationship between cost and LOS and admission volume per attending. However, the effect was small (R^2 gain<2%).

Our study has several strengths. It is the largest study reported to date comparing academic physician teams with other Hospitalists and Internists. The data reported are internally consistent across a spectrum of demographic and severity categories. The data relating to academic physician teams are supported by prior studies in other geographic areas.[5,6]

Our study has limitations, which we acknowledge. The study is from one hospital and academic setting. The results may not necessarily be generalized to other settings. We are confident in the accuracy of hospital costs, LOS, hospital mortality, and physician data, but we do not know global health care costs of the patients. Costs could have been differentially shifted to other settings by one group of physicians more than others. We also realize that statistical adjustment of differences in demographic factors has limitations in accuracy. We were not able to adjust the subcategories of cost (pharmacy, laboratory, images, and supply and prescriptions) for confounding factors. Thus, these data should be interpreted with caution. Finally, the higher rate of readmission by academic physicians could potentially indicate a deficiency in discharge planning or a difference in alternative health care access by Academicians' patients compared to other groups' patients.

Conclusion. The type of hospital physician provider can have a dramatic effect on hospital costs and LOS. The current and projected rise of Medicare, Medicaid, and uninsured

populations characterized by fixed payment or very low payment will likely place increased economic pressure on hospital managers to seek the most cost-effective inpatient providers. Future research should be done to better delineate total health care costs within specific geographic areas to evaluate the quantity of cost shifting that is occurring between inpatient, outpatient, and long-term care facilities. Also, objective quality-of-care markers, in addition to mortality, are needed to compare the true efficiency of health care providers.

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Sounding Board

The Social Missions of Academic Health Centers

ACADEMIC health centers have long enjoyed positions of power and prestige in the health care system. However, the restructuring of health care — exemplified by the spread of competition and managed care — threatens the intricate system of financial and clinical relations on which these institutions depend.[1,2] Although these challenges have led to considerable discussion about the appropriate role of academic health centers and how they should be organized and financed, a fundamental question is generally overlooked: Why are academic health centers worth our concern and protection? More specifically, is there any reason they should not be left to face the competitive forces that currently determine winners and losers throughout our economy, including the health care sector? A clear understanding of the rationale (or lack thereof) for the special treatment of academic health centers may prove essential to the formulation of wise public policy during this critical period in the history of these centers.

In our view, the rationale rests on the observation that competitive markets alone are unable to produce certain types of socially valuable goods and services effectively or efficiently. Applying this rationale to the work of academic health centers, we identify activities — their "social missions" — that are likely to be undersupplied in competitive markets and that constitute the primary reason for the public support of academic health centers.

We define an academic health center as one of the 125 institutions in the United States that consist of at least a medical school and an owned or closely affiliated clinical facility in which faculty instruct physicians-in-training. These centers classically conduct teaching, patient care and, in many cases, research. They may, and often do, contain additional components, including schools for other health professions (schools of nursing, pharmacy, dentistry, and the allied health professions) and other clinical entities (faculty group practices, community health centers, nursing homes, and increasingly, community-based networks of practitioners). For the purposes of this discussion, however, we do not consider these other components essential for an institution to qualify as an academic health center. Also, we recognize that academic health centers vary considerably in the competitiveness of their local markets, their ownership status (public vs. private), size, institutional reputation, financial status, and other factors. These characteristics may lead to variation in mission-related activities from one center to another.

THE ACTIVITIES OF ACADEMIC HEALTH CENTERS

Academic health centers provide two distinct kinds of goods and services: those that can be effectively and efficiently provided and distributed in private markets and those that cannot. Because they provide health care goods and services for which private markets exist, critics sometimes advocate forcing them to compete on the basis of price and quality, just like any other private provider of health care services, educational products, or research-based goods and services. However, this argument overlooks the other goods and services provided by academic health centers that are impractical to distribute through traditional market mechanisms. We refer to the activities related to providing these special goods and services as the social missions of academic health centers.

Training

Academic health centers perform several training functions that have social value and that entail added costs that cannot be recouped during the course of market transactions. The most visible of these training functions is the education of new physicians.

Medicine is unique among the professions in that medical school–accrediting agencies, governmental boards of medical licensure, and professional societies that credential physicians all require physicians to participate in extensive periods of applied clinical training at both the undergraduate and postgraduate level. These requirements serve to protect consumers, by recognizing that because of limitations in their knowledge of medicine, many patients benefit from public and private regulations ensuring that licensed and credentialed physicians have at least a minimal level of technical competence.

Academic health centers have borne a disproportionate share of the costs associated with this publicly mandated service. Providing trainees with the necessary clinical experiences raises the costs of patient care, because trainees take longer to perform routine patient care tasks, use more diagnostic and therapeutic services, and require faculty supervision. In a competitive market, it is extremely difficult for academic health centers to recoup the costs associated with this consumer-protection function, because price-sensitive purchasers tend to patronize cheaper institutions.

The consumer-protection role of academic health centers is a compelling reason for public support of the costs of undergraduate and graduate medical education. However, a comparable rationale does not exist for all their training functions. Academic health centers can provide some educational activities ef-

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fectively under market conditions. For example, academic health centers offer profitable continuing-medical-education services to physicians and other health professionals. It seems likely and desirable that academic health centers will reach agreements with some managed-care organizations and other providers to supply particular training services to their physicians in return for fair compensation. Instead of requiring external subsidies, these training and educational functions constitute opportunities to generate additional revenues to support the less self-sustaining social missions of academic health centers.

Research

There is widespread acceptance of the fact that competitive markets do not support socially optimal amounts of basic research, because the economic benefits of such work are uncertain and can rarely be fully realized by those who pay for it. One reason academic health centers have assumed a prominent role in conducting basic health research is that its primary purpose is to develop knowledge applicable to human illness. Basic research is more likely to produce knowledge that has practical benefits when potential users — physicians and other care givers — participate in the research or interact with the investigators conducting it.[3,4] Such interaction occurs naturally in academic health centers, which have proved able to attract and retain both fundamental investigators and physicians interested in translating new knowledge into new clinical applications.

Besides basic research, academic health centers conduct certain types of applied research likely to be undervalued and undersupplied under market conditions. For example, much clinical research offers major potential public benefits but has little attractiveness in private markets because the intellectual property that results is not protected by existing intellectual-property statutes.[5] Such clinical research includes refining surgical techniques, developing new diagnostic and therapeutic regimens that innovatively combine existing treatments, and conducting clinical trials comparing the efficacy of off-patent medications.

However, academic health centers also conduct applied research and development that may be supplied effectively and efficiently under market conditions. This is typically the case when the work leads to the production or marketing of intellectual property protected through patents or copyrights. Because private industry has proved willing to support this type of research,[6] it seems appropriate for academic health centers to compete with other research organizations (such as industrial laboratories and contract research organizations) to attract such support.[6,7] It was estimated that in 1994 life-science companies provided about 12 percent of all the funds for life-science research in academic institutions.[6]

Patient Care

Academic health centers fulfill several social missions related to patient care. The policy rationale for supporting academic health centers in this work varies somewhat depending on the type of service provided. First and foremost, academic health centers — especially publicly owned facilities — provide a disproportionate amount of care to poor and uninsured people. Their role in the care of indigent people stems partly from their location in densely populated urban areas and partly from a traditional institutional commitment to providing care for the poor and uninsured.

The justification for public support of this function rests largely on considerations of ethics and equity, but one may also argue that providing care to poor and uninsured people has value to more fortunate people that is not captured in market transactions. Many people who do not benefit directly from such care nevertheless value its availability, since they are comforted by the knowledge that free care would be available if they were to need it. Left to their own devices, markets therefore provide less than the socially optimal amount of care to vulnerable people.

Academic health centers also provide disproportionate amounts of certain unprofitable but necessary services. These include highly complex trauma care, burn care, care for patients with AIDS, and intensive care for patients with multisystem failure. Such services may lose money for a number of reasons, including the fact that the patients who use them often exhaust insurance coverage and that the costs of providing highly specialized or innovative services exceed insurance payments. Though hospitals in academic health centers make up only 2 percent of all nonfederal community hospitals in the United States, they have 33 percent of the nation's trauma units, 31 percent of its dedicated AIDS units, and 50 percent of its burn units.[8,9] The availability of these services is determined in part by the ability of academic health centers to underwrite their costs. If left unsupported, however, academic health centers in selected markets may stop providing such services, leaving the patients who need them without a readily accessible source of care.

Obviously, academic health centers provide many primary, secondary, and tertiary services that can be sold to paying customers and that are also provided competently by nonteaching institutions. A compelling case can be made that to increase efficiency or to improve the quality of services, academic health centers should compete with nonacademic institutions for customers seeking these services.

Policy makers should be aware, however, that such competition may have unintended effects on the ability of academic health centers to provide the goods and services, such as those discussed above,

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that are ill suited to distribution in a free market. To varying degrees, the capabilities of academic health centers in the areas of teaching, research, standby provision of highly specialized services, and care of vulnerable populations depend on their continued involvement in providing primary, secondary, and tertiary care.[10] Thus, even when the patient care services of academic health centers seem to resemble those of nonacademic competitors, subjecting them to the rigors of competitive markets may indirectly affect their ability to serve other social missions.

FINANCING THE SOCIAL MISSIONS

The role of academic health centers in compensating for market inadequacy has evolved, like most of our health care system, rather haphazardly. This is illustrated in the way academic health centers finance their mission-related activities. Some of these are supported directly by a wide variety of programs run by multiple agencies at multiple levels of government. The federal government funds biomedical research through the National Institutes of Health, the National Science Foundation, and the Department of Veterans Affairs.[11] Through Medicare, Medicaid, and other programs, federal, state, and local tax dollars fund care of the indigent in public and private hospitals affiliated with or owned by academic health centers. The federal government subsidizes professional training through Medicare as well as through direct grants to teaching institutions, and state governments subsidize medical education through appropriations to public universities and through Medicaid supplements.[12]

Academic health centers have also developed indirect mechanisms for funding goods and services that are difficult to produce in a free-market economy. Historically, academic health centers and other training institutions have recouped a portion of the costs of their social missions by charging paying customers prices that are 15 to 30 percent above the community average.[13] However, whether these clinical cross-subsidies of social missions can be sustained in competitive markets is questionable, and threats to these indirect financing mechanisms constitute the most immediate cause for concern over the future of the social missions of academic health centers.

Many academic health centers are already responding to the changing environment by undertaking major reforms in their management and organizational structures and by aggressively reducing their costs. However, these changes may not be sufficient to allow them to compete with community hospitals and continue to fund their social missions from patient care revenues. Given the nature of markets and of the mission-related goods and services provided by academic health centers, a reduction in the amount or quality of their mission-related activities seems inevitable unless government acts to sustain those missions. The goal of public policy in this area should be to protect the social missions of academic health centers without protecting them from having to compete on the basis of price and quality in the provision of goods and services that can be effectively supplied and distributed by the private sector.

A logical way to accomplish this goal would be the creation of a federal trust fund dedicated to the support of the social missions of academic health centers. Such a trust fund could be financed in a variety of ways, including contributions from the Medicare and Medicaid programs (drawing on current payments for graduate medical education), general revenues, and a tax on private insurance payments. Trust-fund dollars could then be distributed to all institutions that educate physicians and conduct research (including organizations other than academic health centers where appropriate) and that also provide or participate in patient care. Ideally, payments would be proportionate to the amount of activities, such as education and research, that were conducted by academically affiliated institutions and the associated patient care costs attributable to the fulfillment of the social missions. Designing fair and efficient payment formulas would require the collection and analysis of additional data concerning the extent and costs of these social missions, and this should be a priority.

ISSUES OF ACCOUNTABILITY

The creation of new mechanisms for supporting the social missions of academic health centers financially raises inevitable questions about how to hold them accountable for the support. Critics believe that the lack of accountability of academic health centers in the past has resulted in their producing too many or the wrong types of goods and services. For example, the Pew Commission on Medical Education concluded that academic health centers are training too many physicians for society's needs.[14] Some policy makers also believe that academic health centers influence young physicians to become specialists rather than primary care physicians and thus contribute to an imbalance between specialty and primary care in the United States.

The appropriate method for holding academic health centers and other institutions accountable for their publicly supported social missions is likely to vary according to the type of mission, type of organization, level of government, and geographic region. However, three points are worth emphasizing in this regard. First, academic health centers must expect increased scrutiny if they receive additional public funds earmarked to support teaching, research, and some forms of patient care. Second, in exchange for such support, academic health centers must demonstrate their willingness and ability to respond to public needs (such as the preparation of physicians

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for ambulatory practice in managed-care environments); improve the efficiency of their teaching, research, and patient care activities; and institute comprehensible accounting systems that allow public officials to identify the sources and uses of their funds more readily. Third, in designing new mechanisms of accountability, policy makers should avoid imposing regulations that reduce the efficiency or effectiveness of the mission-related activities of academic health centers. To do so will require careful study of the effects of any new programs on the productivity of academic health centers in the areas of teaching, research, highly specialized services, and care of vulnerable populations.

CONCLUSIONS

A convincing rationale exists, we believe, for continuing to protect the social missions of academic health centers from the full force of unfettered markets. In return, however, academic health centers and any other institutions that pursue these protected functions must embrace reforms that many will find difficult. The formulation of wise public policy will depend on the improved collection and analysis of data to track the effects of this changed environment on the valued social missions that academic health centers have served in the past.

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Special Article

Indirect Institutional Revenue Generated From an Academic Primary Care Clinical Network

John W. Saultz, MD; Gregg McCarty; Benjamin Cox, MBA; David Labby, MD, PhD; Robert Williams, MBA; Scott A. Fields, MD

Background and Objectives: *As the financial performances of US academic health centers have faltered under managed care and the Balanced Budget Act of 1997, increasing attention has been paid to the costs and benefits of operating primary care networks. This study examines the indirect revenues to a university hospital and faculty group practice that result from such a primary care network using a method of abstracting billing data.* Methods: *A primary care patient cohort was identified by selecting all patients who generated at least one charge in any of the 10 primary care clinics in the network over a 15-month period. All charges from the hospital and the faculty practice group for this cohort were then examined during a 6-month period, and the total charges generated in the primary care setting were compared with charges generated elsewhere in the health system.* Results: *The primary care patient cohort included 56,459 patients and generated a total of $7,243,312 in charges for primary care services, $43,559,741 of charges in the hospital billing system for non-primary care services, and $8,825,611 of charges for services from specialty faculty. This cohort accounted for 18.5% of the gross charges for hospital care and 17.6% of charges generated by the specialty physicians.* Conclusions: *Using a simple and replicable methodology, this study estimates a substantial financial benefit to the hospital and specialty practices from a primary care network.*

(Fam Med 2001;33(9):668-71.)

Many US health care institutions are experiencing difficult financial times. The past 10 years have witnessed a rapid decline in the rate of growth in health care spending even as the cost of operating hospitals and physician offices has continued to grow. Health insurers are under constant pressure to limit increases in the premiums they charge to employers and have transferred that pressure to physician groups and hospitals. In an effort to protect market share and improve efficiency, many hospitals and specialty physician groups have added primary care practices to become integrated health systems. In some cases, dozens of primary care practices and scores of physicians were added to these systems, with a substantial flow of capital to fund the enterprise. The idea behind these affiliations was to create a new type of organization to truly manage the cost and quality of care, but, in many cases, there was little institutional understanding of the financial realities of primary care practice. As the practice acquisitions took place, ancillary sources of revenue such as laboratory and radiology fees were removed from the primary care practices. Simultaneously, practice overhead costs increased dramatically as managed care coordinators and utilization managers were added, and expensive centralized systems were installed to manage such processes as patient registration and scheduling.

Nowhere have these trends been more evident than in academic health centers, where the added costs of medical education have become harder and harder to cover. Academic health centers seemed to be especially vulnerable to a market driven by integrated systems.[1-3] The typical academic health center of the 1990s had little primary care capacity to support a large tertiary care infrastructure. Thus, many such centers were particularly anxious to affiliate with or build primary care systems. An implicit financial assumption in doing so was that an initial investment of money in primary care would yield a self-sustaining new division of primary care in the newly integrated corporation.

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Things have generally not turned out as planned, however. The Balanced Budget Act of 1997 exacerbated the funding crisis in academic health centers, and many of these institutions are experiencing unsustainable financial losses.[4] At the same time, there is a growing sense that managed care delivered through vertically integrated health systems with primary care as gatekeepers is not likely to be a sustainable long-term answer to the problems of affordable health care.[5] Most institutions have found that an initial investment in primary care has become what appears to be an ongoing subsidy. Together, these new realities are causing a number of institutions to reexamine the strategies put in place in the early 1990s with regard to primary care. Entire consulting companies have been built for the purpose of advising health systems about how to stop the losses, and the economic viability of primary care practices is being scrutinized as never before.[6]

At Oregon Health Sciences University, the primary care clinical operation was expanded substantially from 1992–1997. During this period, seven off-campus clinical practices were added to our existing three on-campus clinics. Four of these clinics were started *de novo,* while three of the clinics were built on a foundation of one or two primary care providers. Five of these new clinics were in large buildings (approximately 15,000 square feet) and were designed to accommodate a substantial teaching load, while the remaining two were smaller community practices. Three of the clinics were established as family practice offices, one was exclusively pediatrics, and three were multidisciplinary and included general medicine, general pediatrics, obstetrics and gynecology, and, in one case, family practice. All of the clinics were involved in both resident and student teaching, and all of the providers were employed as faculty members in various primary care departments of the school of medicine. Between 1992 and 1999, the annual number of patient visits grew from approximately 57,000 to 188,000, and the annual gross charges grew from $4.5 million to $17.7 million per year. The payer mix by visit for the 10 clinics was 49% private insurance, 24% Medicaid, 18% Medicare, and 9% self-pay.

As the need to control costs grew, the institution became acutely interested in better understanding the net financial effect of its primary care network on the rest of the health system. While accurate information about the gross and net revenues of the clinics and about the direct costs of operating them was available, there was insufficient information about how the growing primary care system affected specialty clinics and the hospitals. Previous studies have reported on the indirect revenues to academic medical centers from primary care practices, but these studies used registration data from the primary care practices to identify the cohort for study.[7-10] In Oregon, the university's patient registration system could not accurately identify which patients were receiving care in the primary care system. Therefore, a methodology was developed using billing information alone to identify the primary care patient cohort and to estimate the financial effect of these patients on the university's health system.

Methods

The focus of this project was to determine the financial impact of the primary care system on the financial performance of the university's health system. To do this, a cohort of patients associated with the primary care clinics was identified, and total charges and net revenue from this patient cohort were measured. First, the primary care cohort included any patient who had at least one charge from any of the 10 primary care clinics between January 1, 1998, and March 31, 1999. A computer file was created in which these patients were identified by their unique medical record numbers. Next, a database of all charges generated by this patient cohort between October 1, 1998, and March 31, 1999, (a 6-month period) was extracted from the hospital billing system and from the billing system of the faculty practice group.

From these databases, all charges were sorted into two groups: those that were generated in any of the primary care clinics and those generated elsewhere in the health system. The non-primary care charges in the hospital's billing system included charges for inpatient care, emergency care, hospital charges generated in any of the specialty clinics, hospital laboratory or radiology department charges, and pharmacy charges at the hospital pharmacy. The non-primary care charges in the faculty practice group billing system included charges for specialty physician services. It was not possible to analyze any charges generated at laboratories, pharmacies, physician offices, or hospitals outside of the university's system. An estimated collection rate was calculated on these charges. Finally, the charges generated by the primary care cohort were compared with the total charges generated by all patients in the health system.

Results

A total of 56,459 patients had at least one charge generated in any of the 10 primary care practices between January 1, 1998, and March 31, 1999. This group of patients was identified as the primary care cohort.

During the 6-month study period (October 1, 1998–March 31, 1999), there was $239,429,497 in total hospital charges and $53,960,047 of total charges from the faculty practice group for all patients in the health system. Of these totals, $3,496,502 (1.5%) of hospital charges and $3,746,810 (6.9%) of practice group charges were generated in the primary care clinics. The hospital's billing system is used for primary care

delivered by residents, for office-based laboratory and X ray, and for faculty professional services in two of the primary care clinics. The practice group's billing system is used for the remainder of the primary care faculty professional services. Thus, by subtracting the primary care charges in each of the two billing systems, it was possible to determine charges for services rendered by the faculty practice group.The hospital billing system included $235,932,995 of charges for non-primary care services, and the faculty practice group posted $50,213,237 of charges for specialty physician services.

Table 1 lists the charges attributed to the primary care patient cohort during the same time period. The primary care patient cohort accounted for approximately 18.5% of the total charges for hospital care. Traditionally, about 44% of University Hospital's charges are for patients who live in metropolitan Portland. Thus, the metro area non-primary care charges totaled approximately $104 million, of which nearly 42% were from the primary care cohort. The specialty physician charges attributable to the primary care patient cohort were approximately 17.6% of the total charges for such care.

During the period of time examined by this analysis, the hospital's collection rate for all patients was approximately 64% of charges. The collection rate for charges from the primary care cohort was 61% during the same period.

Discussion

Several previous studies have examined the indirect revenue or "multiplier effect" from primary care practices.[7-10] This term was first used in a 1989 paper describing institutional revenues generated from a family practice clinic at the University of Washington.[7] In that report of the multiplier effect, Schneeweiss et al reported $6.40 of billed charges in the entire health system for every $1 of charges in a family practice clinic cohort.[7] This study was done in the 1980s and included both specialty clinic and hospital charges. Other studies have examined the charges and revenue generated by referrals and hospitalizations from primary care practices, such as the study by Glenn et al that estimated that each primary care referral generated a conservative average of at least $3,000 of revenue to the health system in 1987.[8] Regardless of the methodology, these studies have generally found that teaching hospitals generate $6–$15 of so-called indirect revenue (revenue not generated in the primary care clinic itself) for every $1 of direct primary care revenue. In one such study, $10.32 of hospital revenue and $4.71 of specialty physician revenue was generated for every $1 of revenue in the primary care system.[10] Only about 13.5%[7] to 17%[8] of total charges were for primary care, while approximately 60% of the charges were for hospital care.

