Medical Education on a Collision Course: Sooner Rather Than Later?
Alan K. David, MD

BACKGROUND: The escalating cost of medical education does not have transparency. This results in high percentages of medical students with progressively rising levels of indebtedness that are only exceeded by the increases in tuition. Indebtedness is a factor in specialty choice along with the “business” of medicine that reimburses procedural-based physicians much more than cognitive primary care-based services. In response to perceived increased physician demand by 2025, medical schools have increased enrollments, and new schools are online or in development. Despite the inevitable increase in medical graduates, the number of residency positions is static and may even contract. While these phenomena are being studied individually, almost no one is examining the bigger picture: increasing numbers of highly indebted students vying for static numbers of residency positions, especially in the more highly remunerative specialties. The workforce is out of balance now, and the desired workforce outcomes are not universally agreed upon, let alone how to achieve them. This collision of forces is imminent. Family medicine can become “counter culture” once again and advocate for change with education/cost data, political expertise, and outcome measures. Returning to our roots by advocating ultimately for the patient is fundamental to our discipline.

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Medical education has gone through numerous iterations of reform over the last 100 years and has become progressively expensive. The specialty distribution of its graduates has not been well connected to the health care needs of the US population. Critical events include calls for increasing the number of graduating medical students, progressively increasing levels of indebtedness, relatively static or potentially declining numbers of residency GME positions, and a work force that is deficient in primary care. These issues are on a collision course that will likely do serious damage to the medical education system and endanger the supply of physicians necessary to meet the needs of patients and society. Since the system is complex and is not governed by any single entity, the understanding of the problem and potential solutions are multi-factorial and are not simple and straightforward.

Education Reform
Medical education reform began with the Flexner report in 1910 because there were many proprietary schools with little scientific foundation and variable clinical training. The Flexnerian model for medical education was patterned after the Johns Hopkins experience that included 2 years of basic science education and 2 years of clinical teaching. This became the norm for most of medical education through the remainder of the 20th century, increasing the focus on science and the development of specialization. The cost considerations of this education reform were never a major factor in its evolution. However, Flexner felt his report had been misunderstood and mused in later years that “The medical course had become overwhelmed with science to the exclusion of the humanistic aspect of medicine.” The emphasis on scientific research and better clinical education has been measured by progressive specialization as well as increases in scientific research. The physician workforce changed from 1960 when 50% of physicians committed to primary care to only 32% in 2010.

In the last 25 years of the 20th century, medical education embraced problem-based learning, evidence-based medicine, and most recently team-based learning methodologies. More recently, the Carnegie Foundation, on the 100th anniversary of the Flexner Report, has advocated again for reform in a new medical education report titled “Educating Physicians: A Call for Reform of Medical School and Residency 2010.” Four
important principles are emphasized in this report: (1) Individualizing the learning process and standardizing learning outcomes—competencies, (2) promoting multiple forms of integration, (3) incorporating habits of inquiry and improvement, and (4) focusing on the progressive formation of the physician’s professional identity. The authors studied 11 medical schools over a 2-year period focusing not on evaluation of these schools but rather on their innovations and challenges. The authors argue for standardization of learning outcomes and assessing competencies. This could lead to greater curricular flexibility and a shortening of the educational process for those who can achieve competence early. While the authors did not do any cost analysis of old versus new educational recommendations, they did note that reforms should “result in a variety of interventions addressing the cost of medical education, length of training, and practice viability . . . .” As a result, until new models of medical education are implemented, the true cost of current and future medical education experiences are unknown and likely to continue to increase.

The Lancet recently reported on an international panel of medical education experts’ summarization of where we have been in medical education and where we need to be going. They identified three generations of educational reform in the past century: a first generation science-based curriculum, a second generation problem-based instructional innovations phase, and a new third generation of system-based competencies. The key concepts are identified in Table 1.

The effects of these generational changes in medical education have increased specialization rates and progressively increased the cost of medical education far beyond the effect of inflationary forces alone. Specialization has also dramatically increased because procedural reimbursement is much higher than time-based or cognitive reimbursement.

Medicine is a business that places more value on quantifiable data—procedures instead of time spent in history taking, patient education, or counseling. The specialty-driven system in the United States divides medical care into pieces based on organ or disease-specific categorizations; care is reimbursed on the basis of volume instead of efficiency and quality. Coordination of care is delegated to patients and their family members. The 2010 Commonwealth Fund Report suggested that while expert care in the United States is among the best in the world, the overall health care bill per capita is the most expensive in the world. The United States ranks at the bottom in population based measures of health when compared to other major industrialized nations. How is this justified?

