

## **NEW MEDICAL SCHOOLS IN THE UNITED STATES FORCES OF CHANGE PAST AND PRESENT**

LAWRENCE SMITH, M.D.

GREAT NECK, NEW YORK

### **ABSTRACT**

The new millennium has ushered in a growth phase in the number of American medical schools. Historically the United States has built schools during bursts of activity with relative quiescence in between these periods. We had a twenty-two year period with no growth in medical school size or number. During that time there were significant changes in patient characteristics, student culture, financial reimbursement, quality, and manpower needs that have put stress on medical schools, hospitals, clinical practice and healthcare systems. In addition, there have been remarkable new opportunities in the way we teach, including changes in teaching methodology, educational technology, and a better understanding of how students actually learn. All of these advances have taken place during a period of enormous pressure to change residency programs, reorganize medical and clinical science, and question the very need for traditional departmental structures. It is likely that the new medical schools will emerge looking different from the older schools and they are likely to catalyze a period of curricular change.

After more than three decades of virtually no growth, the United States is seeing a new flurry of medical schools in development, some of which have already received preliminary and provisional accreditation. It is intriguing to look back over the history of the formation of US medical schools to understand that the US often builds schools in response to mandates for change and accumulated manpower needs. After a historical review of the forces that shaped the founding of medical schools following the Civil War and World War II, the forces of change occurring in the United States during the three decades prior to the current surge in new medical school formation will be analyzed in detail.

Of the 124 allopathic medical schools in the United States at the year 2000, four were created in the period surrounding the formation

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Correspondence and reprint requests: Dr. Lawrence Smith, 145 Community Drive, Great Neck, NY 11021, E-mail: lawrence.smith@nshs.edu

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of the country and were in existence prior to 1800. They reflected the culture of British universities of that era where the divinity school was often premier and the medical school was an afterthought. At the time, those four schools were accompanied by many small proprietary medical schools that persisted for the duration of the 19<sup>th</sup> century (Table 1).

From 1800 to the Civil War, thirty-one of the current medical schools were founded, some based at state universities, and a significant number are amongst the oldest private medical schools that exist today <sup>(1)</sup>. There were far more schools that did not survive until the present time, most of them for-profit, small, inadequate, non-university based proprietary medical schools. These schools mirrored the young nation that was expanding westward, dominated by small towns and their simple medical needs. Little cutting-edge medicine was being taught in the United States medical schools during that time.

The attendant horrific medical care during the Civil War demonstrated that the vast majority of practitioners did not possess the minimal competencies to serve as army physicians and surgeons, and therefore revealed the inadequacy of the US medical system. Also, as a result of the Civil War some of the best medical schools in the country were destroyed and never rebuilt. The thirty-five schools created following the Civil War were almost all university affiliated and tried to correct the poor quality of medical education, but they existed amid the persistence of many small proprietary schools.

Medical training was supplemented by time spent at private non-degree institutions, time spent as house pupils, and for the best students, time spent studying abroad. In Europe, future leaders of American medicine spent time studying first in France and then later in Germany to supplement the teaching of the American medical schools. More and more of the schools formed during this time began to mimic the better medical schools that existed in Western Europe. These new medical schools were formed in response to the need for the United States to catch up with both the observational and experimental sci-

TABLE 1  
*Historic Periods in American Medical School Development\**

- 
- Pre 1800 <sup>(4)</sup>
  - Pre Civil War <sup>(31)</sup>
  - Post Civil War <sup>(35)</sup>
  - Post Flexner Report <sup>(9)</sup>
  - Post World War II to 1978 <sup>(45)</sup>
  - Plateau phase 1978–2003 <sup>(1)</sup>
  - Millennial growth and development? <sup>(13)</sup>
- 

\* No. of medical schools founded in parentheses.

ence occurring in Europe, especially around anti-sepsis, better surgical techniques, the use of the medical laboratory and finally the creation of dedicated academic faculty to teach in medical schools (1, 2). This movement coincided with the development of the modern university in the United States.

The Flexner Report issued by the Carnegie Foundation in 1910 was a scathing assessment of the state of medical education in the United States; few medical schools received high ratings. The report was most critical of non-university based medical schools that did not include science and laboratory training in their curriculum. The report was particularly condemning of proprietary medical schools and argued for their elimination. Working with the AMA and state licensing boards, the Carnegie Foundation was effective in reforming the shape and texture of American medical education. University-based medical schools with academic faculty, science laboratory exercises, sequential curricula and a requirement of significant pre-medical undergraduate education became the norm. It was within this period that the Johns Hopkins School of Medicine was founded. Johns Hopkins quickly re-defined medical education, not only for the United States, but ultimately for the world. Despite the Flexner Report's call to change the culture and substance of medical schools, only nine new schools were formed between 1910 and World War II.