In the present study, our hospital generated approximately $6 of indirect charges for every dollar of direct charges in primary care. When specialty physician charges are considered as well as hospital charges, our health system produced $7.23 of charges for every $1 of charges in primary care. This is consistent with the previous reports, even though we used somewhat different methodology and even though specialty referrals to non-university physicians and hospital charges in other hospitals were not analyzed. During the study period, at least 10% of the specialty referrals and hospital admissions from our primary care system were sent into the community and thus were not captured by either billing system. This may explain the lower downstream revenue generated for specialists. Other reasons for this difference may be differences in the scope of primary care practice, an aggressive managed care market, or differences in cost structure, compared with systems involved in previous studies.

Woodcock reported approximately $1–$2.2 million of hospital revenue per primary care physician per year.[10] Our primary care system included approximately 30 full-time-equivalent (FTE) primary care physicians during this period. Thus, these data suggest hospital indirect (multiplier effect) revenue of approximately $1.45 million per primary care physician FTE per year, well within this range. Finally, many health systems have expressed concern about the payer mix of patients in primary care, where a disproportionate number of Medicaid and uninsured patients are seen. In our system, there was in fact a lower collection rate for hospital charges from the primary care cohort, but the difference was small given the mission relevance of teaching and service in these clinics. Overall, these data

Table 1

Health System Charges for the Primary Care Cohort (56,459 Patients)
October 1, 1998–March 31, 1999

Hospital Charges in the Primary Care Clinics	*Faculty Practice Charges in the Primary Care Clinics*	*Hospital Charges in Non-primary Care Settings*	*Faculty Practice Group Charges in Non-primary Care Settings*	*Total Charges for Health System for the Primary Care Patient Cohort*
$3,496,502	$3,746,810	$43,559,741	$8,825,611	$59,628,663

compare favorably to those previously reported in other health systems.

Limitations

This study was done using a similar methodology to that described by Schneeweiss et al[7] and Woodcock.[10] This method is easier to use than measuring the charges from each referral and hospitalization. Our analysis, however, identified the primary care cohort using billing data rather than a practice registration system. Thus, our analysis could be replicated even in institutions that lack the information system to identify the primary care population prospectively. There are, however, several limitations inherent in using these methods. This method does not measure primary care referrals. Some of the hospital and emergency department charges could have been generated before an individual patient ever visited the primary care clinic. In fact, some of the patients in the primary care cohort could have been referred to the clinic for follow-up after hospitalization. Another specific limitation to this study was that it was done over a 6-month period of time during the fall and winter quarters. It is possible that the demonstrated effect may be different than an analysis that examines an entire year due to seasonal variations. This study also did not examine specialty physician or hospital charges outside of the university system. Thus, these data probably underestimate the total economic effect of the primary care practices on the health system as a whole.

Conclusions

This study demonstrates that patients from the primary care system account for 18.5% of total charges for hospital care and 17.6% of the specialty physician business. Further, the difference in collection rates for primary care and non-primary care patient populations was small. The method of analysis used in this study was simply and quickly done using existing billing data from a university hospital and a faculty practice group. The results of this study are compatible with other studies that have used more laborious methods.

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AN ARIZONA POLICY PRIMER

Graduate Medical Education in Arizona: Growing the Physician Pipeline

ARIZONA HEALTH FUTURES

MARCH 2012

ARIZONA HEALTH FUTURES Policy Primers: *a nonpartisan guide to a better understanding of key terms and issues in the Arizona health policy landscape.*

Graduate Medical Education in Arizona

Growing the Physician Pipeline

A Collaborative Project of St. Luke's Health Initiatives, Greater Valley Health Education Center and the Arizona Chamber Foundation

Ready access to health care affects the overall health status, quality of life and life expectancy of Arizonans. Improving access to care could help our state detect and treat health conditions earlier, prevent disease and disability and diminish the number of preventable deaths among Arizonans. It could also help drive efficiencies in care delivery, allowing the state to more effectively contain costs over the long term.

An adequate number of healthcare workers plays an important role in ensuring that Arizonans have ready access to care. However, Arizona has far fewer physicians and residents per capita than the national average. Beginning in 2014, demand for these physicians is likely to increase due to the expansion of health coverage contained in the federal health reform law known as the Patient Protection and Affordable Care Act. Additionally, the demand for healthcare services is expected to increase due to the aging of the national population and the continued growth of the obesity epidemic. In particular, there will be greater demand for primary care doctors as the healthcare system puts increased emphasis on delivering care in the most cost-effective setting before conditions become acute.

St. Luke's Health Initiatives
A Catalyst for Community Health

GVAHEC
Greater Valley Area Health Education Center

ARIZONA CHAMBER
Foundation

Graduate medical education (GME), more commonly known as a residency, plays an important role in training and retaining physicians in our state. Unfortunately, Arizona ended its financial support for graduate medical education in 2010 – an important component for training and retaining physicians in this state – as a result of the economic downturn and recent budget cuts. While other funding streams still exist, current workforce shortages and the prospect of increased future demand for services suggest the need to explore new models for funding, sustaining and growing residency programs in Arizona. This policy primer explores some of those options, examining publicly and privately financed models used in other states, as well as new opportunities that exist as a result of changes in federal law. We even share some "out-of-the-box" ideas.

At a time when our state is short on jobs and revenue, support for residencies may be a means to achieving economic growth.

Growing our healthcare workforce is not only a strategy for ensuring access to care. It is also an economic development tool. A study by the American Medical Association found that practicing office physicians in Arizona contribute nearly $18 billion in economic output and support over 70,000 jobs throughout the Arizona economy.[1] And there are additional economic benefits to strengthening our healthcare workforce. A high-quality healthcare system may attract businesses and individuals to the state. Augmenting the number of residency programs in Arizona may also be a quality improvement tool, allowing expert faculty to be involved in patient care.

Let's begin by exploring the role that graduate medical education plays in the creation of our healthcare workforce.

Role of Graduate Medical Education in Building a Healthcare Workforce

The quality of the U.S. healthcare system is highly dependent on the skills and talent of the healthcare workforce. Physicians make up a core component of the overall healthcare workforce. Ensuring an adequate supply of skilled medical labor requires a robust and dynamic medical education system. For aspiring physicians, this training consists of two steps. The first step is completion of medical school, and the second step is completion of a medical residency.[2] Together, these two training programs equip doctors with the skills needed to practice medicine in the United States. For the purpose of this brief, the terms graduate medical education, GME and residency will be used interchangeably.

Medical School

The first step in becoming a physician is completion of a four-year, postgraduate educational program at an accredited allopathic or osteopathic medical school. While attending medical school, students develop a knowledge base that prepares them for graduate training in one of the many medical specialties. All graduates earn one of two degrees: a Doctor of Medicine (MD) for graduates of allopathic medical schools or a Doctor of Osteopathy (DO) for graduates of osteopathic medical schools.

Graduate Medical Education

After graduating from medical school, physicians complete a GME program, or residency, in a medical specialty or subspecialty. The Accreditation Council for Graduate Medical Education (ACGME) recognizes 26 different specialties and over 100 subspecialties. During these residencies, which typically occur in a hospital setting, physicians acquire the knowledge and develop the skills required to practice independently.

Funding Graduate Medical Education

Graduate medical education programs are supported with a combination of private and public funding.

Medicare

Medicare is the largest source of public funding for graduate medical education, contributing $9.5 billion in 2009. Three billion dollars of these payments were categorized as Direct Graduate Medical Education and $6.5 billion were categorized as Indirect Graduate Medical Education. The Medicare Payment Advisory Commission, the independent Congressional agency that advises Congress on issues affecting the Medicare program, distinguishes between Direct and Indirect payments in the following way:[3]

- **Direct** payments are "intended to support the teaching aspects of residency programs, such as resident stipends and benefits, supervisory physician salaries, and administrative overhead expenses."
- **Indirect** payments are "designed to support the higher costs of patient care associated with teaching, such as residents' 'learning by doing,' greater use of emerging technologies, and patient severity."

While Medicare remains the largest public financial supporter of GME, since 1997 there has been a limit on the number of residency slots for which teaching hospitals can receive Medicare funding. For hospitals that had existing residency programs in place when the Balanced Budget Act was passed in 1997, Medicare continues to provide funding for those slots that existed in 1996. However, Medicare does not fund any new positions at those hospitals. For hospitals that did not have residency programs when the Balanced Budget Act was passed, Medicare will provide funding. However, three years after the establishment of the program, a cap goes into effect at these hospitals as well. The cap is set at the number of slots that exist in the third year, and any additional growth of the program is not eligible for Medicare funding.[4]

Medicaid

Medicaid is the second largest source of public funding for graduate medical education, accounting for $3.8 billion in 2009. Each state decides whether to fund GME through its Medicaid program. In 2009, forty-one state governments chose to participate. This is down from 48 states in 2005. Arizona is among the minority of states that no longer provides state general fund support for GME.[5]

Arizona is among the minority of states that no longer provides state general fund support through Medicaid for GME.[5]

Medicaid is funded jointly between the federal government and the states. The degree to which the federal government contributes toward the cost of each state's Medicaid expenses depends on each state's Federal Medical Assistance Percentage, or FMAP. This number, which varies by state between 50 percent and 85 percent, is determined annually by the U.S. Department of Health and Human Services. In Arizona the FMAP is 65.85 percent, meaning that the federal government pays for 65.85 percent of Arizona's Medicaid expenses and the state pays for the remaining 34.15 percent. This means that a one dollar investment in GME yields approximately two dollars in federal matching funds. Likewise, a one dollar reduction in state Medicaid spending results in a loss of two additional federal dollars. In 2009, the last year Arizona contributed towards GME, the state contribution of $15.3 million triggered $29.6 million in federal funding.

Department of Veterans Affairs and Department of Defense

While the amount of funding is unknown, the U.S. Department of Veterans Affairs directly supports 9,000 residents and also allows 30,000 residents from other GME programs to complete rotations at Veterans Affairs facilities nationwide. In addition, the Department of Defense supports another 3,000 residents nationally.[6]

Health Resources and Services Administration

The Health Resources and Services Administration is the operating division within the U.S. Department of Health and Human Services that administers programs aimed at improving access to healthcare services for people who are uninsured, isolated or medically vulnerable. Created by Congress in 1999, the Children's Hospital Graduate Medical Education Payment Program provides federal funding to 56 freestanding children's hospitals. In 2009, the $300 million program supported 5,631 residents, but the future of this program is uncertain.[7] President Obama's FY 2012 budget proposal called for the elimination of Children's Hospital GME funding. While Congress did appropriate $268 million to the program for FY 2012, legislation that would reauthorize the program through 2016 is still pending.[8]

Private Funding

While teaching hospitals are recipients of the public funding described above, many also invest their own money into residency programs. It is estimated that teaching hospitals have fully funded the establishment of 8,000 new residency positions since Medicare capped the number of positions that would be eligible to receive funding.[9] While the cost of training a resident varies considerably based on specialty and location, in most cases it is a substantial investment on the part of hospitals to create residencies that exceed their Medicare cap.

Healthcare System Changes and Workforce Implications

Arizona, like the nation as a whole, has a shortage of physicians.

Arizona, like the nation as a whole, has a shortage of physicians. Before discussing graduate medical education in Arizona in greater detail, it is helpful to understand a number of the trends and transformations that are occurring in the healthcare sector at a national level. Changes to the physician supply, the required specialty mix, healthcare delivery models and the role of government funding are four factors that help provide context for the discussion of GME in Arizona.

Physician Shortage

In 2008, the Association of American Medical Colleges (AAMC) released a study that identified a looming crisis for the U.S. healthcare sector. The study projected that there will be a national shortage of 124,000 physicians by 2025, driven in large part by a growing and aging national population. In addition, the demand is on the rise for treatment of conditions related to the obesity epidemic. A June 2010 update to the study indicated that the passage of federal healthcare reform will further increase the demand for physician services by expanding insurance coverage to approximately 30 million previously uninsured individuals. This newly insured population is likely to initially utilize physician services at a higher rate than average due to the fact that ailments went untreated for numerous years. As a result, the shortage grows to 130,600 physicians.[10] Table 1 shows how the physician shortage will grow over time.

TABLE 1: Projected National Physician Shortage: 2010-2025

YEAR	SUPPLY	DEMAND	SHORTAGE
2010	709,700	723,400	13,700
2015	735,600	798,500	62,900
2020	759,800	851,300	91,500
2025	785,400	916,000	130,600

Source: AAMC. *The Complexities of Physician Supply & Demand: Projections through 2025*. November 2008. Updated June 2010.

The Association of American Medical Colleges uses four measures of physician supply.

- **ACTIVE PHYSICIANS:** This includes physicians who work in administration, direct patient care, medical research, medical teaching and other roles.
- **ACTIVE PATIENT CARE PHYSICIANS:** Subset of active physicians. This includes only those physicians who engage primarily in direct patient care.
- **ACTIVE PRIMARY CARE PHYSICIANS:** Subset of active physicians. This includes the specialties of adolescent medicine, family medicine, general practice, geriatric medicine, internal medicine and pediatrics.
- **ACTIVE PATIENT CARE PRIMARY CARE PHYSICIANS:** Subset of both active patient care physicians and active primary care physicians. This includes only those primary care physicians who engage primarily in direct patient care.

A common metric that is used to compare the physician supply in different geographic regions is *physicians per 100,000 of population.* As Table 2 indicates, Arizona's concentration of physicians falls well below the national concentration under all four measures of supply.

TABLE 2: 2010 Physician Supply, by AAMC Physician Category, U.S. and Arizona

	U.S.		ARIZONA		STATE MEDIAN	ARIZONA RANK
	Number	Rate per 100,000	Number	Rate per 100,000	Rate per 100,000	Out of 50 States
Active Physicians	799,509	258.7	14,694	220.1	244.2	33
Active Patient Care Physicians	678,324	219.5	12,904	193.3	215.1	36
Active Primary Care Physicians	279,719	90.5	5,151	77.1	91	41
Active Patient Care Primary Care Physicians	245,367	79.4	4,544	68.1	80.4	43

Source: AAMC. *2011 State Physician Workforce Data Book*. November 2011. Assumes U.S. population 309,050,816 and Arizona population 6,676,627.

Table 3 shows the number of additional physicians in each category that Arizona needs to meet national concentration rates:

TABLE 3: Number of Arizona Physicians Needed to Meet U.S. Rate per 100,000

	CURRENT SUPPLY	CURRENT RATE	TARGET SUPPLY	TARGET RATE	PHYSICIANS NEEDED
Active Physicians	14,694	220.1	17,272	258.7	2,578
Active Patient Care Physicians	12,904	193.3	14,655	219.5	1,751
Active Primary Care Physicians	5,151	77.1	6,042	90.5	891
Active Patient Care Primary Care Physicians	4,544	68.1	5,301	79.4	757

Source: Calculations based on data from: AAMC. *2011 State Physician Workforce Data Book*. November 2011. Assumes U.S. population 309,050,816 and AZ population 6,676,627.

Specialization

A quality healthcare system requires a diverse group of physicians practicing in a wide range of specialties. One factor for policy makers to consider when evaluating graduate medical education is the balance between the number of physicians practicing in primary care and those in more targeted specialties. The Accreditation Council for Graduate Medical Education recognizes 26 core specialties and, within each specialty, there are a number of subspecialties that require additional training. Increasingly, physicians are electing to complete a subspecialty as part of their training. In 2001, subspecialties accounted for 49 percent of the total number of residency programs and 13 percent of the total number of residents. Today, those percentages have risen to 55 percent and 17 percent respectively.[11]

The compensation of primary care physicians is well below that of other specialties and has been shown to reduce the odds that physicians pursue careers in primary care or family medicine by nearly half.[12]

Financial considerations are a key reason for this shift. The compensation of primary care physicians is well below that of other specialties and has been shown to reduce the odds that physicians pursue careers in primary care or family medicine by nearly half.[12] In particular, Medicare and Medicaid compensation policies pay higher rates for specialized services, which create an incentive for physicians to enter sub-specialty fields. While researchers have yet to find a definitive link between student debt and specialty choice, members of Arizona's GME community with whom we spoke consistently expressed concern over the impact of rising levels of medical student debt. Of the 85 percent of U.S. medical school graduates who graduated with outstanding loans in 2010, the average debt burden was $158,000.[13]

Changing Delivery Models

Changes to the way that healthcare services are delivered are likely to change the way that healthcare training is conducted. Growth in the cost of health care is forcing healthcare providers to rethink the way in which health care is delivered. New delivery models such as Accountable Care Organizations and medical homes emphasize coordinated care among teams of providers that include primary care physicians, specialists, behavioral health providers, and mid-level providers such as physician's assistants and nurse practitioners. Technology will be used to facilitate communication between members of these teams. The transition to this type of model will accelerate as public and private health insurance reimbursement policies shift towards paying for outcomes and cost effective management of chronic disease and away from the current practice of paying for procedures.

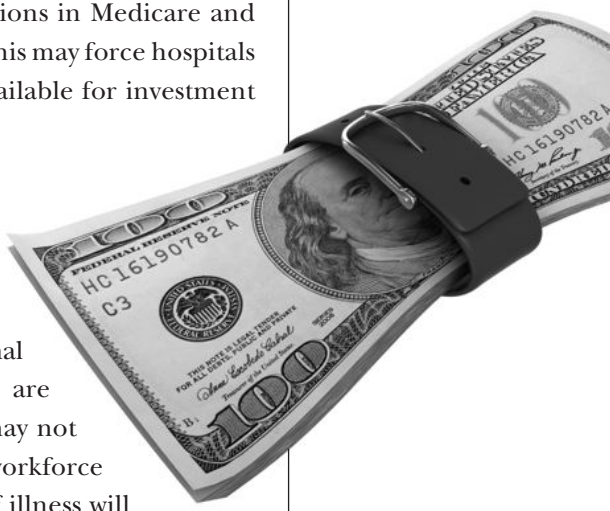
Both Accountable Care Organizations and medical homes require a different mix of medical professionals than the current system, and the education and training policies will

have to adapt. In particular, a greater emphasis on prevention and wellness will increase the demand for physicians in primary care specialties.

Declining Government Funding Levels

Government funding for graduate medical education is coming under increased scrutiny in light of the fiscal challenges facing both the federal and state level. Beginning in 1997, Medicare capped the number of residency slots that are eligible to receive funding at hospitals with existing programs. Recently, President Obama's deficit reduction commission recommended an additional reduction in Medicare payments for indirect medical education. At the state level, Arizona stopped funding GME in FY 2010. Government funding reductions for GME at a time when there is a need to train more physicians creates challenges for the system and forces stakeholders to find creative ways to meet the training needs of the U.S. healthcare system.

Despite the Medicare cap, and the more recent elimination of state funding, the total number of residents and residency programs in Arizona continued to increase between 2000 and 2010. This implies that Arizona hospitals invested their own resources into residency programs even after they reached their Medicare cap. Nationally, it is estimated that teaching hospitals funded the establishment of 8,000 new residency positions since the Medicare cap went into place.[14] However, relying exclusively on hospitals to pay for the required expansion of residency slots is unrealistic for a number of reasons. First, reductions in Medicare and Medicaid reimbursement rates are reducing hospital revenues. While this may force hospitals to improve efficiency, it also reduces the amount of capital that is available for investment in residency programs.



Second, hospitals are motivated to establish residency programs, in part, by the hope that the physicians will stay and practice at the hospital after completion of the program. As a result, teaching hospitals are likely to establish new residency programs in those specialties of greatest need to the hospital. Such a decision is perfectly rational from the perspective of the hospital, especially when public funds are not supporting the program. However, these decisions by hospitals may not yield the optimal mix of specialties from a broader state or national workforce perspective. Greater emphasis on the prevention and management of illness will increase the demand for physicians in less hospital-centric specialties, but there is little incentive for hospitals to invest their own capital into these types of programs.

In addition to government funding *levels*, there are challenges related to the distribution of those funds. For example, some hospitals are still under their Medicare cap and are therefore eligible for federal funding when they establish a new residency program. However, there is often a lag in the receipt of first-year direct GME payments because direct GME payments are determined using a per-resident amount from the previous year's cost report.[15] The hospitals are still entitled to the direct payments during the first year, but in many cases they need to support the program with their own funding until the payments are subsequently recovered. While there is no lag associated with indirect GME payments, the unrecoverable start-up costs and the initial delay in receipt of direct GME payments may prohibit the hospital from establishing the residency, even with the availability of future federal funding. Further, these new programs are capped after their third year which means that hospitals must ramp up the programs quickly in order to maximize their future funding.

Physician Training in Arizona

Physician training in Arizona includes both medical schools and residency programs.

Medical Schools

Between 2000 and 2010, Arizona was the second fastest growing state in the number of medical students, expanding 117 percent.

Two major types of medical schools exist: allopathic schools which train physicians for the credential of Medical Doctor (M.D.) and osteopathic schools which train physicians for the credential of Doctor of Osteopathy (D.O.). Between 2000 and 2010, Arizona was the second fastest growing state in the number of medical students, expanding by 117 percent. The number of allopathic medical students studying at the University of Arizona College of Medicine campus in Tucson and the new Phoenix campus grew from 427 to 650, while the number of osteopathic students grew from 482 to 1,322. The 174 percent expansion in osteopathic students is attributable to the growth of Midwestern University/Arizona College of Osteopathic Medicine and the establishment of the A.T. Still School of Osteopathic Medicine in Arizona. In September of 2011, the Mayo Clinic Medical School announced plans to add a new medical school campus at the Mayo Clinic in Scottsdale. In collaboration with Arizona State University, the new Mayo Medical School-Arizona Campus will enable students to earn both a medical degree from Mayo Medical School and a specialized master's degree in the Science of Health Care Delivery from ASU. Annual enrollment is projected at 48 students, and the first class could begin as early as September 2014.[16]

In 2012, the Creighton University School of Medicine in Omaha will open a new campus at St. Joseph's Hospital and Medical Center in Phoenix. Under this unique arrangement, 42 Creighton University medical students will move to Phoenix annually to complete their third and fourth years at the St. Joseph's campus after completing the first two years in Omaha.[17]

TABLE 4: 2010 Medical School Student Supply, U.S. and Arizona

	U.S.		ARIZONA		ARIZONA RANK
	Number	Rate per 100,000	Number	Rate per 100,000	Out of 50 States
Total	**97,188**	**31.4**	**1,972**	**29.5**	**20**
Allopathic	77,761	25.2	650	9.7	45
Osteopathic	19,427	6.3	1,322	19.8	4

Source: Calculations based on data from: AAMC. *2011 State Physician Workforce Data Book*. November 2011. Assumes U.S. population 309,050,816 and Arizona population 6,676,627.