Table 1: Transformation of Learning

<table>
<thead>
<tr>
<th>Informative (Science)</th>
<th>Formative (PBL)</th>
<th>Transformative (System based)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experts</td>
<td>Professionals</td>
<td>Leaders (Change agents)</td>
</tr>
</tbody>
</table>

The relationship between medical education reform and the cost of medical education is complex. Most medical schools are part of academic health centers (AHCs). When medical education reforms are proposed, costs are rarely calculated or discussed. In most AHCs, student tuition is expected to provide a significant proportion of the cost of the 4-year education toward an MD degree. Differences can be noted Table 2 when one compares the median tuition for public medical schools versus private medical schools.

Cost of attendance includes tuition and fees, books/supplies, transportation, miscellaneous personal expenses, room and board/living cost allowance, first time professional license exam, and dependent care. Cost of attendance is greater than tuition alone and is cross subsidized by state support, philanthropy, the clinical enterprise, and scholarships. Tuition fees increased 11.1% annually at public medical schools and 4.7% annually at private medical schools during the period 2001–2006. Overall total debt for students rose 6.9% and 5.9% per year respectively during the same period. While the cost of education has risen faster than the rise in indebtedness as a percentage, the magnitude of actual dollar indebtedness for students has risen faster due to the multiplier effect (11.1% increase in tuition rate at public school x $25,000 base = $2,775/year versus 6.9% increase in student debt x $50,000 borrowing base = $3,450). The net result is a 24% greater rise in real indebtedness compared to the dollar increase in tuition. Thirty-three percent of students owed more than $200,000, and 15% of students owed more than $250,000 after 4 years of medical education. Simply stated, medical education reform efforts have never been designed considering cost, nor have these efforts strongly considered the increasing cost of medical education, nor who pays for that education. These levels of indebtedness have increased far more than inflation and far more than physician compensation. The Association of American Medical Colleges (AAMC), in a revised 2007 report, predicted that medical school graduates in 2033 would utilize approximately 25%–31% of their after-tax income to repay their medical school loans versus 9%–12% of
after-tax income for current graduates. Evidence regarding the influence of indebtedness on specialty choice, particularly primary care versus highly remunerated specialties has been mixed until more recently. A Robert Graham Center report in 2009 clearly identified that the income differential between highly remunerative specialties and primary care incomes deters some students with high levels of indebtedness from entering a primary care specialty. A gap of more than $135,000/year separates the median annual subspecialist income from that of a primary care physician. This results in a lifetime expected income difference of $3.5 million dollars. These figures are not lost on students with high levels of indebtedness who face a lifetime of loan repayment if they choose a primary care specialty. This not only continues to perpetuate the specialist/primary care imbalance in the health care workforce, but it also may mean that students from wealthy family backgrounds will be more likely to afford to choose a career in medicine in the future. If this country is to have better access to health care for people of all backgrounds and all ages, a health workforce composed predominantly of specialists is unlikely to achieve that goal and will not result in lower costs nor major improvements in population health.

Graduate Medical Education Funding and Position Availability

The vast majority of residency positions are funded through the complex formulations for Indirect and Direct Graduate Medical Education funding by Medicare with payments going directly to hospitals in most instances. This is a $10 billion per year expenditure by the Federal government. Table 3 illustrates the number of positions available, number of US senior applicants, positions per US senior, total active applicant pool, and positions/active applicant.

While the number of available positions has increased at about the same rate as the increase in US seniors from 1976 to 2011, maintaining a fairly stable ratio of positions/US senior (1.37 to 1.41), the number of positions per active applicant has nosedived from 0.96 to 0.77. The Balanced Budget Act of 1997 capped most of the Medicare-funded positions at the 20,000–21,000 level. Thus, the majority of new positions added since 1996 (3,231) are largely funded by large AHCs. Between 1998 and 2008, there was a net loss of 390 PGY-1 family medicine resident positions, and 895 categorical internal medicine positions were converted to preliminary positions. During that same period, 40 family medicine and 25 internal medicine programs closed in contrast to the opening of 133 internal medicine subspecialty programs.