Following World War II, there was recognition that the physician workforce was inadequate for the growing population. Simultaneously the GI Bill empowered middle class men to attend college. This put enormous strain on the existing medical schools to admit all of the qualified veterans desirous of becoming physicians. In response to these two pressures, as well as the growth of science stimulated by the NIH, the shift toward specialized practice, the recognition of the need for community-based schools and the enormous need for more academic faculty, there was a large post World War II expansion of medical schools. Forty-five new schools were created from the late 1960's until 1978. This remarkable construction of medical schools was also partially spurred by federal and state incentives. These schools followed one of two pathways, traditional research based or community based.

After 1978, there was a nearly three decade plateau, during which no new medical schools were created and there was virtually no growth in the size of the graduating US medical school class. This plateau phase persisted until the new millennium, when there was again recognition of a need for more US medical school graduates. This data led to a call from the AAMC to increase the size of the graduating class, and as a

result, currently there are at least thirteen new medical schools proposed in the United States (3-5).

### THE PLATEAU PHASE

During the three decade when no new medical schools were formed, significant changes occurred that led to the need for expansion. The population continued to grow and age. There was increased demand for highly technical and sophisticated medical care. To meet these ever increasing needs there was an importation of physicians trained outside of the United States. Further, because many qualified students were unable to obtain admission to US medical schools, for-profit Caribbean medical schools graduated many US citizens who returned to fill the void (6). Thus, once these Caribbean students passed the USMLE examination, they returned for their post-graduate training. Of the approximately 25,000 PGY1 positions in the United States, the US medical school class was supplying approximately 17,000. The gap has been filled by foreign-trained foreign physicians, osteopathic graduates taking allopathic training, and US students returning from medical study abroad. The majority of these 25,000 trainees successfully find positions in the United States; thus it is clear that we have had a hidden manpower subsidy to compensate for an inadequate U.S. medical school enterprise.

Let us now look at some of the forces of change that have evolved during this three decade plateau phase that will ultimately influence the shape of the schools in formation currently (7).

#### *Current Forces of Change*

##### **A) Workforce Gap**

Not only has medical education failed to produce sufficient numbers of physicians, but due to many factors, including the education system, young physician preference, and the financial reimbursement system, we have created significant selective manpower shortages (8) (Table 2). We lack primary care physicians in all settings, physicians for rural practice, medical care scientists, general surgeons, public health physicians, geriatricians, obstetricians, and more, while we significantly over produce many highly specialized doctors who have created issues of supply sensitive overuse (9).

Patients have also placed tremendous demands on the health education system. Many parties are exerting enormous pressure for more medical care, including dissatisfied patients seeking more care and/or

TABLE 2  
*Workforce Gaps*

- 
- Primary care physicians
  - Medical scientists
  - General surgeons
  - Public Health physicians
  - Geriatricians
  - OB, Emergency Medicine
  - Aging/early retirement workforce
  - Young physician focus on life-style
  - Geographic mal-distribution
- 

alternative practitioners. Patient advocacy groups have changed patients into consumers, and the managed care industry has created an adversarial business environment for the practice of medicine. There is a crisis of trust <sup>(10)</sup> between patients and physicians, there is ever increasing uninsured, and health care disparities continue unresolved. There is a perceived mismatch between the products of our medical education system and the perceived and real needs of our patients. These pressures have pushed the health care system in many discordant directions that have distracted it from its fundamental goals. We are facing a public revolution in loss of confidence in American medicine and medical education.

## B) Student Factors

Students considering medicine as a career and entering medical school have also changed radically. The cultural and life perspective of generations X and Y are radically different from the prior generations; young people now put an enormous emphasis on balance in life and preservation of ones' free time <sup>(11)</sup> (Table 3). These generational issues have been poorly integrated into the culture that is the profession of medicine. The majority of trainees in the pipeline are women. Many young physicians are dual professional couples. Personal educational

TABLE 3  
*Student Factors*

- 
- Generational issues
  - Older/dual professional couples
  - Majority women
  - High debt
  - Training too long
  - Loss of economic diversity
  - Inadequate ethnic/racial diversity
-

debt has risen and training has taken longer and longer. Sadly, because of educational debt, there has been a loss of economic diversity of those attending medical school, and we have also failed to improve the racial diversity of our young physician workforce. All these factors put further pressure on the need for new and creative ways to recruit and educate future physicians <sup>(12)</sup>.

New educational strategies must aim to create a more learner-centered environment. We need to re-evaluate medical education and make sure our teaching methods are consistent with the way this new generation learns best, instead of the way that faculty likes to teach. This will force a re-evaluation of all our educational strategies.

### C) Medical School Issues

As we begin to address the inadequacies of the US medical education system, it is important to understand how medical schools have evolved over time. Faculty are so preoccupied with generating clinical income that despite enormous growth in the total number of faculty in this country, they have no time to teach <sup>(13)</sup>. The research enterprise has grown into big business leaving education as the orphaned mission of medical schools. It is clear that the medical schools in formation will come into existence with a primary goal and mission of creating a successful medical education enterprise. This wave of new schools is likely to be a catalyst of change throughout the entire medical educational system (Table 4). Hopefully, we will focus on learning instead of teaching, learning time instead of teaching time to pace our curriculum, and mastery of competencies and critical thinking instead of regurgitation of facts in our assessment methods.