Graduate Medical Education

Both the Accreditation Council for Graduate Medical Education (ACGME) and the Association of American Medical Colleges (AAMC) track the supply of residents in the United States, and they each published new 2011 data in August and November respectively. Due to some minor differences in methodology and timing, their numbers are slightly different. For example, ACGME reports that the number of residents in Arizona is 1,430 and AAMC reports the number is 1,452. When applicable, we will present the statistics as measured by both organizations, but in some cases only one organization measures a certain aspect of the supply.

There are two residency accreditation bodies in the United States: the Accreditation Council for Graduate Medical Education and the American Osteopathic Association (AOA).

As shown in Tables 5 and 6, there are currently 117 ACGME accredited residency programs and seven AOA accredited residency programs in Arizona. It is worth noting that osteopathic medical students are able to enroll in many of the programs in Table 5, but allopathic medical students cannot enroll in the programs in Table 6. Combined, these programs have an approved capacity of 1,803 and are sponsored by the following entities:[18]

TABLE 5: ACGME Accredited Residency Program Sponsors in Arizona

HOSPITAL	SPONSORED RESIDENCY PROGRAMS
Banner Good Samaritan Medical Center	15
Maricopa Medical Center	8
Mayo Clinic	23
Phoenix Baptist Hospital and Medical Center	1
Phoenix Children's Hospital	7
Scottsdale Healthcare-Osborn	1
St. Joseph's Hospital and Medical Center	12
Tucson Hospitals Medical Education Program	1
University of Arizona College of Medicine	42
University of Arizona/UPHK GME Consortium	7
TOTAL	**117**

Source: ACGME List of Programs by Sponsor. Accessed at www.acgme.org/adspublic/.

TABLE 6: AOA Accredited Residency Program Sponsors in Arizona

HOSPITAL	SPONSORED RESIDENCY PROGRAMS
Verde Valley Medical Center	1
Kingman Regional Medical Center	2
Alta Dermatology	1
Advanced Desert Dermatology	1
Sierra Vista Regional Health Center	2
TOTAL	**7**

Source: American Osteopathic Association. Accessed at http://opportunities.osteopathic.org/search/search.cfm.

There are currently 117 ACGME accredited residency programs and seven AOA accredited residency programs in Arizona.

The Association of American Medical Colleges tracks the number of residents in ACGME accredited programs by degree type. Table 7 excludes 5,805 residencies that are approved by the American Osteopathic Association because the osteopathic data includes fewer details and limits the ability to conduct additional analysis.[19]

TABLE 7: 2010 Resident Supply, U.S. and Arizona (AAMC)

	U.S.		ARIZONA		ARIZONA RANK
	Number	Rate per 100,000	Number	Rate per 100,000	Out of 50 States
Total Residents	**110,692**	**35.8**	**1,452**	**21.7**	**37**
MDs	102,518	33.2	1,274	19.1	38
DOs	8,172	2.6	178	2.7	18

Source: Calculations based on data from: AAMC. *2011 State Physician Workforce Data Book*. November 2011. Assumes U.S. population 309,050,816 and Arizona population 6,676,627.

As shown in Table 8, the actual numbers from the Accreditation Council for Graduate Medical Education are slightly different. However, the numbers in both cases lead to the same conclusion: the concentration of residents in Arizona is well below the national concentration.

TABLE 8: 2010 Resident Supply, U.S. and Arizona (ACGME)

	U.S.		ARIZONA		ARIZONA RANK
	Number	Rate per 100,000	Number	Rate per 100,000	Out of 50 States
Total Residents	**113,142**	**36.2**	**1,430**	**22.4**	**38**
MDs	104,710	33.5	1,255	19.6	40
DOs	8,432	2.7	175	2.7	19

Source: Calculations based on data from: ACGME. *Data Resource Book 2010-2011*. August 2011. Assumes U.S. population 312,471,327 and Arizona population 6,392,017.

The Association of American Medical Colleges also measures the number of residents in primary care specialties.

TABLE 9: 2010 Primary Care Resident Supply, U.S. and Arizona (AAMC)

	U.S.		ARIZONA		ARIZONA RANK
	Number	Rate per 100,000	Number	Rate per 100,000	Out of 50 States
Total Primary Care Residents	**41,339**	**13.4**	**593**	**8.9**	**35**
MDs	37,395	12.1	494	7.4	38
DOs	3,943	1.3	99	1.5	13

Source: Calculations based on data from: AAMC. *2011 State Physician Workforce Data Book*. November 2011. Assumes U.S. population 309,050,816 and Arizona population 6,676,627.

In addition, AAMC reports the growth in number of residents between 2000 and 2010. During this time, Arizona was the fourth fastest growing state, growing by 37.7 percent (398 additional residents). Nationally, the number of residents grew by 15.3 percent.

Both Schools and Residencies Needed

To meet the growing demand for physicians' services in the U.S., the Association of American Medical Colleges recommended in 2006 that, by 2015, U.S. medical schools increase enrollment by 30 percent over 2002 levels. As of 2010, enrollment had increased by 13.2 percent and is projected to reach 27.6 percent by 2015. This growth is the result of expansions at existing medical schools and the establishment of new medical schools since 2002. During the same time periods osteopathic medical school enrollment grew by 70 percent and is projected to reach 102 percent growth by 2015.

Taxpayers are making a significant investment in this expansion. Nationwide, 59 percent of the 3,963 additional medical students will be enrolled at public medical schools in 2015.[20] In Arizona, enrollment at the University of Arizona's College of Medicine grew by 52 percent between 2000 and 2010, from 427 students to 650 students. A significant portion of this growth was a result of the University of Arizona College of Medicine expansion of its Phoenix campus, which enrolled its first full, four-year class of medical students in August 2007. In addition, Midwestern University/Arizona College of Osteopathic Medicine and A.T. Still School of Osteopathic Medicine in Arizona have made significant investments in Arizona that have resulted in rapid growth in the number of osteopathic medical students. Expansion plans at both schools and the recent announcement by Mayo Clinic Medical School suggest that growth in Arizona's medical student population will continue.

The expansion of medical school capacity is a positive development for Arizona. The investment of public funds is justified when those students choose to practice in Arizona. Of the 3,583 active physicians nationwide who graduated from Arizona medical schools, 43.8 percent are currently practicing in Arizona. This ranks as the 18th best retention rate in the country and well above the national rate of 38.6 percent.

The justification for using tax revenues to fund medical education in Arizona is that a larger supply of doctors in the state will improve the general welfare of Arizona citizens. As Table 10 indicates, 75 percent of Arizona graduates who complete a residency in Arizona stay in the state to practice, while only 28 percent of Arizona graduates who complete a residency in another state return to practice. These statistics indicate that there is an opportunity to capture more of the benefits that Arizona's medical schools are generating by expanding residency opportunities in Arizona.

TABLE 10: Practicing Graduates of Arizona Medical Schools, by Current Location and Residency Location

	TOTAL	RESIDENCY IN ARIZONA	RESIDENCY OUTSIDE OF ARIZONA
Practicing Arizona Medical School Graduates	3,583	1,222	2,361
Number Currently Practicing in Arizona	1,571	916	655
Percentage Currently Practicing in Arizona	44%	75%	28%

Source: Calculations based on data from: AAMC. *2011 State Physician Workforce Data Book*. November 2011.

From a public policy perspective, these numbers indicate that simply increasing medical school enrollment is insufficient. To maximize the impact of those additional medical students, there should be a corresponding expansion of graduate medical education. Only 34 percent of Arizona medical school graduates completed their residency in Arizona, which ranks 23rd among the 45 states with medical schools and below the national rate of 39 percent. Increasing the percentage of graduates who stay in Arizona to train will generate a higher return on the public investment in the form of economic benefits and greater access to care for Arizona residents.

Increasing the percentage of graduates who stay in Arizona to train will generate a higher return on the public investment in the form of economic benefits and greater access to care for Arizona residents.

The Need

Next, we use the two sources of data from above to determine the number of additional residency slots that Arizona needs to meet the national levels. As Table 11 shows, Arizona needs to add 848-885 residency slots, and around 300 of the needed slots should be in primary care in order to achieve the national rate of primary care residents.

TABLE 11: Number of Arizona Residencies Needed to Meet U.S. Rate per 100,000

	CURRENT SUPPLY	CURRENT RATE	TARGET RATE	TARGET SUPPLY	RESIDENCY POSITIONS NEEDED
AAMC	1,452	21.7	35.8	2,390	848
ACGME	1,430	22.4	36.2	2,315	885
Primary Care (AAMC)	593	8.9	13.4	895	302

Source: Calculations based on data and assumptions from Table 7, 8, and 9.

It is important to keep in mind that this level of expansion in Arizona will put the state on par with the national rates of physician training. That does not suggest that the national

rate of physician training is generating a sufficient supply of physicians. In fact, numerous reports suggest that the nation is already experiencing a shortage. However, it is a useful starting point for assessing Arizona's options. While the number of total residency positions will be a key focus of our analysis and is an important metric for evaluating the graduate medical education system both nationally and in Arizona, it is important to understand the limitations of the data. First, consider a three-year family medicine residency and a seven-year neurosurgery residency. If each program admits two new residents per year, both programs produce two new physicians annually. However, in terms of measuring the number of residents, the family medicine residency counts for six residents (two per year for three years) and the neurosurgery residency counts for 14 residents (two per year for seven years). Therefore, the number of residency slots does not fully capture the impact that those residencies have on physician supply. For lawmakers who are attempting to design policies aimed at increasing physician supply, it is important to consider the type of residency and, in particular, the number of first year residents entering the program each year.

GME funds became subject to an annual legislative appropriation in FY 1999. Since 2010, state funding has been eliminated and, as a result, the federal funding as well.

Additionally, the rate at which current physicians are retiring impacts the rate at which the training programs need to produce new physicians. Nationally, over one-third of the physician population is age 55 or older.[21] If current physicians start to retire earlier, an increase in training capacity will be required in order to maintain the current ratio of physicians per 100,000 of population. This implies that capacity will be required to expand by even more if the shortage is to be addressed. On the other hand, if current physicians continue working longer, increases in training capacity will be able to impact the shortage more directly.

Baseline

Arizona began contributing to graduate medical education in 1993. Initially, the money was embedded in each Medicaid capitation payment made to teaching hospitals. In 1997 the legislature established a separate program that would pay hospitals one annual payment for GME. Under this new program that went into effect in FY 1999, GME funds became subject to an annual legislative appropriation. As Table 12 indicates, the legislature chose to fund GME every year until 2010. Since then, the state funding has been eliminated and, as a result, the federal funding as well.

TABLE 12: Medicaid Funding for GME in Arizona, 1999-2012

	STATE	FEDERAL	TOTAL
1999	$9,243,900	$ 9,045,900	$ 18,289,800
2000	$9,247,300	$ 9,042,500	$ 18,289,800
2001	$7,766,700	$ 10,523,100	$ 18,289,800
2002	$6,508,500	$ 15,174,700	$ 21,683,200
2003	$6,490,400	$ 16,037,700	$ 22,528,100
2004	$6,706,200	$ 13,770,700	$ 20,476,900
2005	$6,883,500	$ 14,264,000	$ 21,147,500
2006	$7,179,300	$ 14,640,700	$ 21,820,000
2007	$11,519,800	$ 26,993,000	$ 38,512,800
2008	$14,894,000	$ 29,262,600	$ 44,156,600
2009	$15,323,100	$ 29,583,100	$ 44,906,200
2010	$0	$0	$0
2011	$0	$0	$0
2012	$0	$0	$0

Source: Arizona Joint Legislative Budget Committee. *Appropriation Reports, FY 2000-FY 2012*.

Some public hospitals have still been able to access federal Medicaid funds through the intergovernmental transfer mechanism.

While the general fund support for GME has been eliminated, some public hospitals have still been able to access federal Medicaid funds through the intergovernmental transfer mechanism. This mechanism allows local governments and public universities to provide funding that is then used by Medicaid to draw down matching funds from the federal government. The FY 2012 state budget anticipates that local governments and universities will contribute $38 million that will be used to draw down $73 million in federal funds. However, these funds will only be used to fund programs at public and university affiliated teaching hospitals. Given the continued stress on local government and university budgets, it is unclear whether the anticipated levels can be met and sustained.[22]

As Table 13 shows, the per-resident support for GME rose between 2000 and 2009.[23] For the purposes of evaluating potential funding alternatives, it will be assumed that the goal is to return to 2009 per-resident funding levels. That per-resident amount will then be used to determine the size of investment that is required to expand by 848-885 residents and reach the national rate.

TABLE 13: Per-Resident Medicaid Funding in Arizona, 2000 and 2009

	NUMBER OF RESIDENTS	STATE FUNDING PER RESIDENT	FEDERAL FUNDING PER RESIDENT	TOTAL FUNDING PER RESIDENT
2000	1,038	$8,909	$8,711	$17,603
2009	1,296	$11,823	$22,826	$34,650

Source: Calculation based on expenditure data in Table 12, 2000 resident count from Arizona Primary Care Residency Training Assessment and Development Project, and 2009 resident count from the *ACGME Data Resource Book 2008-2009*. Excludes Osteopathic residents.

Calculation

To determine the amount of money that is needed to A) restore support for current residencies and B) expand by 848-885 residencies to meet the national rate of physicians, we made the following calculations and assumptions.

- We assumed that the distribution of Medicare and Medicaid funding for GME in Arizona was two-thirds Medicare and one-third Medicaid. The following chart shows actual Medicare GME payments to Arizona hospitals from 2000-2007 and estimated payments for 2008 and 2009.[24] The 2008 and 2009 estimates assume 5.7 percent annual growth in the size of Medicare payments, which was the average from 2000-2007. As the table shows, the Medicaid contribution was between 21 percent and 25 percent from 2000 and 2006, but jumped to 32 percent in 2007. This is a result of 2007 legislation that increases Arizona's level of financial participation in GME. That funding level continues in 2008 and 2009, yielding the one-third proportion.

TABLE 14: Medicare and Medicaid Payments to GME in Arizona, 2000-2009

	MEDICARE PAYMENTS	MEDICAID	TOTAL	% MEDICARE	% MEDICAID
2000	$55,916,077	$18,289,800	$74,205,877	75.35%	25%
2001	$61,075,177	$18,289,800	$79,364,977	76.95%	23%
2002	$66,708,162	$21,683,200	$88,391,362	75.47%	25%
2003	$66,758,645	$22,528,100	$89,286,745	74.77%	25%
2004	$76,360,514	$20,476,900	$96,837,414	78.85%	21%
2005	$79,233,704	$21,147,500	$100,381,204	78.93%	21%
2006	$79,701,193	$21,820,000	$101,521,193	78.51%	21%
2007	$81,554,415	$38,512,800	$120,067,215	67.92%	32%
2008	$86,166,442*	$44,156,600	$130,323,042	66.12%	34%
2009	$91,039,285*	$44,906,200	$135,945,485	66.97%	33%

Source: Medicare payment data from Robert Graham Center, Medicaid data from Table 12. * Estimate.

- We used the 2009 per-resident Medicaid support levels as the baseline for determining the cost of restoring funding for residencies that currently exist and for calculating the level of Medicare support. The 2009 resident count was 1,296.

TABLE 15: 2009 Per-Resident GME Support Level for 1,296 Arizona Residents

FUNDING	MEDICAID (STATE)	MEDICAID (FEDERAL MATCH)	MEDICARE	TOTAL
Total	$15,323,100	$29,583,100	$91,039,285	$135,945,485
Per Resident	$11,823	$22,826	$70,246	$104,896

Source: Calculations based on data from Table 13 and 14.

- Since 2009, the resident population has grown to between 1,430 and 1,452. Using the per-resident Medicaid support levels from 2009, the state cost of restoring funding for GME is between $16.9 million and $17.2 million.

TABLE 16: Funding for Current Arizona Resident Population, 2009 Per-Resident Support Level

	FUNDING	MEDICAID (STATE)	MEDICAID (FEDERAL MATCH)	MEDICARE	TOTAL
1,430 Residents (ACGME)	Total	$16,906,890	$32,641,180	$100,451,780	$149,999,850
	Per Resident	$11,823	$22,826	$70,246	$104,895
1,452 Residents (AAMC)	Total	$17,166,996	$33,143,352	$101,997,192	$152,307,540
	Per Resident	$11,823	$22,826	$70,246	$104,895

Source: Calculations based on data from Table 11, and Table 15.

- Expanding by 848-885 residents requires an additional $89 million to $93 million in total funding. Since 1997, there have been federal caps on the number of residency slots that are eligible for Medicare funding. While Medicare does provide funding for a limited number of residency slots at new teaching hospitals, we assume for the purpose of this analysis that the Medicare contribution to the expansion is zero. Using the 2009 per-resident support level, Arizona would spend an additional $10 million, which would trigger an additional $19 million to $20 million in federal matching funds. Table 17 shows the amount of money generated by this level of contribution, and the shortfall that results from the elimination of Medicare funding.

TABLE 17: Arizona Resident Expansion. 2009 Per-Resident Support Level, No Medicare Funds

	FUNDING	MEDICAID (STATE)	MEDICAID (FEDERAL MATCH)	TOTAL	TOTAL NEEDED	SHORTFALL
885 Residents (ACGME)	Total	$10,463,355	$20,201,010	$30,664,365	$92,832,075	$62,167,710
	Per Resident	$11,823	$22,826	$34,649	$104,895	$70,246
848 Residents (AAMC)	Total	$10,025,904	$19,356,448	$29,382,352	$88,950,960	$59,568,608
	Per Resident	$11,823	$22,826	$34,649	$104,895	$70,246

Source: Calculations based on data from Table 11 and Table 15.

To summarize, the funding need can be divided into three categories: Medicaid support for current residents, Medicaid support for expansion residents and Medicare elimination shortfall.

TABLE 18: Summary: Arizona Residency Funding Needs

	STATE	FEDERAL	TOTAL
Current Medicaid	$16.9M-$17.1M	$32.6M-$33.1M	$49.5M-$50.2M
Expansion Medicaid	$10M-$10.5M	$19.4M-$20.2M	$29.4M-$30.7M
Medicare Elimination	N/A	$59.6M-$62.1M	$59.6M-$62.1M
TOTAL			**$138.5M-$143M**

In total, there is a need to generate around $140 million. This number will be used as a reference point for evaluating the funding options that are presented below.

In total, there is a need to generate around $140 million.

Considering Potential Funding Sources

Now that an estimate for Arizona's residency funding need has been developed, the remainder of the paper will present potential funding sources that could be used to meet this $140 million need.

Evaluation Framework

In assessing potential funding sources, we analyze each according to three primary criteria:

- **SUFFICIENCY.** Could the source provide enough money to meet the need? As indicated in the analysis, approximately $50 million is needed to return to where the state was prior to the elimination of the general fund appropriation for graduate medical education. One hundred forty million is needed to more fully address the physician shortage. In evaluating each option, we look at how much money it is likely to generate relative to the need.
- **STABILITY.** Would the source provide a funding stream that is relatively consistent from year to year? One of the themes that the research team heard repeatedly was that hospitals need predictable funding levels in order to justify the enormous time and private financial resources that are necessary to start up and sustain a residency program. Public funding that is not "dedicated" to GME could be reallocated or "swept" by the legislature. Similarly, private grants or investments that are not guaranteed over a period of several years could also be deemed as too risky. Measures that are passed by a ballot proposition are "voter-protected" as a result of Proposition 105. This means that the legislature cannot alter the ballot proposition except to further the cause and by a two-thirds vote of both the House and the Senate. Therefore, funding streams that are enacted by way of ballot proposition would be more stable than those passed by the state legislature.

Most of the funding source options would require either legislative action or a vote of the people of Arizona.

- **POLITICAL VIABILITY.** Does the funding source stand a chance in today's political environment? There are several facts that come into play in assessing political viability:
  - Any increase in revenue by the state legislature requires a two-thirds vote of both the House and the Senate as a result of Proposition 108.
  - Eighteen members of the legislature have signed "no new tax" pledges. Three of the thirty members of the Arizona Senate (10 percent) and 15 of 60 members of the Arizona House of Representatives (25 percent) have signed the pledge. With the upcoming election in November 2012, these numbers are likely to change.
  - Taking a measure to the ballot requires either a referral of the legislature or a citizens' initiative. In the case of a citizen's initiative, signatures must be collected from 10 percent of the electorate (153,365) or 15 percent of the electorate (230,047) for a constitutional amendment. The signatures must be filed with the secretary of state at least four months prior to the election.[25] Generally, it is necessary to pay petition circulators. For all ballot measures, it is necessary to have a strong campaign to educate the voters on the merits of the proposition. Funding this type of campaign could be expensive and requires significant commitment on the part of the proponents.
  - Ongoing state budget deficits have resulted in funding reductions for most programs as well as increased state debt. As the state's fiscal situation shows signs of gradual improvement, there will be many competing demands on resources in order to restore funds and repay debts.

Funding Options

The following are potential sources of funding for graduate medical education. These options are not mutually exclusive and each could contribute at some level.

General Fund Appropriation

This is essentially the "status quo" approach. While a strong argument can be made that the benefits of graduate medical education are realized by the general public and should therefore be funded with general fund dollars, recent history demonstrates the risk associated with this approach.