Confounding this meager growth of positions is the call by the AAMC to increase medical school class size by 30% nationwide by 2015. The addition of at least 20 new osteopathic schools in the last 20 years and the development of 13 new allopathic medical schools currently underway will result in an even larger GME applicant pool. Where will all these new graduates find a residency position or, more troubling, will they? In 2009, proposals were made in Congress to increase GME Medicare-funded positions by 15% per year, with 25% thresholds devoted to primary care and surgery. This was defeated and was resubmitted as part of the Affordable Care Act but again eliminated largely due to political and cost considerations. At the same time the number of international medical graduates (IMGs) shows no major signs of decreasing. Some medical educators predict that in the 2013 NRMP Match, there may be significant numbers of US seniors that are not only unable to find a residency position in their desired specialty but may not be able to find any residency position in which to start their graduate education.

After-tax income for current graduates. Evidence regarding the influence of indebtedness on specialty choice, particularly primary care versus highly remunerated specialties has been mixed until more recently. A Robert Graham Center report in 2009 clearly identified that the income differential between highly remunerative specialties and primary care incomes deters some students with high levels of indebtedness from entering a primary care specialty. A gap of more than $135,000/year separates the median annual subspecialist income from that of a primary care physician. This results in a lifetime expected income difference of $3.5 million dollars. These figures are not lost on students with high levels of indebtedness who face a lifetime of loan repayment if they choose a primary care specialty. This not only continues to perpetuate the specialist/primary care imbalance in the health care workforce, but it also may mean that students from wealthy family backgrounds will be more likely to afford to choose a career in medicine in the future. If this country is to have better access to health care for people of all backgrounds and all ages, a health workforce composed predominantly of specialists is unlikely to achieve that goal and will not result in lower costs nor major improvements in population health.

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Table 2: Cost of Medical Education

<table>
<thead>
<tr>
<th>Year</th>
<th>Median public medical school tuition</th>
<th>Median private medical school tuition</th>
<th>Annual median cost of attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>$27,728</td>
<td>$48,258</td>
<td>$51,300 (public) $69,738 (private)</td>
</tr>
<tr>
<td>2001</td>
<td>$30,753</td>
<td>$48,258</td>
<td>$51,300 (public) $69,738 (private)</td>
</tr>
<tr>
<td>2006</td>
<td>$48,258</td>
<td>$48,258</td>
<td>$51,300 (public) $69,738 (private)</td>
</tr>
</tbody>
</table>

Table 3: Graduate Medical Education Positions and Funding

<table>
<thead>
<tr>
<th>Year</th>
<th># Positions</th>
<th># US Seniors</th>
<th>Positions/US Senior Applicants</th>
<th>Active Total Applicants</th>
<th>Positions/Active Applicants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td>16,112</td>
<td>11,735</td>
<td>1.37</td>
<td>16,728</td>
<td>0.96</td>
</tr>
<tr>
<td>1996</td>
<td>20,653</td>
<td>14,539</td>
<td>1.41</td>
<td>24,718</td>
<td>0.83</td>
</tr>
<tr>
<td>2011</td>
<td>23,421</td>
<td>16,559</td>
<td>1.41</td>
<td>30,589</td>
<td>0.77</td>
</tr>
<tr>
<td>% Change</td>
<td>45.4%</td>
<td>41.1%</td>
<td>3%</td>
<td>82.9%</td>
<td>(19.7%)</td>
</tr>
</tbody>
</table>
medical education training. Without enough residency training to qualify to take the Step III US Medical Licensing Exam (USMLE), these MDs will not be able to get licensed in most states but will still have their medical student loan obligations to repay. This is not a desirable situation for these MDs nor for the US health care system.

Currently, graduate medical education (GME) slots are occupied in the following proportions at the PGY-1 level: 15,500–16,000 US MDs (62%), 3,000 DOs (12%), and 6,700 IMGs (26%) or 25,500 total new residents. Physician supply has grown from 202/100,000 population in 1980 to 228/100,000 in 2006. By 2025, demand is expected to rise by 8% from 228 to 246, but supply is expected to decline by 8% from 228 to 210 if nothing changes from today’s health manpower scenario.14 However, due to increasing enrollments and new schools, a 12% net growth in active physicians is projected from 2006–2025. Using similar proportions of GME entrants but larger numbers per category to reach the 12% growth/year projection, there would be a net increase of 29,000 new US MDs (6% growth), 32,900 new DOs (79% growth), and 18,900 new IMGs (12% growth) by 2025. Although total new US MD growth will be five times that of DOs, on an annual basis, many more MDs will leave active practice so that DO growth will be greater.14 These figures emphasize the need for GME expansion and reform of funding methodologies.