Sufficiency

Around 90 percent of general fund revenue is generated by the sales and use tax, individual income tax and corporate income tax. The table below shows general fund revenue levels since 2000. Strictly in terms of the ability to generate revenue, the general fund is capable of supporting GME. However, the challenge relates to the distribution of those funds through the appropriation process.

TABLE 19: Arizona General Fund Revenue, 2000-2012

YEAR	REVENUE (BILLIONS)	YEAR	REVENUE (BILLIONS)
FY 2012 (budgeted)	$8.8	FY 2005	$7.9
FY 2011	$8.4	FY 2004	$6.7
FY 2010	$8.3	FY 2003	$6.2
FY 2009	$8.2	FY 2002	$6.2
FY 2008	$9.6	FY 2001	$6.2
FY 2007	$9.6	FY 2000	$5.9
FY 2006	$9.3		

Source: Arizona Joint Legislative Budget Committee. Appropriation Reports, FY 2000-FY 2012.

Stability

From 1999 through 2009, the general fund was a relatively stable source of funding for GME. However, the level of support dropped from $15 million in 2009 to $0 in subsequent years. The elimination of general fund support was the result of the budget deficits caused by the economic downturn.

When there is a state budget deficit, the legislature must make difficult decisions about where to reduce spending. To complicate matters further, the demand for Medicaid (AHCCCS) is counter-cyclical, meaning when the economy falters, more people become eligible for Medicaid due to unemployment or underemployment. GME expenditures will be evaluated in the context of other healthcare spending. This puts GME funding at significant risk because cuts to GME funding will have less of an immediate impact on the public than controversial reductions in AHCCCS eligibility levels or covered services. When faced with the option of making a spending reduction that will immediately impact the public, or a spending reduction that will not impact the public for a number of years, the lawmaker is more likely to cut the long-term investment. Even if funding for GME is restored, this dynamic will still exist during the next economic downturn.

Political Feasibility

Convincing legislators to direct scarce general fund dollars to graduate medical education will require an extensive lobbying effort. Of the ninety members of the legislature, only fifty-five were in office the last time that Arizona funded GME and more turnover is expected as a result of the next election cycle. Educating the new members on the value of GME is an important component of the lobbying effort. Certain members of the current legislature are opposed to the entire Medicaid program, so convincing them to direct taxpayer dollars to support physician training could be a challenge.

Of the ninety members of the legislature, only fifty-five were in office the last time GME was funded. There is a need to educate lawmakers on its importance.

Job Training Fund

Administered by the Arizona Commerce Authority, the Job Training Program supports the design and delivery of customized training plans for employers creating new jobs or increasing the skill and wage level of current employees.[26] All Arizona employers contribute to the fund through the Job Training Employer Tax. The annual tax is levied at a rate of 0.1 percent on the first $7,000 of each employee's taxable wages. For most employers, this translates to an annual payment of $7 per employee. As Table 20 indicates, the tax generates between $11 million and $16 million per year.

TABLE 20: Job Training Tax Revenue, 2002-2011

YEAR	REVENUE	YEAR	REVENUE
2011	$11,784,372	2006	$14,653,279
2010	$12,041,812	2005	$13,317,153
2009	$14,878,923	2004	$12,350,720
2008	$16,226,493	2003	$12,549,532
2007	$15,973,538	2002	$13,371,382

Source: JLBC *2011 Arizona Tax Handbook*.

Grants from the Job Training Fund cover between 50 percent and 75 percent of the training cost for each position. The per-employee grant size is capped at $5,000 for urban employers with 100 or more employees and $8,000 for rural employers or urban employers with 100

or fewer employees. The aggregate amount that a single employer can receive is $1.5 million. At the conclusion of the training program, the average wage of trainees must meet or exceed the qualifying wage rate, which is between $18,000 and $40,000 depending on the size of the company and the county in which it is located.[27]

Companies in the healthcare industry are among the recipients of job training grants, but the funds have not been used for residency positions. Residencies are not explicitly excluded, but the administrative rules that govern the program require that training be completed within two years, which essentially eliminates residency programs.[28]

Sufficiency

Under the current structure of the program, the benefit of a job training grant would be limited. For a three year residency at a rural hospital, an $8,000 grant would contribute $2,667 per year, or 2.5 percent of the 2009 support level of $104,896. Increasing both the size of the job training fund and the maximum size of the grant is possible legislatively, although increasing the size of the fund requires increasing the job training tax. This increase in state revenue would require a two-thirds majority in both the House and Senate to pass.

Stability

The job training tax is a relatively stable source of funding, consistently generating between $11 million and $16 million annually. However, from 2008 to 2010, the legislature transferred $65 million from the job training fund to the general fund to help balance the budget.[29] As a result, those funds were not available for distribution as job training grants. During future economic downturns, the legislature may turn to fund sweeps again.

Political Feasibility

Expanding the scope of the job training program to include residency programs would likely generate opposition from entities that are currently participating in the program. Making residencies eligible without a corresponding increase in funding will increase the competition for the available funds. Passage of an increase in the job training tax rate would require a two-thirds majority in both the House and Senate. This could be difficult to achieve in a tax-averse legislature, and it could also generate opposition from industries that do not utilize the job training program, but still pay into the program.

Provider Assessment

In recent years, there has been discussion in the Arizona hospital community about the possibility of establishing a "provider assessment" that would be used to provide funding for Arizona's childless adult Medicaid population. This group is often referred to as the Proposition 204 population because they became eligible for AHCCCS as a result of a ballot initiative. In addition to funding the childless adult population, the provider assessment could be expanded to contribute to graduate medical education programs. The basic structure of a provider assessment is the following:

1. Healthcare providers make a payment to a government entity. There are many ways to determine the size of the payment made by each provider. Some examples include:
    - Alabama collects a $0.10 fee on each prescription that is greater than $3.
    - Tennessee collects a $2,225 annual fee per nursing home bed.
    - Kansas collects an annual 1.83 percent assessment on hospital inpatient operating revenues.

2. The money collected from the providers is dedicated to the Medicaid program. For a provider assessment levied at the state level, the money collected would be appropriated to the AHCCCS program. For a provider assessment levied by another government entity, such as a city or county, the funds would be transferred to AHCCCS using an intergovernmental transfer (IGT). An IGT is a mechanism whereby funds are transferred between different levels of government. For example, funds raised from a provider assessment at a county level could be transferred to AHCCCS, which is a state level government entity.[30] This Medicaid spending triggers federal matching funds at the pre-determined FMAP rate.

3. Monies derived from the assessment are used to reimburse providers for the cost of treating Medicaid patients.

In addition to funding the childless adult population, the provider assessment could be expanded to contribute to graduate medical education programs.

Sufficiency

The degree to which the provider assessment is able to generate a sufficient revenue stream to support GME depends on the negotiations that take place between the hospitals and the government entity levying the assessment regarding the size of the assessment. For example, an assessment that generates $50 million from the providers will leverage an additional $100 million in federal dollars for a total of $150 million. However, an assessment that generates $100 million from the providers leverages $200 million from the federal government for a total of $300 million.

Stability

The length of time that the provider assessment remains in effect is another item that would be negotiated between the hospitals and the government entity. It could be structured so that it remains in effect for multiple years or it may require annual legislation to renew. When considering the stability of a provider assessment, it is important to recognize that the current debate in Congress related to federal deficit reduction has prompted a discussion of curtailing or eventually eliminating the use of provider assessments. While the use of a provider assessment[31] is still currently a viable vehicle, policy makers should be aware that federal changes could make this option unavailable in the future.

Political Feasibility

Passage of a provider assessment requires a two-thirds majority in both the House and Senate, which could create challenges at the legislature. The provider assessment also faces challenges within the hospital community. The funding generated by a provider assessment is used to pay hospitals that serve the Medicaid population. However, in accordance with federal regulations, the assessment is collected from all hospitals, regardless of patient mix. As a result, hospitals that treat a high proportion of Medicaid patients receive more of the benefit than hospitals with a low proportion of Medicaid patients. Adding a GME component to the provider assessment could potentially help alleviate some of the concerns that hospitals with low levels of Medicaid have with the proposal that covers only the childless adult population.

New Dedicated Funding Stream

Arizona levies a number of taxes that generate revenue for specific purposes. Some examples include an aviation fuel tax that funds airport construction, development and improvements; an underground storage tank tax that funds cleanup costs associated with certain petroleum products and hazardous substances; and a cigarette and tobacco tax that funds various health, education, and corrections programs.[32]

One option would be to levy a tax on members of the healthcare sector such as pharmaceutical manufacturers, insurance companies, medical device manufacturers and so forth. Another option could be a tax on hospitals that do not currently participate in residency training.

A new funding stream dedicated to graduate medical education could be collected from a number of sources. One option would be to levy a tax on members of the healthcare sector such as pharmaceutical manufacturers, insurance companies, medical device manufacturers and so forth. The state of New York takes a variation of this approach, charging health insurance consumers an annual fee that is paid as part of their annual premium. The amount collected from each consumer varies depending on the exact location where they live. For example, the purchaser of a family policy in the Utica/Watertown region is charged $25.35, while a purchaser located in New York City pays $608.42.[33] Another option could be a tax on hospitals that do not currently participate in residency training. These hospitals have a vested interest in a strong GME system because they depend on residency programs at other hospitals to train their future employees.

Sufficiency

For some context, there were 880,431 Arizonans enrolled in private insurance in 2007.[34] Charging each enrollee a $25 fee could raise around $22 million. The annual revenue for Arizona hospitals that do not participate in GME totals around $12 billion.[35] A 0.5 percent tax on gross revenue could generate $60 million.

Stability

Dedicated funding streams are more stable than a general appropriation because, once in place, the revenue automatically flows to that purpose. However, during economic downturns, the legislature has demonstrated a willingness to balance the budget by "sweeping" funds that are dedicated for other purposes. Any revenue that flows to a GME fund would be susceptible to that type of sweep in the future, unless the funding stream is established at the ballot and therefore subject to Proposition 105 protections.

Political Feasibility

The creation of a new revenue stream will require a two-thirds majority in both the House and Senate or a citizens' initiative. A new fee on consumers of insurance is a tax increase on individuals who purchase their own insurance and employers who purchase health insurance on behalf of their employees. Both groups have faced significant increases in the cost of health insurance in recent years, and a new fee could be difficult to afford. Hospital revenues are facing pressures from reductions in government reimbursement rates, and further reductions in revenue that result from a tax could create additional challenges. However, a strong argument can be made that the long-term viability of a hospital depends on a sufficient supply of physicians and all hospitals should invest in the future physician workforce.

Income Tax Withholding

While income taxes are due to the state of Arizona on an annual basis, they are typically collected over time through a withholding tax that is remitted by the employer. For every paycheck, a portion of an employee's anticipated income tax liability is withheld and sent to the Department of Revenue. The amount withheld depends on the withholding rate chosen by the employee. At the end of the year, the taxpayers either receive a refund if they overpaid during the year or make an additional payment to the Department of Revenue if they underpaid.

In most cases, income tax revenues are deposited into the general fund and then used to pay for various state programs. However, it is possible to divert withholding revenues to a different fund that is dedicated to a specific purpose. An example is the Job Creation

Withholding Clearing Account, which is used to fund the Arizona Commerce Authority. The fund receives $31.5 million of withholding revenues that would otherwise be deposited into the general fund. A similar fund could be established to fund graduate medical education.[36] The withholding could be structured in a way that diverts revenue from net new job creation in the healthcare sector to the new GME fund. This structure would ensure that current revenues to the general fund would not be reduced, but new revenues, or some percentage of new revenues, say 50 percent, would be allocated to fund GME.

Sufficiency

Over the past decade, the individual income tax generated between $2.1 billion and $3.7 billion that was deposited into the general fund.[37] Arizona's healthcare sector employment is projected to grow by 44,000 by 2018. Seventeen thousand of these jobs are projected to be in the healthcare support field and the remaining 27,000 jobs in the healthcare practitioners and technical field.[38] In 2010, the median annual income for jobs in the healthcare support and healthcare practitioner fields were $25,750 and $61,152 respectively.[39] The most recent available income tax data from the Arizona Department of Revenue indicates that the average Arizona income tax liability for all returns in the $20,000 to $30,000 income tax bracket was $329 in 2006. For returns in the $50,000 to $75,000 bracket, the liability was $1,096.[40] Assuming that the new jobs pay the median wage and generate the average tax liability, the jobs will generate around $35 million in annual revenue.

Stability

Individual income tax revenues fluctuate with the economy. In addition, unpredictable levels of job growth would impact the level of funding generated for the new GME fund. However, this is a much more stable funding source than a general fund appropriation. It is using the same revenue source, but the annual appropriation process is avoided.

Political Feasibility

Diverting an existing revenue stream could be enacted by the legislature with a simple majority. Legislators may be reluctant to give up their authority to distribute funds through the appropriation process. However, diverting net new revenue is likely to be more palatable than redirecting existing revenues that would result in a reduction in current levels of general fund revenue.

Income tax withholding could be structured in a way that diverts revenue from net new job creation in the healthcare sector to the new GME fund.

Support from Private Industry

Private sector industries that sell goods and services to healthcare providers have a vested interest in supporting physician training. For example, pharmaceutical and medical device manufacturers depend on a robust healthcare system to support their businesses. There are ethical concerns related to direct contributions by private companies to teaching hospitals in support of graduate medical education, but these concerns could be addressed by creating a non-profit entity that pools funds from various industry sources and distributes them to residency programs. For example, the pharmaceutical industry, through their trade association, could establish a foundation that raises money from individual pharmaceutical companies. This money would then be distributed to teaching hospitals, but the money would not be associated with any particular company.

Sufficiency

The sufficiency of private industry funding depends on the size of the contribution by industry. State and local governments would not be involved in this type of funding arrangement, so these dollars would not trigger any federal matching funds. In order to maximize

the financial participation of private companies, advocates need to make the argument that support for GME makes sense from a business perspective. It should be framed as an investment in the healthcare system as opposed to a charitable contribution. There is a benefit to helping train physicians who will be future customers.

Stability

Expenditures that are not seen as being related to core business operations are likely to face scrutiny, particularly during economic downturns. As a result, contributions from private companies may fluctuate with the economy.

Political Feasibility

Lawmakers would not participate in the creation of this type of foundation.

Other Considerations

There are strong perceptions that any industry participation in medical education generates ethical conflicts. As a result, the design and governance of the foundation needs to be carefully structured so that there is no perception of unethical behavior. Additionally, it is important for members of the medical education community to be realistic about the future role of government funding for GME. This may require a reevaluation of funding sources that have been dismissed in the past.

The legislature does have the authority to change the way that lottery funds are distributed and could conceivably direct some of the money toward graduate medical education.

Lottery

The Arizona Lottery was established by voter initiative in 1980. Since 1980, both voters and the legislature have chosen to extend the lottery multiple times, including most recently in 2010 when the legislature extended the lottery through 2035. After prizes and administrative costs, excess funds are used to support state programs that fall into four categories: Economic and Business Development, Education, Environment, and Health and Public Welfare. During FY 2011, $146 million was distributed as follows:[41]

TABLE 21: Distribution of Arizona Lottery Revenues, 2011

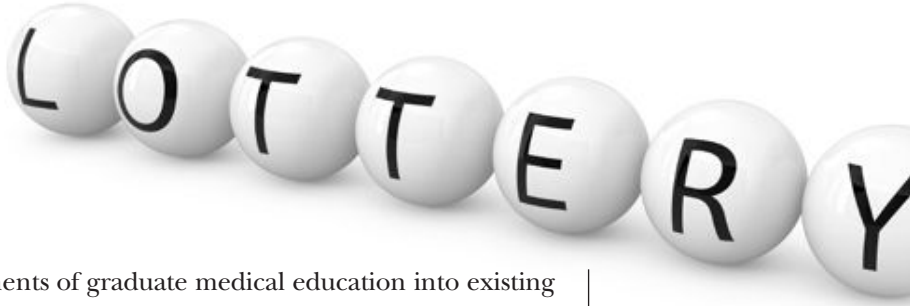
BENEFICIARY	AMOUNT	PERCENTAGE
Economic and Business Development	$3.2 million	2%
Education	$80.4 million	55%
Environment	$10.4 million	7%
Health and Public Welfare	$52.3 million	36%
TOTAL	**$146.3 million**	**100%**

Source: Arizona Lottery. http://www.arizonalottery.com/beneficiaries.html.

While the existence of the lottery is voter protected and cannot be eliminated without voter approval, the legislature does have the authority to change the way that lottery funds are distributed and could conceivably direct some of the money toward graduate medical education.

Sufficiency

The money generated by the lottery is significant. The degree to which it could sufficiently support GME depends on the distribution formula enacted by the legislature. Adding GME as a lottery beneficiary would reduce the level of funding that is available for the other programs that are already receiving funding. For example, dedicating $20 million to GME would require a 14 percent across the board cut from all other lottery beneficiaries.



It may also be possible to incorporate components of graduate medical education into existing programs funded by the lottery. For example, the Arizona Commerce Authority receives lottery funds to support economic development efforts in rural or economically disadvantaged areas. As noted at the beginning of this report, doctors have a significant economic impact on the communities in which they operate, so it could be possible for the lottery funds to serve the dual purpose of supporting economic development and physician training. In the same way, lottery funded healthcare programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), Healthy Families, Health Start and Pregnancy Prevention provide services that could potentially be delivered by residents.

Stability

As a revenue generating mechanism, the lottery is reliable. The instability results from the distribution of those revenues. Historical revenues and distributions are presented in Table 22.[42]

Table 22: Arizona Lottery Revenue and Distribution, 2000-2010

YEAR	REVENUE (MILLIONS)	DISTRIBUTION (MILLIONS)
2010	$552	$130
2009	$484	$126
2008	$472	$142
2007	$462	$137
2006	$469	$138
2005	$398	$114
2004	$367	$105
2003	$322	$92
2002	$295	$85
2001	$273	$78
2000	$259	$75

Source: JLBC *2001 Appropriation Report*.

Political Feasibility

Redirecting existing lottery revenue would not increase state revenue and would not require a super majority. There would likely be significant opposition to this proposal from current lottery beneficiaries. The legislature would need to evaluate the current distributions and prioritize which programs are most important to Arizona going forward.

Arizona Area Health Education Center

Founded in 1984, The Arizona Area Health Education Center's (AHEC) mission is to recruit students from under-represented racial and ethnic groups into the health professions, and to support healthcare professionals in underserved communities statewide. The Arizona AHEC Program is comprised of five strategically located regional centers and an administering home central office based at the University of Arizona Health Sciences Center. Each regional center collaborates with postsecondary institutions and community organizations to coordinate and support activities that target workforce development to meet the needs of Arizona's medically underserved rural and urban populations.

Currently there are many ways AHECs support and promote the recruitment and retention of primary care professionals including financial support for housing during residency rotations and travel support. This financial assistance supports students who currently exist in the training pipeline as opposed to increasing the numbers of individuals in the pipeline.

Founded in 1984, The Arizona Area Health Education Center's (AHEC) mission is to recruit students from under-represented racial and ethnic groups into the health professions, and to support healthcare professionals in underserved communities statewide.

To increase the number of student in the pipeline, AHEC could become a resource to help develop and financially support innovative approaches to training in rural and underserved areas. An example of this support has already been demonstrated when the AHEC state program office awarded funding to the Northern Arizona Area Health Education Center (NAHEC), which applied for a federal grant as a Teaching Health Center, to support the development costs for this approved family residency program.

In Arizona, AHEC could develop a residency training program that coordinates GME with community health centers, clinics and urban-based hospitals and clinics, providing the students with a diverse and quality experience. This would not compete with existing residency programs but rather open up additional training slots in rural settings without any one rural hospital or clinic taking on the entire financial burden of the residency program.

For residents, this model would create more opportunities to receive a valuable and culturally diverse learning experience. Rural hospitals and clinics do not see the same complexity and diversity of cases that are more common in urban settings. In contrast, urban settings do not provide the exposure of the challenges and access to care issues that are often experienced in rural healthcare settings. Furthermore, without experience in rural settings, it becomes more challenging to attract practitioners to these areas.

Sufficiency

The Arizona Lottery is the primary funding source for AHEC, contributing around $4.6 million in FY 2011. AHEC also received a small $500,000 federal grant from the Health Resources and Services Administration.

In addition to using its existing funding sources, the AHEC program office could also serve as an administrator of financial contributions from the private sector. Funds could be collected by a foundation or other independent non-profit agency and AHEC could identify the current healthcare workforce needs and develop a method to distribute the funds.

Pharmaceutical, medical device and biotech firms all benefit from an adequate and well-prepared workforce. Contributions could be collected and distributed in a manner that was ethical and free of bias thereby eliminating any potential conflict of interest. Universities and other agencies have strict policies in place that forbid private sectors firms (such as pharmaceutical companies) from making contributions to programs for fear of ethical violations. However, given the dire circumstances, there seems to be interest in looking at options to engage the private sector in workforce development efforts. These funds could be directed in a number of ways to increase the recruitment of physicians into rural or underserved areas. Loan repayment, preceptor development, technology enhancements and innovative interdisciplinary training demonstration projects, in addition to residency development and support, are all examples that enhance or support graduate medical education.

Stability

Funding for the AHEC model is essentially a hybrid between lottery and private funds. As a result, the stability of the funding stream shares the characteristics described in the previous discussions of lottery funds and private funds. The lottery dollars are fairly stable, while the private funding will be subject to increased scrutiny during economic downturns.

Political Feasibility

Any opposition to changes in the use of existing AHEC funding is more likely to come from parties that are involved in the current system rather than from the lawmakers. Other challenges to this approach include the perception of conflicts of interest, the potential ethical violations, as well as the public's perception that health care is being "bought out" by private industry. The fact that AHEC is housed within the University of Arizona could also pose difficulties for accepting private funding. Physicians, accrediting agencies, even hospital systems may be resistant to this type of supplemental funding as well.[43]

Summary

Table 23 summarizes the sufficiency, stability, and political feasibility of each option. Each factor is rated on a scale of one through three, with a one being the most sufficient, stable or politically feasible, and a three being the least sufficient, stable or politically feasible.

Table 23: Summary of Funding Options

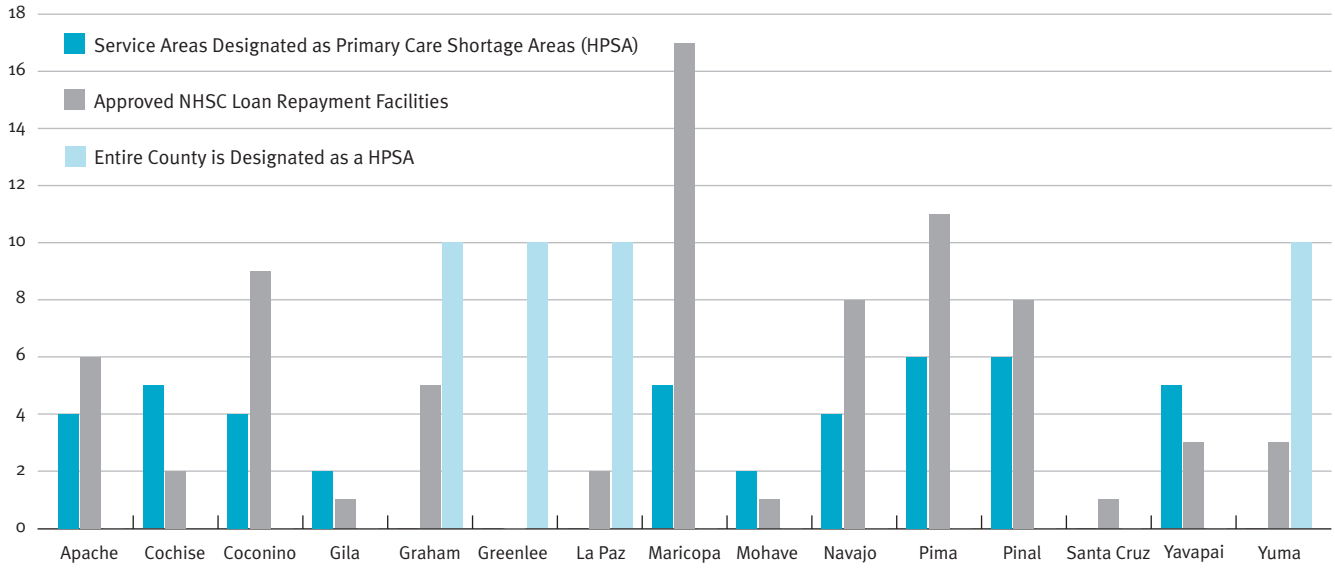
	SUFFICIENCY	STABILITY	POLITICAL FEASIBILITY
General Fund Appropriation	1	3	2
Job Training Fund	3	2	2
Provider Assessment	1	2	3
New Dedicated Funding Stream	2	2	3
Income Tax Withholding	2	1	1
Support from Private Industry	3	3	N/A
Lottery	2	2	2
AHEC	2	2	2

Other Ways to Support GME in Arizona

Loan Repayment

Rising levels of medical student debt reduces the return on investment in a medical career and can discourage talented students from choosing to pursue a career in medicine. The National Health Service Corps offers loan repayment to licensed health professionals, including primary care physician, nurse practitioners, and physician assistants, dental, and mental and behavioral health providers. It provides an opportunity for these professionals to have their student loans repaid for serving communities in need. To qualify, the practitioner must be matched with an approved NHSC facility. Chart 1 shows the distribution by county of the 77 National Health Service Corp approved facilities in Arizona.

CHART 1: Health Professions Shortage Areas (HPSA) Service Areas Vs. NHSC Approved Loan Repayment Facilities



Source: U.S. National Health Service Corps. http://nhsc.hrsa.gov/loanrepayment/index.html.

In Arizona, the Arizona Association of Community Health Centers also offers loan repayment programs through the SEARCH (Student/Resident Experiences and Rotations in Community Health) program which is for students and residents to experience medicine in an underserved primary care setting. It provides access to high quality learning experiences in Arizona's health centers and safety net providers who serve diverse populations in urban and rural areas. Training sites can be found throughout the state and offer placements for primary care disciplines such as physicians, physician assistants, nurse practitioners, dentists, dental hygienists and psychiatric/mental health professionals.

Loan repayment programs at the state and university level, such as the Arizona Medical Student Loan Program at the University of Arizona, are also incentives that attract students to careers in primary care and practice in rural and underserved areas of Arizona. At its peak in the mid 2000s, the annual general fund appropriation to this program was $1.5 million, but the legislature stopped appropriating funds for new students in the FY 2012 budget.[44]

A "tuition rebate" is another model that could be developed by a medical school. For example, all students would pay the same tuition while enrolled, but at the completion of a residency program in a primary care specialty, the school would either pay off a percentage of the student's loan or actually write a check to the physician. In effect, physicians who enter higher paying specialties would end up subsidizing the education of physicians who enter primary care.

Loans for Residency Establishment

As previously noted, hospitals begin to receive federal funding during the first year of a residency program, although there can sometimes be a delay. However, not all of the initial startup costs are eligible for federal funding, which can make the establishment of a new residency program challenging. A hospital's future federal funding is based in part on the number of residents in place at the end of a three-year start-up phase. Therefore, hospitals have an incentive to ramp up the number of residents quickly in order to maximize future federal funding even though doing so is a very costly endeavor.

Loans or grant programs can help hospitals deal with the high startup costs associated with establishing a residency program. In Arizona, a hospital loan program exists in statute, but it has only been funded once in 2007 when it received a one million dollar appropriation.[45] Through the program, hospitals that establish a new residency with at least six residents or add a new specialty with at least four residents can access up to $500,000 of interest-free financing. The program gives priority to hospitals located in rural counties.

Teaching Health Centers

The Affordable Care Act provides some opportunity for expansion of graduate medical education through the establishment of teaching health centers. Teaching health centers can include community based ambulatory care centers, federally qualified health centers, community mental health centers, rural health clinics, health centers operated by the Indian Health Service, an Indian tribe, or an urban Indian organization, or an entity receiving funding under Title X of the Public Health Service Act. According to HRSA, development grants were awarded to establish or expand primary care residency training programs in community-based ambulatory patient care centers such as federally qualified health centers and rural health clinics.[46]

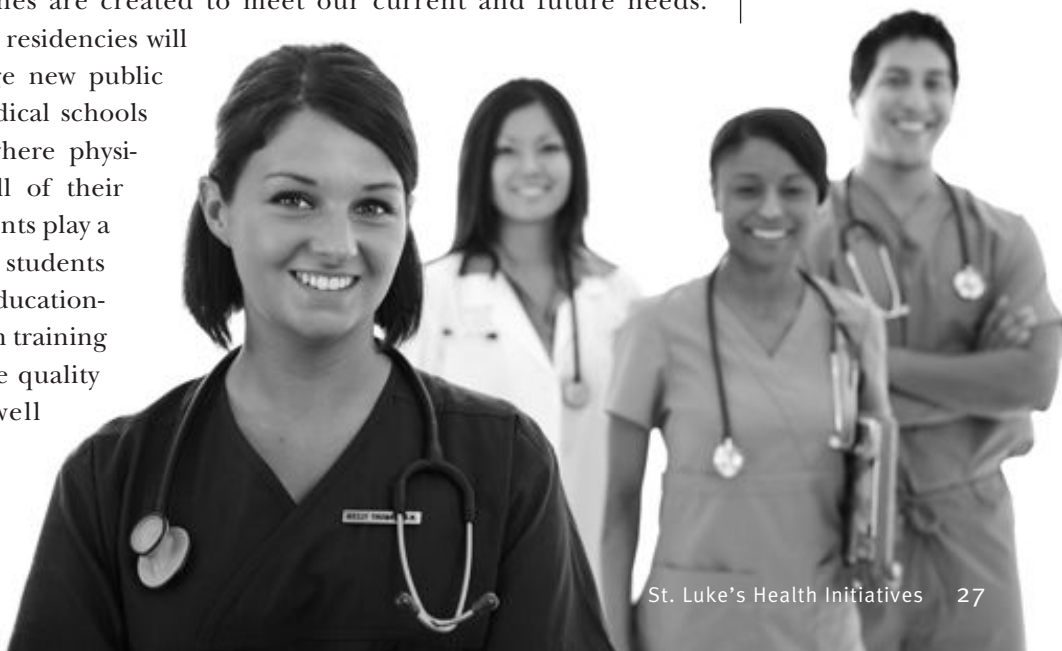
The law also authorizes the National Health Service Corps to count as much as 50 percent of time spent teaching by a Corps member in a qualified teaching health center toward fulfillment of the service obligation and directs HHS to make GME payments to teaching health centers.[47]

As healthcare delivery models continue to evolve in the U.S. and in Arizona, residency programs will play an increasingly important role in training the future physician workforce.

Conclusion

Physicians play a critical role both in delivering healthcare services to communities and generating a positive economic impact. As healthcare delivery models continue to evolve in the U.S. and in Arizona, residency programs will play an increasingly important role in training the future physician workforce. During these transformative times, it is critical that policy makers consider innovative ideas to support graduate medical education programs. It is possible that no single source of funding at the state level will be sufficient to meet the need and that a combination of public and private sources will ultimately be necessary to ensure Arizona develops a sufficient pipeline of physicians.

With the suspension of state funding for graduate medical education, Arizona is forfeiting millions in federal matching funds that could be utilized to ensure that existing programs stay in place and that new ones are created to meet our current and future needs. Maintenance and expansion of residencies will help Arizona to better leverage new public and private investments in medical schools by creating an environment where physicians are able to complete all of their training in state. Further, residents play a critical role in training medical students in the clinical portion of their educational program. Support of physician training is a wise investment to improve quality of life for all Arizonans, as well as strengthen the economy through a more vibrant healthcare sector.



Interview List

As part of the research that was conducted for this project, we interviewed stakeholders from Arizona's GME community.

ORGANIZATION	NAME	TITLE
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Arizona Hospital and Healthcare Association	Laurie Liles	President and CEO
Arizona Hospital and Healthcare Association	Pete Wertheim	VP of Strategic Communications
Arizona Medical Association	Dr. David Landrith	Vice President of Policy and Political Affairs
Arizona Osteopathic Medical Association	Amanda Weaver	Executive Director
Banner Health	Dr. Alan Leibowitz	Chief Academic Officer
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Catholic Healthcare West	Mark Hillard	CEO, CHW Service Area, Physician Integration
Catholic Healthcare West	Dr. James Balducci	Academic Chairman of the Division of Obstetrics and Gynecology in the Center for Women's Health at St. Joseph's Hospital and Medical Center
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Midwestern University	Dr. Howard Shulman	Associate Dean of Postgraduate Medical Education
Midwestern University	Dr. Greg Gaus	Senior Vice President/Chief Financial Officer
Midwestern University	Dr. Dennis Paulson	Vice President/Chief Academic Officer
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Phoenix Children's Hospital	Dr. Grace Caputo	Director, PCH/MMC Pediatric Residency Program
Scottsdale Healthcare	Michelle Pabis	Director of Government Relations
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University of Arizona College of Medicine – Phoenix	Dr. Michael Whitcomb	Flinn Medical Innovation Visiting Scholar
University of Arizona College of Public Health	Dr. Doug Campos-Outcalt	Associate Head, Family and Community Medicine
University of Arizona College of Public Health	Dr. Joe Tabor	Assistant Professor
University of Arizona College of Medicine	Dr. Jacqueline Chadwick	Former Associate Dean for Phoenix Programs
University of Arizona/ University Physicians Hospital Kino GME Consortium	Dr. Victoria Murrain	Assistant Dean for GME
Vanguard Health Systems	Reginald M. Ballantyne III	Senior Corporate Officer
Vanguard Health Systems	Dr. Tod Sugihara	Assistant Program Director, Phoenix Baptist Family Medicine Residency Program
Vanguard Health Systems	Carol Bailey	Senior Vice President of Reimbursement
Yuma Regional Medical Center	Patrick Waltz	President and Chief Executive Officer
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Yuma Regional Medical Center	Tony Struck	Chief Financial Officer
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Our Mission

To inform, connect and support efforts to improve the health of individuals and communities in Arizona. In all that we do, St. Luke's Health Initiatives seeks to be a catalyst for community health.

For a complete list of *Arizona Health Futures* publications, conferences and other public education activities, visit the SLHI web site at **www.slhi.org**. If you would like to receive extra copies of a publication or be added to our mailing list, please call 602.385.6500 or email us at info@slhi.org.

www.slhi.org

St. Luke's Health Initiatives is a public foundation formed through the sale of the St. Luke's Health System in 1995. For a comprehensive overview of our programs and activities to advance a healthy, vital and resilient Arizona, please visit our web site. We welcome your comments and involvement.

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Annual Report on Graduate Medical Education in Florida

Submitted By The Graduate Medical Education Committee

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Preface

Pursuant to s. 381.0403 (9), F.S., the Graduate Medical Education (GME) Committee, an 11-member appointed work-group, is responsible for the production of an annual report on graduate medical education in Florida.

Pursuant to section 381.0403 (9), Florida Statutes (F.S.), the Graduate Medical Education (GME) Committee, an 11-member governor's appointed workgroup, is responsible for the production of an annual report on graduate medical education in Florida. This report, provided to the Governor, the President of the Senate and the Speaker of the House of Representatives on January 15, must address the following:

(a)The role of residents and medical faculty in the provision of health care.

(b)The relationship of graduate medical education to the state's physician workforce.

(cThe costs of training medical residents for hospitals, medical schools, and teaching hospitals, including all hospital medical affiliations and practice plans at all of the medical schools and municipalities.

(d)The availability and adequacy of all sources of revenue to support graduate medical education and recommend alternative sources of funding for graduate medical education.

(e)The use of state and federally appropriated funds for graduate medical education by hospitals receiving such funds.

Members of the GME Committee share the dedication and commitment of ensuring access to high-quality health care for the citizens of Florida. The GME Committee, along with the Community Hospital Education Council (CHEC) has worked to create long-range plans and goals to improve the graduate medical education system in Florida, find new and renewed sources of funding, and provide education to policymakers and the public on the benefits and necessity of residency programs.

Acknowledgments

The Department of Health extends thanks to those who give so generously of their time and talents to ensure the continued success of graduate medical education in Florida. The Graduate Medical Education Committee members are:

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In December 2003, the Department of Health met for the first of several visits with the Southeast Regional Center for Health Workforce Studies in Tallahassee. This center, part of the Cecil G. Sheps Center for Health Services Research at University of North Carolina at Chapel Hill, has provided assistance and guidance to the department regarding physician workforce data. The department is appreciative of the Sheps Center's expertise and dedicated staff who have been extremely helpful in the department's mission to understand and better utilize its available data resources.

Executive Summary

The 2005 Annual Report on Graduate Medical Education (GME) in Florida was prepared pursuant to section 381.0403(9), Florida Statutes. Florida's GME Committee held face-to-face meetings and conference calls throughout 2005 that focused on the key issues contained in this report, including the role that graduate medical education has in relationship to the state's physician workforce and to the costs and funding of graduate medical education programs.

Graduate medical education, which is the second phase of formal education after medical school, is usually referred to as a residency. Residencies, depending on the specialty or subspecialty, are from three to six years or more in length. Medical school is the beginning of the physician's education and provides the general competencies for a graduate to enter a residency program. A residency is the time when the resident will develop his or her clinical skills and expertise by working with physician faculty members and treating patients on a one-one-one basis. Residency programs also offer physicians opportunities to network and develop professional contacts.

This report discusses research regarding the location of residency training and the location of a physician's practice after residency is completed. As an example, two Florida physicians, Kim and Vaughn Meiners, moved from Louisiana to Jacksonville, Florida, for their residencies after graduating from medical school. After the Meiners completed their residencies, they remained in Jacksonville (Florida Times-Union, 2005). National and state studies have found that the location of a physician's practice correlates more closely to the geographic location of the residency, rather than to the medical school from which the physician graduated (COGME, 2002).

Residency programs provide access to trained medical professionals for persons who are indigent, uninsured, or underserved. Residency programs also positively affect the quality, specialty or subspecialty mix of the physician workforce, and geographic distribution of physician specialists. More importantly, residency programs are substantial contributors and determinants of the supply and diversity of specialist physicians practicing in Florida. The capacity and quality of Florida's residency programs define and assist the recruitment of hightly qualified resident physician applications to Florida. These applicants may ultimately remain in the state to establish their practices. There are currently 298 allopathic and osteopathic residency programs defined by specialties of training across the state, with over 3,200 resident physicians in training at a given point in time. Even though these numbers are impressive, Florida ranks 44th of 50 in the nation in the ratio of residency training positions per 100,000 population. This is, in part, because most other states have major residency programs spanning at least a century that are larger than Florida's in relation to their populations and because of the late entry to medical training in Florida in the mid-twentieth (AAMC, 2005).

Florida is encountering rapid changes in the aging of its population, which consume a disproportionate share of healthcare resources. Florida ranks second only to California in the percentage of persons age 65 or older per 100,000 population. In 2004, 17.6 percent of Floridians were 65 or older, compared to 12.4 percent nationally. This percentage is anticipated to reach 19 percent by 2020 as baby boomers reach 65 and older (Census Bureau, 2005). As the population ages, so to does the physician workforce. Slightly more than a fifth (22 percent) of Florida's physicians are age 60 or older, and over half (50.1 percent) are older than 50. New physicians are needed to meet the growing healthcare needs of the state.

To meet the growing demand for physician manpower, Florida has been a net importer of physicians. Physicians have been locating in Florida from other states or foreign countries. Physician licensure data indicates that 34 percent of active licensed physicians with a primary practice address in Florida are from foreign medical schools.

Florida's graduate medical education programs produce highly trained residents who often remain in Florida to practice, and which helps the state meet its specialty needs, such as geriatric medicine.

Funding for graduate medical education programs comes from several sources and identified costs vary among individual residency programs, in part dependent upon variable hospital accounting practices. The largest source of funding for graduate medical education is the Federal Medicare Program, which reimburses teaching hospitals for the direct cost of operating these programs (Direct Medical Education or DME costs) and indirect costs (Indirect Medical Education costs or IME). These costs, as reported, vary from hospital to hospital and are difficult to comparatively evaluate because of:

- The variety of settings in which a resident practices (ambulatory care, outpatient clinics, and in the hospital) may be accounted in differing ways or paid from varying sources.
- The multiple responsibilities of faculty members (research, teaching, and patient care) are generally, but not universally, recognized.
- Variable methodologies are used for cost allocation related to the fact that residents might be seeing patients, while receiving training or conducting research.

Tracking reimbursement for graduate medical education programs in hospitals is challenging, because it is hard to isolate specific educational costs, and because of the different ways teaching hospitals fund graduate medical education activities. In addition, Medicare regulations do not require a hospital to distinguish between DME or IME payments for reimbursement. Incentives to collect or analyze data are formula driven, allowing hospitals wide latitude in reporting and assigning costs.

Graduate medical education funding through Medicaid is more complex than through Medicare. The Medicaid program, which is uniquely implemented by each state within board parameters, provides funding through a state and federal partnership. The Medicaid program does not recognize the cost of medical education as a separate entity, but rather there is a great deal of leeway in allotting and tracking monies, including for GME, with potentially significant variation in funding from year to year. The Florida Legislature must provide a plan to the federal government for approval that allows for inpatient and outpatient reimbursements to hospitals through the Agency for Healthcare Administration. Hospitals then provide the Florida Medicaid Program with a cost report twice a year with their calculated

rates based on the actual cost per day of treating a Medicaid patient. The Florida Medicaid Program reimburses teaching hospitals that meet certain requirements for having graduate medical education programs by specifically appropriating monies to the six statutory teaching hospitals under the GME/Disproportionate Share (DSH) Program or by allowing Medicaid GME payments under the upper payment limit (UPL) GME program. The UPL program allows the facility that meets certain requirements to actually be reimbursed at this cost level, up to the cost for a Medicare patient, rather than the lower Medicaid reimbursement rate. While some programs are granted funds for specific types of residency programs for example, children's teaching hospitals, funding remains the major concern of the Graduate Medical Education Committee and other graduate medical education stakeholders. Concerned with the adequacy of graduate medical education funding, the GME Committee focused on an analysis of current funding for graduate medical education, analyzed the changing structure of graduate medical education, and developed recommendations to improve graduate medical education for Florida residents and to meet future physician workforce needs in Florida. The recommendations addressed in this report include:

1. Develop a Central Data Repository to enable the analysis of Florida's future physician workforce needs by specialty and subspecialty distribution and geographic location. The state of Florida currently does not have a central data repository to support physician workforce data. A central database would provide a more comprehensive, valid, and reliable source for physician workforce data, allowing the state policymakers and health-practitioner stakeholders the ability to plan and prepare for the future. The committee recommends and supports the establishment of a database to provide data to facilitate informed decisions regarding programmatic and fiscal issues.

2. Florida's residency programs require a stable, accountable, recurring funding source. Current and future funding sources must be designed to incrementally increase the number of graduate medical education positions in Florida in relation to expanding and aging population needs.

   Current and future funding sources need to come with explicit accountability, including the tracking of Medicare and Medicaid funds to facilities, and with an indication of how those funds are dispersed to graduate medical education programs within a hospital. The committee recommends that a cost study be conducted to understand better the economic impact and contributions these programs make at the local and state level. This study would be based on data collected specifically for the evaluation of how Medicare and Medicaid funds are tracked in residency facilities and the value of graduate medical education programs to hospitals and the state. The study should focus as closely as possible on direct costs and assessed costs incurred by both teaching hospitals and medical schools.