GME funding is being examined from two groups. First, the Medicare Payment Advisory Commission (MedPAC) recommended that Congress authorize the Secretary of Health and Human Services to change Medicare funding of GME using a new performance-based system based on several of the six ACGME standards for all residency training in order to support new workforce skill development, reduce cost, and improve the workforce quality.15 If developed, it would not take effect until 2013. Second, the Institute of Medicine recently announced the formation of a Committee on Governance and Financing of Graduate Medical Education that will examine current structure and make recommendations about modifying the GME system to produce an appropriate physician workforce for the 21st century.16

In summary, the system reforms medical education without attention to cost, passes on a portion of the increased costs of medical education to the medical students, increases the number of schools and advocates for increased class size to meet “societal need” without regard for appropriate specialty balancing of the health care workforce, and fails to make the case for new federal GME support or design a new system of financing for undergraduate and graduate medical education. These forces are colliding to create a crisis of our own making. Rather than taking place in the future, it is happening today.

Opportunities for Change

Out of crisis often comes an opportunity to create positive change if one can make the case effectively as John Kotter has outlined in much of his writing: creating a sense of urgency, assembling a guiding team, developing the change vision and strategy, and so on. Unfortunately, innovative ideas for change have rarely come from within the house of medicine.

One proposal currently being implemented is an accelerated MD degree program at Texas Tech University specifically designed for students interested in a career in primary care, especially family medicine. Two other schools in the United States and two in Canada are implementing similar options. While innovative and reducing tuition/living costs for students by about 25%, they are designed for only a small cadre of students who desire a career in primary care. The impact of this effort will be small but may lead to other innovations. Another proposal is a distributive medical school model implemented at the University of Northern Ontario using multiple sites and long distance learning with less emphasis on buildings and entrenched infrastructure than traditional schools. More experience with this model will be required to assess cost-benefit.

In the May 28, 2011, edition of the New York Times, Peter Bach and Robert Kocher suggested that society (Medicare) pay for all medical student education tuition costs, about $2.5 billion per year.18 After graduation, those students opting for a primary care residency would receive the same stipend as residents do today. Students opting for non-primary specialty fields would receive no stipends unless funded independently by a hospital or specialty department. This would eliminate indebtedness as a specialty choice determinant and might improve work force balance. It would also be much less expensive than today’s annual Medicare GME cost of $10 billion/year.

Another proposal suggests paying all direct medical education expenses for students who pass a “means” test and sign a payback contract. Those students opting for a primary care field and who practice for 10 years in that field would have no payback obligation. Students going into a non-primary training program or who pursue specialty training after an initial primary care training experience would be required to pay 10% of their annual income for the first 10 years of practice back to the student loan program. The end result could be a greater incentive to enter and stay in primary care. Specialty care with higher reimbursement rates would pay for the national student loan program.

These are innovative proposals with minimal advocacy to date—in part because the data on actual costs of medical education are not transparent; meaningful outcomes are rarely measured, and medicine has been largely driven by market forces instead of societal need and value. Family medicine started as a “counter culture” phenomena in
the 1960s and 1970s. Perhaps it is time to adopt a counter culture stance again regarding the cost, priorities, and outcomes of our medical education system. Family medicine should advocate that family physician members of the Institute of Medicine (IOM) are on the new IOM committee. Family medicine should direct some of its research expertise in a collaborative fashion toward a rational examination of the true costs of undergraduate medical education. Those costs should be compared to outcomes—3-year versus 4-year curricula, competency-based advancement versus time-based system, and costs of schools that produce more primary care physicians than others. Family medicine should be advocates for new demonstration projects such as the overlap/ blending of undergraduate medical education (UME) with GME based on outcomes. Family medicine should call for a re-examination of admission criteria for medical school based on outcome studies.

It is abundantly clear that we are on a collision course of our own making. As Rosemary A. Stevens recently noted: “… coinciding with the shift toward market oriented health care, hospitals and physicians have been seen as self interested competitors rather than guardians of the public trust or worthy of the public trust … specialty organizations fighting for turf, new revenue, and status.”

Cost of education, indebtedness, and workforce imbalance are poster children of the above. Instead, medicine must be seen as an “invaluable and irreplaceable social institution.”

This is a problem for the profession of medicine to address along with the engagement and support of society. Family medicine should be a leader in finding the right solution. Ultimately, advocating for our patients is fundamental to the origins of our discipline and identity.

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References
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