3. In conjunction with the Community Hospital Education Council, the committee recommends a concerted effort in the education of policymakers and stakeholders regarding the immediacy of graduate medical education issues relative to the health of Floridians

The mission of the Graduate Medical Education Committee is to enhance the accessibility, quality, and safety of medical care for all Floridians by maintaining, improving, and expanding graduate medical education training opportunities for physicians and training them in Florida upon graduation. The GME Committee promotes this mission by continuing its focus on funding issues, on establishing a quality database, and by educating stakeholders and policymakers regarding the need for strong residency programs in Florida's communities.

Role of Residents and Medical Faculty in the Provision of Health Care

Graduate medical education (GME) is the process of comprehensive specialty training a medical school graduate undertakes to develop and refine skills specialty areas of medicine, such as family practice, internal medicine, pediatrics, obstetrics/gynecology, surgery and dermatology, or subspecialties such as pediatric oncology. This phase of education is known as the "residency" and can be three to six years or more in length, depending upon the complexity of the specialty or subspecialty area. These programs are usually located in teaching hospitals, but there has been an increasing trend towards placing residency programs, mostly in primary care specialties, in rural, and in medically underserved areas, based in outpatient clinics. These placements provide residents with exposure to underserved communities and they provide health care for patients presenting at these clinics who are often poor, uninsured, or underinsured.

The location and number of residency programs is important because these programs play a critical role as "safety net" to Florida's most vulnerable patients. Supervised by faculty, residents disproportionately serve underinsured, indigent patients in underserved areas, offering a specialty mix and comprehensive range of services and treatments to a diverse geographic distribution and population across the state. Florida teaching hospitals and resident physicians provide care to over 75 percent of Florida's medically needy citizens with an annual value of more than $900 million (Report of the Commonwealth Fund Task Force, 2002). Residency programs are accredited nationally by either the Accreditation Council for Graduate Medical Education (ACGME) or by the American Osteopathic Association Council on Postdoctoral Training. Any number of institutions can sponsor GME programs, which must meet certain accreditation standards, but not all are required to have a relationship with a medical school, although many do.

Florida has six hospitals statutorily defined under section 408.07, Florida Statutes, as teaching hospitals: Jackson Memorial Hospital, Mount Sinai Medical Center, Orlando Regional Medical Center, Shands Hospital Gainesville, Tampa General, and Shands Hospital Jacksonville. There are a total of 256 approved allopathic programs with up to 3,205 residency slots and an additional 42 approved osteopathic programs with over 450 internship and residency slots (ACGME, 2004 and AOA, 2005) across the state, with up to 70 percent of residents working in the six teaching hospitals. Florida consistently ranks among the lowest (forty fourth) in the country in terms of residency slots per 100,000 population, and needs approximately 2,500 additional slots to meet the national average (AAMC, 2005).

Residency programs are important in helping to meet physician workforce needs in Florida. Although different sources vary in their estimates of workforce needs and shortages, most GME stakeholders agree that there may not be enough physicians to fulfill demand in the immediate future (AMA, 2004). Florida's population is the fourth largest nationally, and Florida needs to evaluate how best to address physician workforce issues. Florida is already a net importer of physicians; approximately 80 percent of the current, practicing physicians in Florida came from other states or countries. Florida attracts many foreign graduates, with over 34 percent of Florida's physician workforce having attended a foreign medical school.

The Council for Education Policy, Research and Improvement (CEPRI) is a citizen board housed under the Office of Legislative Services that conducts independent policy research and analysis about education issues of statewide concern. In 2004, CEPRI published a report that outlined the cost benefit analysis of adding and expanding new medical school capacity to that of adding and expanding residency programs as a means to offer viable alternatives. The CEPRI study attempted to quantify systematically and define the state's physician workforce needs and conducted cost/benefit analyses on the best alternatives to meet a potential physician workforce shortage. This report found that an accurate estimate of physician shortage could not be addressed at this time due to inadequate data. Among the study's recommendations is the recommended creation of an official statewide physician data repository that would provide reliable, valid data used to better study physician workforce trends and the impact these trends have on graduate medical education.

Many organizations, including the Council on Graduate Medical Education and the American Medical Association, support increasing medical school capacity as a means of addressing future physician shortages. Florida currently ranks forty first nationally in the number of medical school students per 100,000 population, so this is, in part, a viable option. However, the location of the physician's residency is a better predictor of where the physician will practice than the location of his or her medical school. Nationally, approximately 55 percent of physicians ultimately practice in the state where they completed their residency training, with 68 percent of Florida primary care physicians remaining in the state after completing their residencies. Maintaining the quality of residency programs, and developing expanded capacity of residency programs, are strategies that must be developed to address the potential for physician workforce shortage. These strategies can work in collaboration with expanding medical schools enrollment.

Addressing medical school capacity without accounting for expanded or additional residencies does not offer a comprehensive solution to physician shortages nor does it address state physician workforce planning. The answer is not as simple as adding new medical schools or residency slots. GME stakeholders are interested in the long-term recruitment and retention of talented individuals into quality programs to improve access to quality care. Quality residency programs attract top medical school graduates to the state, assuring the most qualified physicians-in-training rendering care. An inadequate number of residency positions in the state, particularly in the large teaching hospitals, can result in a negative impact on access to health care.

GME programs in other states, such as Texas and Utah, have attempted to address access and delivery of healthcare issues by evaluating the recruitment and retention of residents into specific program areas. The American Medical Association (AMA) has discussed the uneven distribution of residents and doctors in specialty areas. Many physician specializing in internal medicine, for example, opt for specialty or subspecialty training, tending to then locate in certain urban areas thus there is a lack of coverage in some areas, particularly rural areas. When primary care physicians, such as internists, become specialists, this may exacerbate access to care problems in certain primary care specialties, such as emergency medicine or obstetrics.

Section 381.0403, Florida Statutes, provides for the Community Hospital Education Program (CHEP) that recommends and approves policies for primary care residencies as part of an effort to maintain community medical education and support increased primary care physicians. The CHEP program supports 59 primary care programs and collects information regarding gender and ethnicity, and graduate destination information for those residents. The 2005 Florida statistics indicated that 69 percent of CHEP residents remain in the state to continue their education or practice, as compared to 46 percent of medical school graduates (See Appendix III).

2005 Graduate Destination Report

Community Hospital Education Program

Immediately Entering Practice			Continuing Training			*Other	Total Graduates
In Florida	Out of State	Total	In Florida	Out of State	Total		
185	69	254	142	79	221	21	475
73%	27%		64%	36%			
Total Graduates Remaining in Florida		327	69%				
Total Graduates Leaving Florida		148	31%				

NOTE: The category listed as "Other" includes graduates who are undecided, taking time off, etc.

Relationship of Graduate Medical Education to the State's Physician Workforce

Over the past five years, potential physician workforce shortages have been receiving national attention. Assessing Florida's physician workforce is a difficult task that requires compiling demographic information, specialty mix information, population growth and indicators, geographic distribution of practices and incentives such as loan forgiveness or fair malpractice laws (CEPRI, 2004). In evaluating Florida's current physician workforce, a number of factors indicate there will be increased future demand for physicians, including an aging physician workforce, an aging population, and various economic indicators (MGT, 1999). Understanding Florida's current physician workforce will help identify growth and emphasize the role GME plays in fulfilling the need for physicians, specifically in critical specialty and primary care areas.

The adequacy of the health care workforce (physician manpower, allied health professionals) is currently a topic of critical importance, both nationally and in Florida. Although previous studies attempting to evaluate physician manpower suggested a physician excess, more recent studies have defined a significant shortage (Salsberg, 2003). Florida is currently a net importer of physicians with a limited number of medical schools and a critical bottleneck in graduate medical education resident physician positions. Florida needs to be able to provide a sufficient number of physicians internally, but the lack of consistent, reliable and continuous data has made projecting manpower needs difficult. In this report, some of the limited data available has been used to provide supplemental information; however, it is essential to understand that there are only minimal and often conflicting sources of information available.

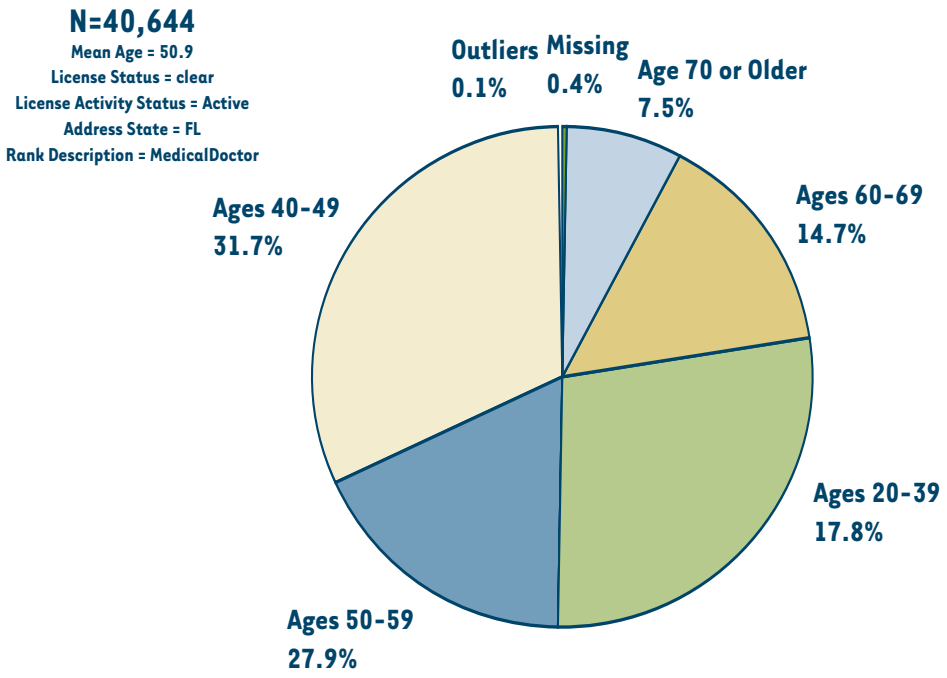
Demographic Information on Florida Physicians

Data used for this report were primarily from the Department of Health's Division of Medical Quality Assurance (MQA) physician licensure data. This data, the primary source for Florida-specific physician data, was supplemented with outside data sources, including the American Medical Association, American Association of Medical Colleges (AAMC) and various reports. The MQA data have the status defined in the MQA data dictionary as physicians that are "active" (have a license to practice in Florida), are "clear of obligations" (no open disciplinary investigations), are either allopathic or osteopathic, and have a primary business address in the state as of August 2005. Data are self-reported to MQA and assume MQA definitions including race/ethnicity definitions, which are limited to the six federally defined selections that include both race and ethnicity.

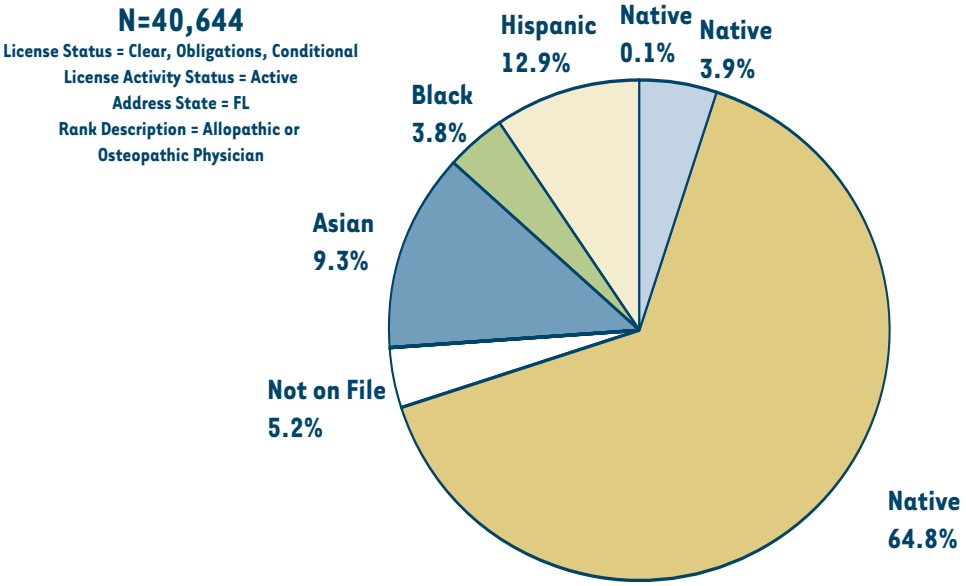
The following graph outlines the age, gender, and race breakdown from the MQA data for active, clear, osteopathic and allopathic physicians with a primary practice address in Florida from August 2005. The mean age of physicians is 50.9 years in Florida. These physicians are 78 percent male and 65 percent white.

	20–39	40–49	50–59	60–69	70 +	Outliers	Missing	Total
White Male	2840	6111	6630	3872	2018	9	59	21539
White Female	1275	1830	1071	277	259	6	7	4725
White Unknown	37	12	6	2	13	0	0	70
Black Male	202	321	275	82	26	0	5	911
Black Female	247	225	113	9	26	0	0	620
Black Unknown	8	5	2	0	0	0	0	15
Hispanic Male	690	1546	967	483	260	1	16	3963
Hispanic Female	351	543	204	55	77	0	5	1235
Hispanic Unknown	30	13	3	1	7	0	0	54
Asian Male	587	712	658	450	107	0	5	2519
Asian Female	340	350	267	195	57	1	4	1214
Asian Unknown	25	13	3	0	6	1	0	48
Native Male	2	11	10	9	1	0	0	33
Native Female	4	4	6	0	0	0	0	14
Native Unknown	0	0	0	0	0	0	0	0
Other Male	255	459	280	108	58	0	2	1162
Other Female	151	137	85	22	14	0	0	409
Other Unknown	6	1	1	1	1	0	0	10
Missing Male	76	412	648	357	126	0	41	1660
Missing Female	41	145	132	42	14	0	7	381
Unknown	25	16	15	9	11	0	4	80
Total	7192	12866	11376	5974	3081	18	155	40662

MQA Data: Age—MDs*



MQA Data: Race—DOs & MDs



Hospitals participating in the Community Hospital Education Program report the gender and ethnicity for all residents. The following table reports the totals and percentages of postgraduate years one through three for all programs.

2005 Gender/Ethnicity Report
Community Hospital Education Program

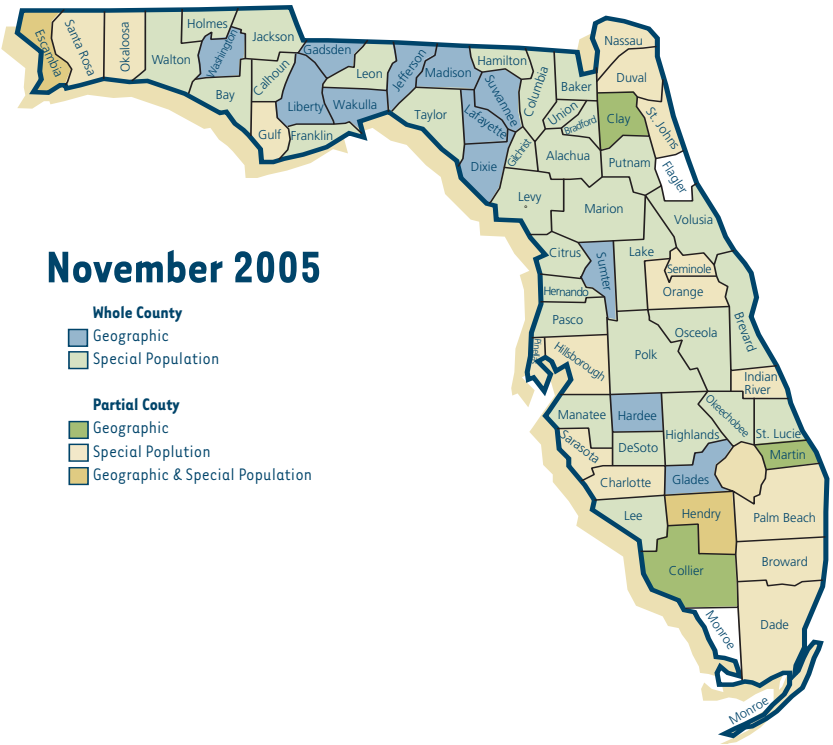
	PGY 1 Male	PGY 1 Female	PGY 2 Male	PGY 2 Female	PGY 3 Male	PGY 3 Female	Total Male	Percent of Total
Black U.S. Citizens	12	31	10	26	13	30	122	8%
White U.S. Citizens	140	141	132	137	121	130	801	52%
American Indian /Alaskan Native U.S. Citizens	2	0	2	1	0	2	7	0.5%
Asian/Pacific Islander U.S. Citizens	40	50	42	36	41	29	238	16%
Hispanic U.S. Citizens	40	48	25	40	37	53	243	16%
Foreign (Non U.S. Citizens Holding Other Visas)	26	30	16	20	10	17	119	8%
Total By Sex (Gender)	260	300	227	260	222	261	1530	100%
Percent	17%	20%	15%	17%	15%	17%	100%	
Total Males	709							
Total Females	821							
Percent Male	46%							
Percent Female	54%							

In addition to evaluating the demographic statistics of the physician workforce, it is important to analyze practice status, specialty areas and the geographic distribution of physicians in Florida. The American Medical Association Physician Masterfile (2004) ranks Florida fourth in terms of numbers of physicians, but does not account for Florida's aging population or the under representation of minorities to the overall population or accurately depict the proportion active in practice. Florida is one of the fastest growing states in the country with a total population of over 17 million people and projected to grow to over 19 million by 2020. Census data indicates that Florida's population older than 65, which comprises 17 percent of the total population, is greater than the national average of 12 percent, and the 65 and older population are expected to grow (Census Data, 2004). Persons older than age 65 often need a greater number of medical visits and treatments than younger persons, thus increasing the need for physicians in the future. It is difficult to account for minority representation using MQA data due to the limits of the self-reported category, but it appears that licensed physicians who are black are under represented compared to the state's population.

In analyzing physician workforce issues, it is important to look at gender and age. In an AMA physicians' survey, women were found to have the same number of office hours as men, but on average see fewer patients, log fewer hospital hours, and see fewer hospital patients, than their male counterparts. However, women in this survey older than age 50 put in a greater number of hours in all areas then their male counterparts (AMA, 2005). There are a number of studies that evaluate women as physicians, and younger physicians, and account for, at times, reduced hours or patient loads. These may include women in practice who also have family responsibilities, young children, dependent parents, physicians in dual-earner income families, or physicians of childbearing age taking maternity leave (COGME, 2004). Gender, race, and age remain important factors in evaluating physician supply issues. Understanding physician practice characteristics and coverage can help in determining effective methods to recruit and retain doctors, including specific programs aimed at gender issues, such as job sharing.

Health Professional Shortage Areas

More important, and with one exception, every Florida county either has a health professional shortage designation or is a medically underserved area. Finding incentives to recruit and retain physicians and residents to rural and underserved communities using federal and state programs is important to graduate medical education in Florida. Many physicians chose specialty areas or geographic locations that serve a specific area. The increased demand for specialists' services, combined with managed-care models, can influence practice characteristics. Focusing on quality residency programs that provide exposure to these areas increases the likelihood of a resident choosing to practice in that area. Having timely and accurate data becomes critical in reporting on specialty areas, practice locations, and practice characteristics.



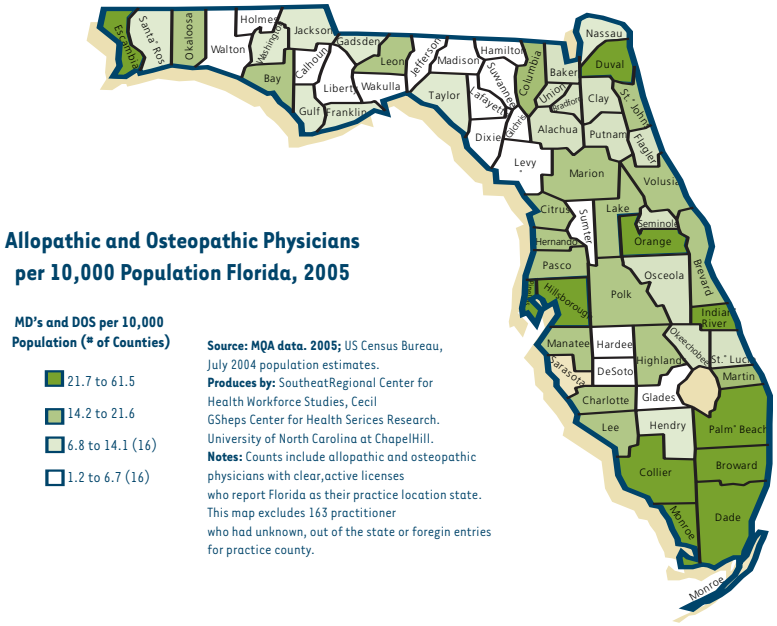
Physician Specialty Information

Using the MQA data to evaluate other physician workforce and demographic issues is limited to self-reported specialty areas and practice status. These data cannot account for a physician having multiple specialty areas or practice settings. AMA data indicates that 75 percent of Florida's physicians are involved in some capacity with direct patient care, but this is also self-reported information limited to AMA members and does not quantify hours or scope of practice. MQA data used for this report includes only "active, clear" licenses with a primary mailing address in Florida. This means a physician may have an active license, but does not necessarily practice in the state of Florida. The MQA reporting forms do not currently have a field for practice location, primary or secondary. This results in a limited measurement of physician scope of practice.

Specialty areas in MQA are limited to self-reported data to the specialty board from which the physician received his or her board certificate and in what specialty area. From the MQA data, there were over 177 specialty certificates recorded with the greatest concentration in:

- Internal Medicine-Internal Medicine 17 percent
- Family Practice 9 percent
- Pediatrics-Pediatrics 7 percent
- Anesthesiology 5 percent
- Obstetrics and Gynecology 4 percent
- General Surgery 4 percent
- Emergency Medicine 3 percent
- Internal Medicine-Cardiovascular Disease 3 percent

Enhancing Florida graduate medical education capacity, either through additional residency funded positions or by ensuring adequate, recurring funds, attracts talented residents. Providing incentives to remain in Florida for residency programs can help assure that, upon completion of residency training, physicians completing training remain in Florida for their practice location. These strategies would be particularly important in counties with low physician-to-population ratios. The figure below shows physician per 10,000 population data by county.



The Economic Impact of Graduate Medical Education

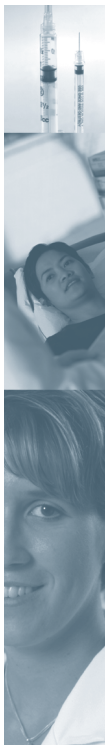
The Costs of Training Medical Residents

The cost of educating residents in programs involves education, research, and providing and documenting patient care. Traditionally, GME costs are reported in two categories, direct medical education (DME) and indirect medical education (IME). Direct costs include salaries and benefits, faculty costs, and administrative or overhead costs related directly to the program. These costs are usually determined as the cost per resident per year and are adjusted annually. Direct costs vary widely by program and cannot be systematically tracked across programs, even for the six statutory teaching hospitals in Florida. In a 1999 study, the reported direct costs of teaching hospitals included resident costs, faculty cost attributions, and overhead costs, which varied greatly by the size of the program. The smaller the hospital, the more administrative costs were distributed over a smaller number of residents. These costs, as reported but not audited by a reproducible methodology, ranged from $39,554 to $141,107 per resident physician.

Indirect costs can be even more variable and difficult to fully identify relative to contribution, as they more closely relate to a hospital's case mix. Most teaching hospitals have greater charity care costs and see a larger number of Medicaid patients than do non-teaching hospitals. Patients in teaching hospitals tend to have more complex patient conditions that may require advanced testing and costly treatments not directly related to the direct costs of medical education, but rather the programs and the case mix of the hospital. Teaching hospitals also usually have higher staff-to-patient ratios. Teaching hospitals conduct more research and have the additional task of educating young physicians, which may mean longer diagnostic exams or even longer inpatient hospitalization of not adjusted for acuity of care and risk. Calculating these factors into indirect cost is specific to each facility without a rigorously defined terminology and methodology, and in the same 1999-cost study, the numbers ranged from $65,000 to $154,000 per resident physician. It is important to note that although hospitals with residency programs may report higher cost per case, they are incredibly beneficial to the patient, the hospital, and the state. These hospitals not only provide safety net services, but also serve in the development and dissemination of new technology applied to patient care, translational research related to improved methods of patient care, and enhance quality of care.

Revenue Sources and the Use of State and Federally Appropriated Funds

The two major sources of funding for graduate medical education are the federal Medicare program, which provides direct graduate medical education subsidies and indirect medical education adjustments, and Medicaid, which is a federal-state partnership.



The Medicare program has a reimbursement formula that is based on hospital costs per resident, multiplied by the number of residents. The Direct Graduate Medical Education (DGME) subsidy covers some salary and benefits for residents and faculty members, and teaching and overhead costs. The Indirect Medical Education payments are additional funds to cover higher inpatient care and are based on adjustments made to the Diagnosis-Related Groups (DRG) for which hospitals bill. It is difficult to assess Medicare payments made to Florida hospitals, but the most recent available data indicate that, for only the six statutory teaching hospitals, direct graduate medical education and indirect medical education funding ranged from $25,000 to $125,000 per resident physician per year (AAMC, 2005).

Prior to the Balanced Budget Act of 1997, Medicare had no limits placed on the number of residents it supported, as long as the residents were enrolled in approved graduate medical education programs. Teaching hospitals received more Medicare funding per resident, particularly those in more highly specialized or extended programs. Congress expressed its concern that this funding opportunity was perceived to provide hospitals with incentives to expand the size of residency programs and to train more subspecialists, and passed the Balanced Budget Act. Since the passage of the Balanced Budget Act, open-ended payments that rewarded teaching hospitals were curtailed. Significant changes to programs were made, including caps on the number of residents supported and reductions of the Medicare Indirect Medical Education adjustments, as well as no Direct Graduate Medical Education payments to residents in non-hospital settings. Many of the teaching hospitals in Florida continue to support additional residency physician positions over their caps. For example, Tampa General Hospital's current cap is 199 resident physicians for reimbursement purposes from the Federal Government through Medicare, but they funded 259 resident physicians without additional reimbursement.

Medicaid is currently the only other source of graduate medical education funding in Florida. While there is no statutory requirement that the state support graduate medical education through Medicaid payments, Florida includes graduate medical education as part of the Upper Payment Limits (UPL) program and usually as part of the Disproportionate Share (DSH) program, as it has been consolidated in the UPL program. This funding relies heavily on intergovernmental fund transfers from local governments to match with federal dollars, which offsets general revenue in other parts of the state budget. These programs, approved by the Legislature and the federal government, allow for cost-based reimbursements derived from cost reports completed by hospitals. The DSH program has a ceiling for the total amount of inpatient and outpatient services for which reimbursement will be provided, and there are other county specific caps on reimbursements for specific procedures. The DSH program allows appropriations to the statutorily defined graduate medical education programs, but last year an appropriation for DSH was not made. Rather, it was shifted to the public hospital DSH payments, and hospitals may have seen the benefit as a hold-harmless payment or as a safety net payment, but without specific graduate medical education accountability.

Although the UPL program does not have spending caps, spending should not reasonably exceed the cost of services under Medicare. UPL is based on several formulas. Hospitals are usually reimbursed at the lowest rate rather than what their cost is; but, allowing for the removal of the requirement to pay the lowest cost, the higher costs of indigent care services are recognized, and up to 150 percent of what Medicare payments can be reimbursed at this rate. This payment is based on the previous year's cost report and is an estimate of what will be spent. It relies on the Medicaid costs divided by the number of Medicaid days to calculate the rate. The CHEP hospitals and statutory teaching hospitals are eligible to be exempt from the lower rate. This past year, this rate was reduced from 100 percent to 92 percent as a means to make up the difference between Medicare and Medicaid funding based on an estimate of what would be spent.

For fiscal year 2004–2005 (House Bill 1835, Line 202), $75,164,984 from the Grants and Donations Trust Fund and $107,351,655 from the Medical Care Trust Fund were appropriated to eliminate the inpatient reimbursement ceilings for teaching, specialty, CHEP hospitals and Level III neonatal intensive care units that met certain criteria. For fiscal year 2005–2006 (Senate Bill 2600, Specific Appropriation 190), appropriated $88,966 — 122 from the Grants and Donations Trust Fund and $127,443,907 from the Medical Care Trust Fund — to eliminate the inpatient reimbursement ceilings for teaching, specialty, CHEP hospitals and Level III neonatal intensive care units that met certain criteria. These funds are contingent upon grants and donations from state, county, or other government funds providing the state share.

The Community Hospital Education Council oversees the CHEP and recommends program standards and policies to the Department of Health. The Department of Health has historically established standards and policies for the use and expenditure of CHEP funding, which was the only source of explicit state funding to support graduate medical education, with the intent to increase the number of primary care physicians practicing in Florida. The Florida Legislature made an annual appropriation to CHEP until state fiscal year 2000–2001.

While the CHEP continues to collect data related to primary care programs, including the geographic distribution of resident physicians completing training, the benefit of receiving direct support for being a CHEP participant has limits. Unlike a direct appropriation made directly to a CHEP provider, the benefit of removal from reimbursement caps is more difficult to account. If a hospital has more than one Community Hospital Education Participant, it is still only exempt from the limits once. A hospital may also qualify under another program, including more than 11 percent charity and Medicaid days, or it is a statutory teaching hospital, and is only exempt once. Cost estimates from the Agency for Health Care Administration are not tracked through a state agency once distributed to the hospitals. There is no mechanism at the state level to identify if hospital funds received via this means are used for graduate medical education or for CHEP purposes. The Agency for Health Care Administration provides an aggregate estimate of the funding that supports CHEP hospitals in Florida through enhanced Medicaid payments based on estimates of cost reports.

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Alternative Sources of Funding

Other sources of funding for graduate medical education in Florida may include the Veterans Administration funding to the state's veterans medical centers in Miami, Tampa, Gainesville, and Bay Pines. The National Heath Service Corps, as part of the Health Resources and Services Administration, offers individual assistance for residents and physicians in underserved or designated shortage areas after the completion of the training. This program is not a direct contributor to defray the direct costs of graduate medical education in Florida's resident physician training programs. In fact, this program is used principally for repayment of medical school tuition loans through a program of debt forgiveness.

The area health education centers also support programs though the medical schools in Florida and in specific program activities the centers sponsor. In addition, children's hospitals, which frequently have limited Medicare participation, primarily only related to chronic reanl disease and certain other chronic diseases, have access to other designated funding streams through DSH funding that provides support for direct and indirect costs, although at a lower rate than the average per-resident Medicare payment.

Florida medical schools receive no specific funding for graduate medical education to support the internal costs incurred by sponsoring programs, such as faculty support for the time and effort spent in teaching resident physicians, additional support expenses, such as travel and books, and administration. Medical schools may receive some support from teaching hospitals for faculty services not directly related to the graduate medical education programs. There are other contractual agreements that individual, but not all, medical schools may participate in to help absorb or share these costs.

Recommended funding sources for graduate medial education, which have been discussed at GME Committee meetings, include:

- Exploring a "carve out" or amount calculated as representing DME and IME adjustments within Medicaid fee-for-service payments. In other states, formulas have been created to use this money as a support for existing GME programs, for primary care programs, and as grants for innovative proposals related to GME.

- Florida currently has an "Innovations" program defined in section 381.0403 (4), Florida Statutes, which has no funding allocated to it. Utah has conducted a detailed demonstration project, part of which addressed finding Medicare monies earned, but unclaimed by teaching hospitals.

- Tapping into managed care organizations in the form of capitated payment rates may be another option. Since graduate medical education costs are included in inpatient rates, the value of these could be "carved out" of managed care premiums and paid to teaching hospitals and medical schools for the allocated direct costs of programs. There are other incentives for this type of managed care carve out, one of which allows teaching hospitals to become competitive with non-teaching hospitals, because their costs for graduate medical education are now being paid for through this incentive. Utah, through carve out, has increased its state's federal match by $5 million.

Recommendations

The Graduate Medical Education Committee has supported the continuous improvement of graduate medical education programs in the state, assuring quality and fiscal support for expanding, or creating new, programs. The GME Committee's issues of concern have been reiterated and solidified in the CEPRI report and by the growing concern over physician workforce issues.

The GME Committee's recommendations are:

1. The state of Florida currently does not have a central data repository to support physician workforce data. This central database would provide a more comprehensive, valid, and reliable source for physician workforce data, allowing the state policymakers and health-practitioner stakeholders the ability to plan and prepare for the future. The committee recommends and supports the establishment of this database for informed decisions regarding programmatic and fiscal issues.

2. Florida's residency programs must have a stable, recurring funding source. Current and future funding sources need to have accountability, including the tracking of Medicare and Medicaid funds to facilities, and with an indication of how those funds are dispersed to each graduate medical education program within a hospital. To understand the economic impact and contributions these programs make at the local and state level, the committee recommends conducting a cost study. This study would be based on data collected specifically for the evaluation of how Medicare and Medicaid funds are tracked in residency facilities and the value of graduate medical education programs to hospitals and the state. The study should focus, as closely as possible, on direct costs and assess costs that both teaching hospitals and medical schools incurred.

3. In conjunction with the Community Hospital Education Council, the committee recommends a concerted effort in the education of policymakers and stakeholders regarding graduate medical education issues.

Appendix I

s. 381.0403, F.S., The Community Hospital Education Act.—

(1) SHORT TITLE. This section shall be known and cited as "The Community Hospital Education Act."

(2) LEGISLATIVE INTENT.—
(a) It is the intent of the Legislature that health care services for the citizens of this state be upgraded and that a program for continuing these services be maintained through a plan for community medical education. The program is intended to provide additional outpatient and inpatient services, a continuing supply of highly trained physicians, and graduate medical education.

(b) The Legislature further acknowledges the critical need for increased numbers of primary care physicians to provide the necessary current and projected health and medical services. In order to meet both present and anticipated needs, the Legislature supports an expansion in the number of family practice residency positions. The Legislature intends that the funding for graduate education in family practice be maintained and that funding for all primary care specialties be provided at a minimum of $10,000 per resident per year. Should funding for this act remain constant or be reduced, it is intended that all programs funded by this act be maintained or reduced proportionately.

(3) PROGRAM FOR COMMUNITY HOSPITAL EDUCATION; STATE AND LOCAL PLANNING.—
(a) There is established under the Department of Health a program for statewide graduate medical education. It is intended that continuing graduate medical education programs for interns and residents be established on a statewide basis. The program shall provide financial support for primary care specialty interns and residents based on policies recommended and approved by the Community Hospital Education Council, herein established, and the Department of Health. Only those programs with at least three residents or interns in each year of the training program are qualified to apply for financial support. Programs with fewer than three residents or interns per training year are qualified to apply for financial support, but only if the appropriate accrediting entity for the particular specialty has approved the program for fewer positions. Programs added after fiscal year 1997–1998 shall have 5 years to attain the requisite number of residents or interns. When feasible and to the extent allowed through the General Appropriations Act, state funds shall be used to generate federal matching funds under Medicaid, or other federal programs, and the resulting combined state and federal funds shall be allocated to participating hospitals for the support of graduate medical education. The department may spend up to $75,000 of the state appropriation for administrative costs associated with the production of the annual report as specified in subsection (9), and for administration of the program.

(b) For the purposes of this section, primary care specialties include emergency medicine, family practice, internal medicine, pediatrics, psychiatry, obstetrics/gynecology, combined pediatrics and internal medicine, and other primary care specialties the council and Department of Health may include.

(c) Medical institutions throughout the state may apply to the Community Hospital Education Council for grants-in-aid for financial support of their approved programs. Recommendations for funding of approved programs shall be forwarded to the Department of Health.

(d) The program shall provide a plan for community clinical teaching and training with the cooperation of the medical profession, hospitals, and clinics. The plan shall also includeformal teaching opportunities for intern and resident training. In addition, the plan shall establish an off-campus medical faculty with university faculty review to be located throughout the state in local communities.

(4) PROGRAM FOR GRADUATE MEDICAL EDUCATION INNOVATIONS.—
(a) There is established under the Department of Health a program for fostering graduate medical education innovations. Funds appropriated annually by the Legislature for this purpose shall be distributed to participating hospitals or consortia of participating hospitals and Florida medical schools or to a Florida medical school for the direct costs of providing graduate medical education in community-based clinical settings on a competitive grant or formula basis to achieve state health care workforce policy objectives, including, but not limited to:

1. Increasing the number of residents in primary care and other high demand specialties or fellowships;
2. Enhancing retention of primary care physicians in Florida practice;
3. Promoting practice in medically underserved areas of the state;
4. Encouraging racial and ethnic diversity within the state's physician workforce; and
5. Encouraging increased production of geriatricians.

(b) Participating hospitals or consortia of participating hospitals and Florida medical schools or a Florida medical school providing graduate medical education in community—based clinical settings may apply to the Community Hospital Education Council for funding under this innovations program, except when such innovations directly compete with services or programs provided by participating hospitals or consortia of participating hospitals, or by both hospitals and consortia. Innovations program funding shall provide funding based on policies recommended and approved by the Community Hospital Education Council and the Department of Health.

(c) Participating hospitals or consortia of participating hospitals and Florida medical schools or Florida medical schools awarded an innovations grant shall provide the Community Hospital Education Council and Department of Health with an annual report on their project.

(5) FAMILY PRACTICE RESIDENCIES.—In addition to the programs established in subsection (3), the Community Hospital Education Council and the Department of Health shall establish an ongoing statewide program of family practice residencies. The administration of this program shall be in the manner described in this section.

(6) COUNCIL AND DIRECTOR.—
(a) There is established the Community Hospital Education Council, hereinafter referred to as the council, which shall consist of 11 members, as follows:

1. Seven members must be program directors of accredited graduate medical education programs or practicing physicians who have faculty appointments in accredited graduate medical education programs. Six of these members must be board certified or board eligible in family practice, internal medicine, pediatrics, emergency medicine, obstetrics-gynecology, and psychiatry, respectively, and licensed pursuant to chapter 458. No more than one of these members may be appointed from any one specialty. One member must be licensed pursuant to chapter 459.
2. One member must be a representative of the administration of a hospital with an approved community hospital medical education program;
3. One member must be the dean of a medical school in this state; and
4. Two members must be consumer representatives.

All of the members shall be appointed by the Governor for terms of 4 years each.

(b) Council membership shall cease when a member's representative status no longer exists. Members of similar representative status shall be appointed to replace retiring or resigning members of the council.

(c) The secretary of the Department of Health shall designate an administrator to serve as staff director. The council shall elect a chair from among its membership. Such other personnel as may be necessary to carry out the program shall be employed as authorized by the Department of Health.

(7) DEPARTMENT OF HEALTH; STANDARDS.—
(a) The Department of Health, with recommendations from the council, shall establish standards and policies for the use and expenditure of graduate medical education funds appropriated pursuant to subsection (8) for a program of community hospital education. The Department of Health shall establish requirements for hospitals to be qualified for participation in the program, which shall include, but not be limited to:

1. Submission of an educational plan and a training schedule.
2. A determination by the council to ascertain that each portion of the program of the hospital provides a high degree of academic excellence and is accredited by the Accreditation Council for Graduate Medical Education of the American Medical Association or is accredited by the American Osteopathic Association.
3. Supervision of the educational program of the hospital by a physician who is not the hospital administrator.

(b) The Department of Health shall periodically review the educational program provided by a participating hospital to assure that the program includes a reasonable amount of both formal and practical training and that the formal sessions are presented as scheduled in the plan submitted by each hospital.

(c) In years that funds are transferred to the Agency for Health Care Administration, the Department of Health shall certify to the Agency for Health Care Administration on a quarterly basis the number of primary care specialty residents and interns at each of the participating hospitals for which the Community Hospital Education Council and the department recommends funding.

(8) MATCHING FUNDS.—State funds shall be used to match funds from any local governmental or hospital source. The state shall provide up to 50 percent of the funds, and the community hospital medical education program shall provide the remainder. However, except for fixed capital outlay, the provisions of this subsection shall not apply to any program authorized under the provisions of subsection (5) for the first 3 years after such program is in operation.

(9) ANNUAL REPORT ON GRADUATE MEDICAL EDUCATION; COMMITTEE.—The Executive Office of the Governor, the Department of Health, and the Agency for Health Care Administration shall collaborate to establish a committee that shall produce an annual report on graduate medical education. The committee shall be comprised of 11 members: five members shall be deans of the medical schools or their designees; the Governor shall appoint two members, one of whom must be a representative of the Florida Medical Association who has supervised or currently supervises residents or interns and one of whom must be a representative of the Florida Hospital Association; the Secretary of Health Care Administration shall appoint two members, one of whom must be a representative of a statutory teaching hospital and one of whom must be a physician who has supervised or is currently supervising residents or interns; and the Secretary of Health shall appoint two members, one of whom must be a representative of a statutory family practice teaching hospital and one of whom must be a physician who has supervised or is currently supervising residents or interns. With the exception of the deans, members shall serve 4-year terms. In order to stagger the terms, the Governor's appointees shall serve initial terms of 4 years, the Secretary of Health's appointees shall serve initial terms of 3 years, and the Secretary of Health Care Administration's appointees shall serve initial terms of 2 years. A member's term shall be deemed terminated when the member's representative status no longer exists. Once the committee is appointed, it shall elect a chair to serve for a 1-year term. The report shall be provided to the Governor, the President of the Senate, and the Speaker of the House of Representatives by January 15 annually. Committee members shall serve without compensation. The report shall address the following:
(a) The role of residents and medical faculty in the provision of health care.
(b) The relationship of graduate medical education to the state's physician workforce.
(c) The costs of training medical residents for hospitals, medical schools, teaching hospitals, including all hospital-medical affiliations, practice plans at all of the medical schools, and municipalities.
(d) The availability and adequacy of all sources of revenue to support graduate medical education and recommend alternative sources of funding for graduate medical education.
(e) The use of state and federal appropriated funds for graduate medical education by hospitals receiving such funds.

(10) RULEMAKING.—The department has authority to adopt rules pursuant to ss. 120.536(1) and 120.54 to implement the provisions of this section.
History.—s. 1, ch. 71-311; ss. 1-4, ch. 72-137; s. 1, ch. 74-135; s. 1, ch. 74-358; s. 1, ch. 76-63; s. 1, ch. 82-46; s. 45, ch. 82-241; s. 2, ch. 83-265; s. 6, ch. 84-94; s. 2, ch. 88-291; ss. 1, 2, 3, ch. 91-129; s. 50, ch. 91-297; s. 5, ch. 91-429; s. 25, ch. 92-173; s. 658, ch. 95-148; s. 29, ch. 99-5; s. 27, ch. 2000-163; s. 2, ch. 2001-222.
Note.—Former s. 381.503.

Appendix II

s. 408.07 (44), F.S., Definitions.—As used in this chapter, with the exception of ss. 408.031–408.045, the term:

(44)"Teaching hospital" means any Florida hospital officially affiliated with an accredited Florida medical school which exhibits activity in the area of graduate medical education as reflected by at least seven different graduate medical education programs accredited by the Accreditation Council for Graduate Medical Education or the Council on Postdoctoral Training of the American Osteopathic Association and the presence of 100 or more full-time equivalent resident physicians. The Director of the Agency for Health Care Administration shall be responsible for determining which hospitals meet this definition.
(45)History.—s. 71, ch. 92-33; s. 75, ch. 92-289; s. 13, ch. 93-129; s. 39, ch. 93-217; s. 17, ch. 95-144; s. 38, ch. 97-103; s. 2, ch. 98-14; s. 2, ch. 98-21; s. 14, ch. 98-89; s. 44, ch. 2000-153; s. 28, ch. 2000-163; s. 2, ch. 2000-227; s. 2, ch. 2003-258

2005 Gender Ethnicity Report
Community Hospital Education Program by Specialty

Emergency Medicine

	PGY 1M	PGY 1 F	PGY 2 M	PGY 2 F	PGY 3 M	PGY 3 F	TOTAL	Percent of Total
Black	0	1	0	0	0	0	1	1%
White	19	9	22	9	22	10	91	88%
American Indian/Alaskan Native U.S. Citizens	0	0	1	0	0	0	1	1%
Asian/Pacific Islander U.S. Citizens	0	0	2	0	2	0	4	4%
Hispanic	1	0	2	1	0	2	6	6%
Foreign (Non U.S. Citizens Holding Other Visas)	0	0	0	0	0	1	1	1%
Totals	20	10	27	10	24	13	104	
Total Females	33	32%						
Total Males	71	68%						

Family Practice

	PGY 1 M	PGY 1 F	PGY 2 M	PGY 2 F	PGY 3 M	PGY 3 F	TOTAL	Percent of Total
Black	7	6	5	11	8	18	55	13%
White	33	31	39	36	39	39	217	52%
American Indian/Alaskan Native U.S. Citizens	0	0	0	1	0	0	1	0%
Asian/Pacific Islander U.S. Citizens	9	13	13	10	11	13	69	17%
Hispanic	8	7	5	8	8	14	50	12%
Foreign (Non U.S. Citizens Holding Other Visas)	6	9	3	2	2	4	26	6%
Totals	63	66	65	68	68	88	418	
Total Females	222	53%						
Total Males	196	47%						

Internal Medicine

	PGY 1 M	PGY 1 F	PGY 2 M	PGY 2 F	PGY 3 M	PGY 3 F	TOTAL	Percent of Total
Black	3	9	3	2	3	2	22	5%
White	41	30	39	24	33	24	191	47%
American Indian/Alaskan Native U.S. Citizens	2	0	0	0	0	0	2	0%
Asian/Pacific Islander U.S. Citizens	18	23	22	12	20	6	101	25%
Hispanic	15	17	9	6	19	11	77	19%
Foreign (Non U.S. Citizens Holding Other Visas)	6	4	3	3	0	0	16	4%
Totals	85	83	76	47	75	43	409	
Total Females	173	42%						
Total Males	236	58%						

Internship

	PGY 1 M	PGY 1 F	PGY 2 M	PGY 2 F	PGY 3 M	PGY 3 F	TOTAL	Percent of Total
Black	1	1	0	0	0	0	2	3%
White	22	15	2	4	1	3	47	66%
American Indian/Alaskan Native U.S. Citizens	0	0	0	0	0	0	0	0%
Asian/Pacific Islander U.S. Citizens	3	1	1	2	1	0	8	11%
Hispanic	3	3	0	1	2	5	14	20%
Foreign (Non U.S. Citizens Holding Other Visas)	0	0	0	0	0	0	0	0%
Totals	29	20	3	7	4	8	71	
Total Females	35	49%						
Total Males	36	51%						

Combined Med/Ped

	PGY 1 M	PGY 1 F	PGY 2 M	PGY 2 F	PGY 3 M	PGY 3 F	TOTAL	Percent of Total
Black	0	2	0	2	0	0	4	13%
White	1	3	0	5	5	1	15	47%
American Indian/Alaskan Native U.S. Citizens	0	0	0	0	0	1	1	3%
Asian/Pacific Islander U.S. Citizens	1	1	1	1	0	1	5	16%
Hispanic	1	2	0	2	1	1	7	22%
Foreign (Non U.S. Citizens Holding Other Visas)	0	0	0	0	0	0	0	0%
Totals	3	8	1	10	6	4	32	
Total Females	22	69%						
Total Males	10	31%						

OB/GYN

	PGY 1 M	PGY 1 F	PGY 2 M	PGY 2 F	PGY 3 M	PGY 3 F	TOTAL	Percent of Total
Black	0	5	0	3	1	3	12	11%
White	4	15	3	17	4	18	61	58%
American Indian/Alaskan Native U.S. Citizens	0	0	1	0	0	1	2	2%
Asian/Pacific Islander U.S. Citizens	0	3	0	3	0	1	7	7%
Hispanic	3	3	4	5	0	0	15	14%
Foreign (Non U.S. Citizens Holding Other Visas)	2	2	2	2	0	0	8	8%
Totals	9	28	10	30	5	23	105	
Total Females	81	77%						
Total Males	24	23%						

Pediatrics

	PGY 1 M	PGY 1 F	PGY 2 M	PGY 2 F	PGY 3 M	PGY 3 F	TOTAL	Percent of Total
Black	0	6	2	7	1	4	20	6%
White	14	35	18	32	12	29	140	45%
American Indian/Alaskan Native U.S. Citizens	0	0	0	0	0	0	0	0%
Asian/Pacific Islander U.S. Citizens	7	7	2	8	4	7	35	11%
Hispanic	6	13	3	13	3	17	55	18%
Foreign (Non U.S. Citizens Holding Other Visas)	10	14	7	12	7	11	61	20%
Totals	37	75	32	72	27	68	311	
Total Females	215	69%						
Total Males	96	31%						

Psychiatry

	PGY 1 M	PGY 1 F	PGY 2 M	PGY 2 F	PGY 3 M	PGY 3 F	TOTAL	Percent of Total
Black	1	1	0	1	0	3	6	8%
White	6	3	9	10	5	6	39	49%
American Indian /Alaskan Native U.S. Citizens	0	0	0	0	0	0	0	0%
Asian/Pacific Islander U.S. Citizens	2	2	1	0	3	1	9	11%
Hispanic	3	3	2	4	4	3	19	24%
Foreign (Non U.S. Citizens Holding Other Visas)	2	1	1	1	1	1	7	9%
Totals	14	10	13	16	13	14	80	
Total Females	40	50%						
Total Males	40	50%						

Note: PGY stands for Post Graduate Year

Emergency Medicine

Physicians Immediately Entering Practice			Physicians Continuing Training			
In Florida	Out of State	Total	In Florida	Out of State	Total	Other
17	13	30	1	0	1	0
57%	43%		100%	0%		

Total Emergency Medicine Graduates Remaining in Florida	18	58%
Total Emergency Medicine Graduates Leaving Florida	13	42%

Family Practice

Physicians Immediately Entering Practice			Physicians Continuing Training			
In Florida	Out of State	Total	In Florida	Out	Total	Other
76	16	92	27	15	42	7
83%	17%		64%	36%		

Total Family Practice Graduates Remaining in Florida	103	77%
Total Family Practice Graduates Leaving Florida	31	23%

Internal Medicine

Physicians Immediately Entering Practice			Physicians Continuing Training			
In Florida	Out of State	Total	In Florida	Out	Total	Other
31	10	41	49	21	70	8
76%	24%		70%	30%		

Total Internal Medicine Graduates Remaining in Florida	80	72%
Total Internal Medicine Graduates Leaving Florida	31	28%

Internship

Physicians Immediately Entering Practice			Physicians Continuing Training			
In Florida	Out of State	Total	In Florida	Out	Total	Other
1	0	1	25	11	36	0
100%	0%		69%	31%		

Total Internship Graduates Remaining in Florida	26	70%
Total Internship Graduates Leaving Florida	11	30%

Combined Med/Ped

Physicians Immediately Entering Practice			Physicians Continuing Training			
In Florida	Out of State	Total	In Florida	Out	Total	Other
2	4	6	3	1	4	0
33%	67%		75%	25%		

Total Combined Med/Ped Graduates Remaining in Florida	5	50%
Total Combined Med/Ped Graduates Leaving Florida	5	50%

OB/GYN

Physicians Immediately Entering Practice			Physicians Continuing Training			
In Florida	Out of State	Total	In Florida	Out	Total	Other
20	7	27	3	6	9	0
74%	26%		0%	67%		

Total OB/GYN Graduates Remaining in Florida	23	64%
Total OB/GYN Graduates Leaving Florida	13	36%

Pediatrics

Physicians Immediately Entering Practice			Physicians Continuing Training			
In Florida	Out of State	Total	In Florida	Out	Total	Other
26	14	40	21	23	44	4
65%	35%		48%	52%		

Total Pediatrics Graduates Remaining in Florida	47	56%
Total Pediatrics Graduates Leaving Florida	37	44%

Psychiatry

Physicians Immediately Entering Practice			Physicians Continuing Training			
In Florida	Out of State	Total	In Florida	Out	Total	Other
12	5	17	13	2	15	2
71%	29%			87%	13%	

Total Psychiatry Graduates Remaining in Florida	25	78%
Total Psychiatry Graduates Leaving Florida	7	22%

NOTE: The category listed as "Other" includes graduates who are undecided, taking time off, etc.

This table shows the variation between quarters of residents in the various primary care Community Hospital Education Programs. Numbers are reported and verified directly from the programs each quarter.

CHEP Quarterly Reports 2004–2005
7/01/04 through 6/30/05

	INT	FP	EM	IM	OB	PED	PSY	M/P	Total
TOTAL FIRST QTR	54	407	105	382	115	308	82	28	1481
TOTAL SECOND QTR	70	384	104	390	107	308	79	27	1469
TOTAL THIRD QTR	57	388	103	386	112	302	81	32	1461
TOTAL FOURTH QTR	59	387	103	358	107	301	80	34	1429

LEGEND: INT - Internship; FP - Family Practice; EM - Emergency Medicine; IM - Internal Medicine; OB - Obstetrics/Gynecology; PED - Pediatrics; PSY - Psychiatry; M/P Combined Internal Medicine/Pediatrics

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FLORIDA DEPARTMENT OF
HEALTH

Submitted By The Graduate Medical Education Committee

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:

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

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.

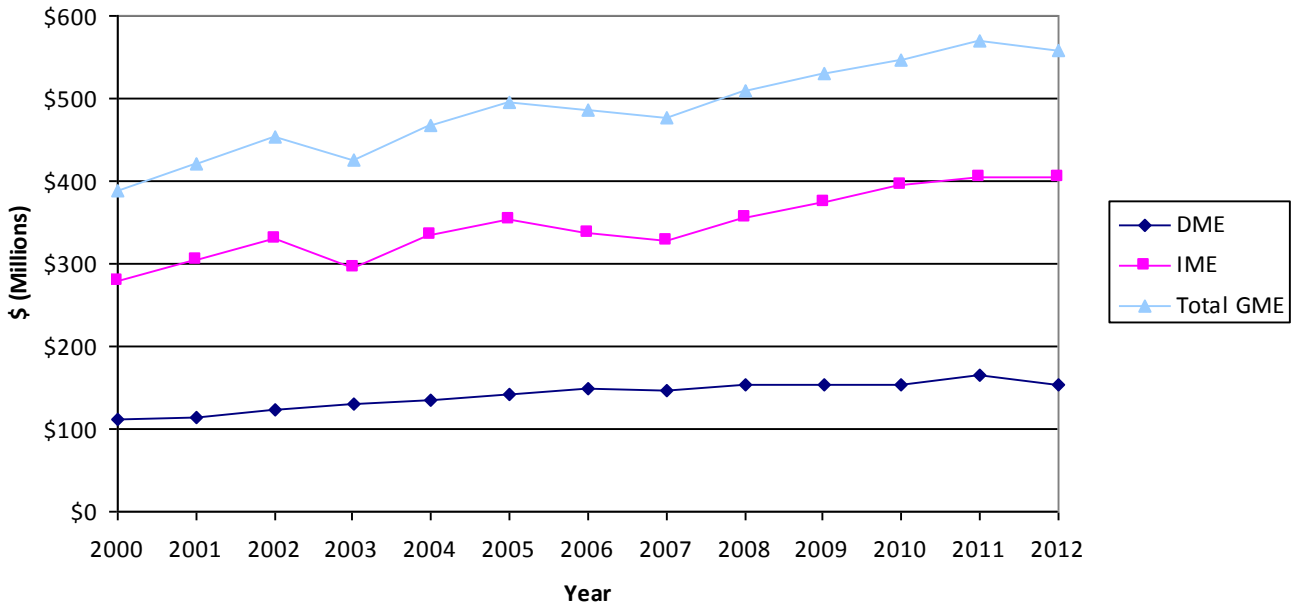
DME and IME Payments in Massachusetts

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.

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[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.

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[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:

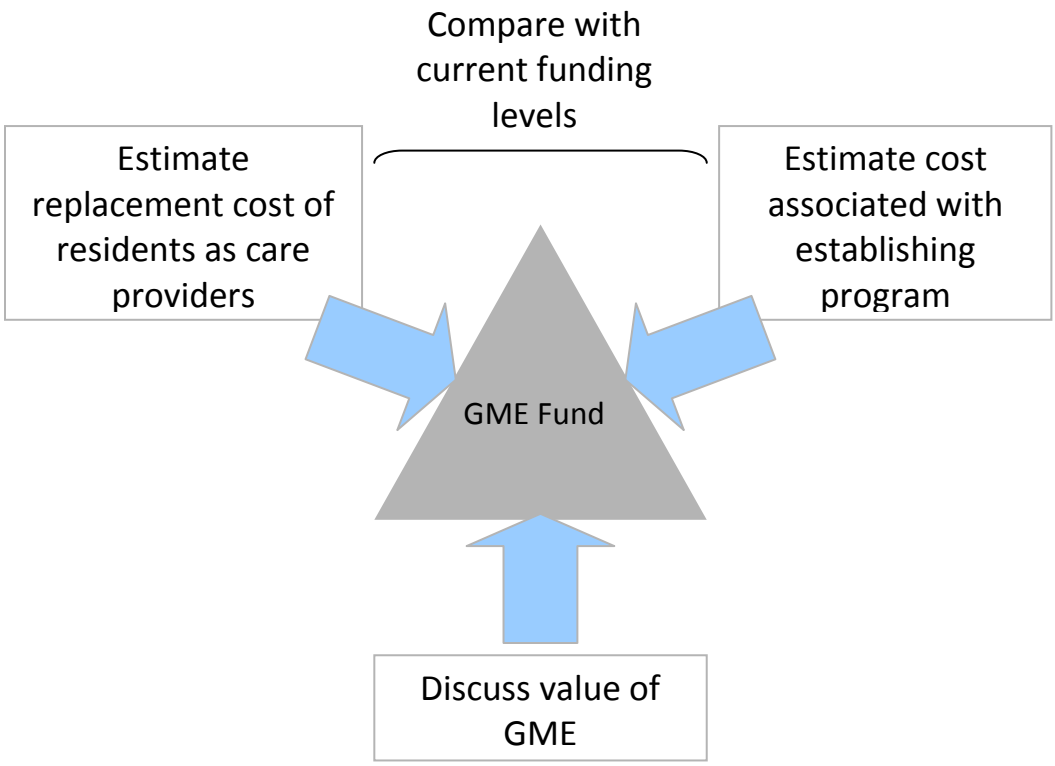
- Relevant and accessible training and learning opportunities;
- Opportunities for career advancement and career paths;

- 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

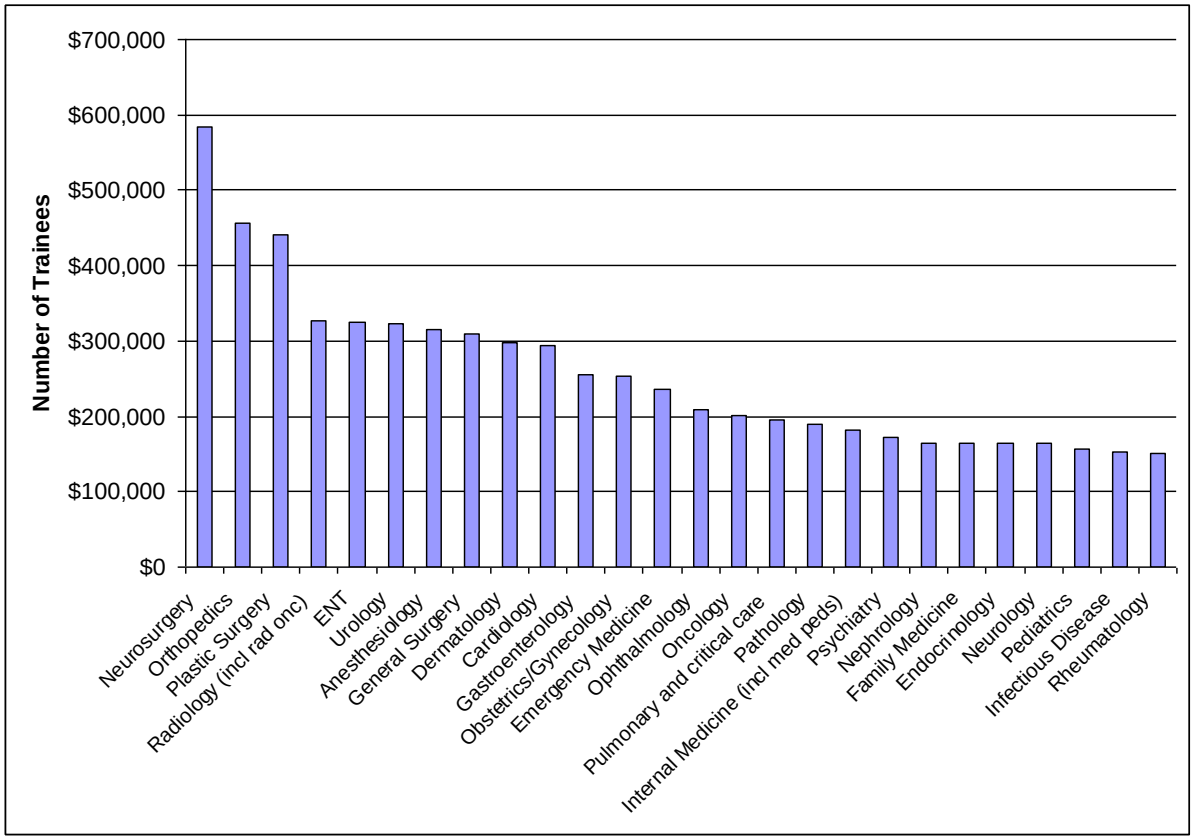
The second approach taken by the Commission was to examine the different costs associated with operating a GME program. The Commission considered three types of costs: direct costs (resident salaries and fringe), teaching costs (faculty salaries), and program costs (program director salaries and administrative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

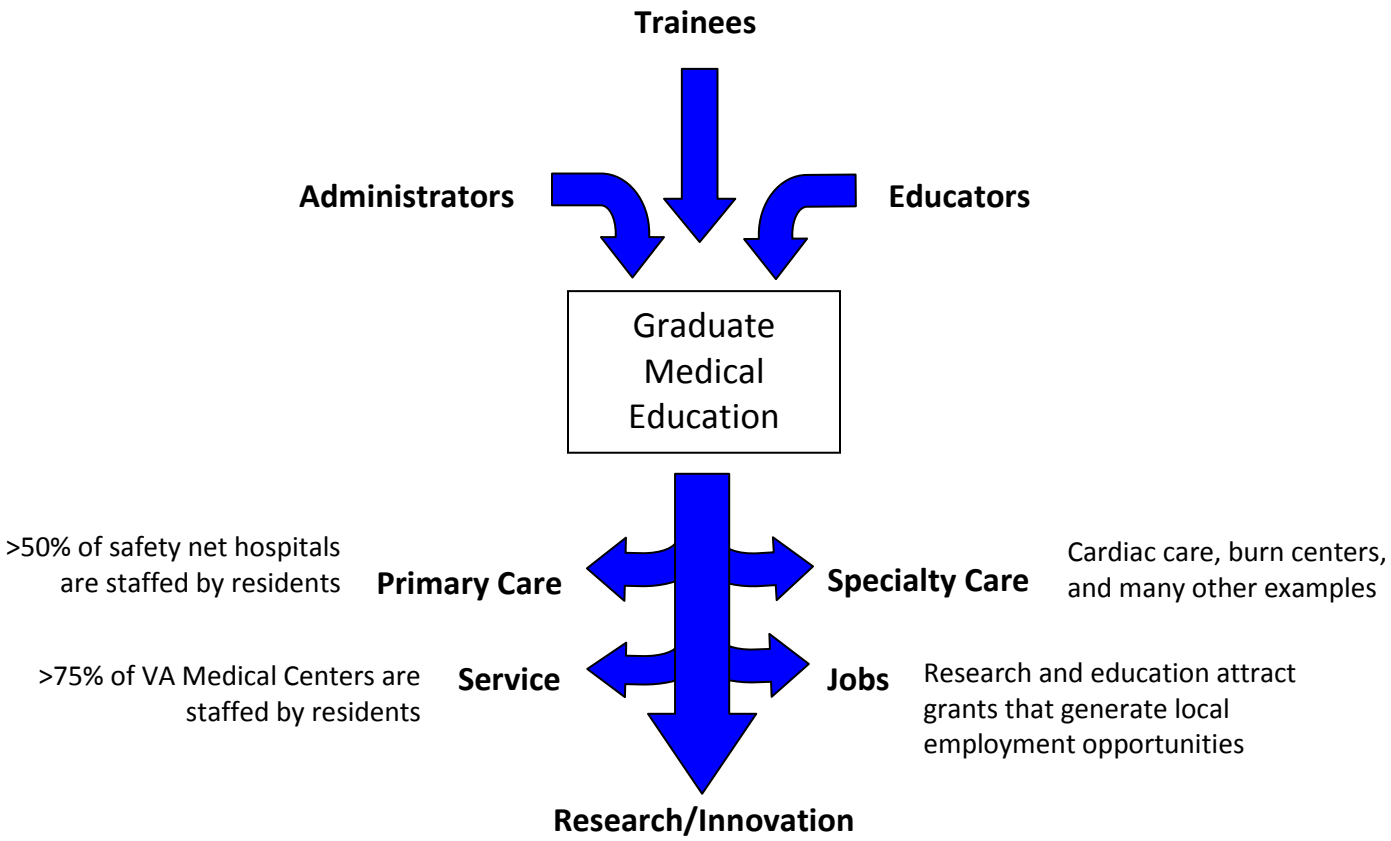
6.4 Discussion of broader value of GME

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