### D) Hospital and Residency Factors

The heart and soul of medical education in the United States is the academic medical center and the teaching service of the teaching

TABLE 4

*Medical School Factors*

- 
- Economic pressure devalues the educational mission
  - Admission process questionably effective
  - Poor utilization of pre-med time
  - Science of medicine not learned well
  - Anachronistic department structures
  - Poor leadership development
  - Reward system fails to value teaching
-

TABLE 5  
*Hospital Factors — “The Clinical Service”*

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- Very ill patients, highly specialized care
  - Rapid pace, reduced length of stay (LOS), day of procedure admission
  - Absence of many common illnesses
  - No time for reflection
  - Loss of role as “center of doctor’s lives”
  - Economically strained, competitive environment
  - Shift to ambulatory care
  - Spread of specialty care to non-AMC’s
  - Transparency
  - Safety/Quality/Efficiency (Value)
  - Patient Satisfaction
- 

hospital. However, this clinical service has changed significantly. Patients are often treated in ambulatory settings where we have yet to develop highly robust training models (Table 5). Those admitted to the hospital are extraordinarily ill, the pace of care is rapid, the length of stay short, and the number of tests performed on each patient is excessive. Moreover, it is often unclear if any doctor is truly in charge of care because of the plethora of specialists that descend on each patient. The models of care have dramatically changed in only a few years past and all to the detriment of education (Table 6). With no time for reflection, socialization, or fun, the life of the practicing physician and the house officer has changed radically in the teaching hospital. Without a serious look at redesigning hospital based training for both medical students and residents, we are unlikely to succeed in creating a new model of clinical education <sup>(14)</sup>.

Further, the privileged and autonomous role of the physician is being challenged by the movement toward transparency, public reporting of quality, the need to prove value, a wide dissemination of patient satisfaction data, regulator interposition of barriers in every aspect of

TABLE 6  
*Hospital Factors — “The Model of Care”*

- 
- Indefensible variation in common practice
  - More care appears worse
  - Episodic, poor transition of care
  - Super-specialized
  - “No one in-charge”
  - Poor management of chronic diseases
  - Poor management of the dying patient
  - Erratic/convenient use of evidence
  - Delivering justifiable rather than “indicated” care
  - Loss of the master clinician role model
-

TABLE 7  
*Patients*

- 
- Consumer movement
  - Seek “alternative” practitioners
  - Represented by insurers and advocacy groups
  - Crisis of trust
  - Baby-boomer crisis
  - Health care disparities unresolved
  - Less willing to be “learned-on”
  - Lack of access
- 

medical practice, the intrusion of managed care on physician decision making, and a demand to transition from physician centered care to patient centered care. Patients have changed; they are now more like consumers, they have lost trust in health care and they are much less willing to agree to possibly less safe care under the umbrella of “teaching young doctors” (Table 7).

Because of the work hour restrictions and the increased supervision of residents precipitated in the Libby Zion case of the late 1980s, we have seen residency programs undergo changes to accommodate these new work pressures, creating serious deficiencies in their underlying core mission <sup>(15)</sup>. In graduate medical education, there has been an evolution of a shift-work mentality and a loss of the sense of personal ownership and responsibility for ones’ patients (Table 8).

Residency training is now being followed by further specialty training fellowships in so many fields that we have lost sense of the end-product of our residencies. The loss of focus of our clinical training needs to be grappled with and solved in order to move forward in medical education. The classic model of the clerkship also needs to be reexamined as to whether it remains the most effective model of clinical education and clearly student learning must be imbedded in residency teaching services that have successfully cleared the hurdles of the modern hospital.

TABLE 8  
*Resident Factors*

- 
- Work hour restriction and the effects of the “solutions”
  - Hyper-regulated by RRC’s
  - Shift-work mentality
  - Loss of ownership of the patient and the service
  - No clear end product of residency
  - Generation X factors
  - Loss of time to socialize into the profession
  - Over-supervision - patient safety vs. emotional learning
  - Disappearance of master clinician and physician scientist from the “wards”
-



## CONCLUSION

As many new medical schools open their doors at the beginning of the 21<sup>st</sup> Century, many of the issues raised here need to be addressed and therefore will clearly shape the curriculum and culture of these schools. The new schools will have the advantage of learning from many educational experiments of the past as well as using incredible new and future technology to supplement the traditional pedagogical techniques. Recognition of the changed model of care delivery, the new skill sets of the master clinician, rapidly advancing medical science and the need to restore trust all implicate a need for radical new ways to train young physicians.

With a blank slate the new medical schools have an amazing opportunity to be the laboratories for extraordinary and daring experiments in medical education. The organization of departments, the timing and sequencing of learning, the use of innovative pedagogy and technology, and the reorganization of clinical training are all issues that may be easier tackled when there are no prior turf issues to deal with. Over the next decade we will all see reports on the results of these experiments and it is likely that these new millennial medical schools will catalyze change throughout the entire educational system.

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## DISCUSSION

**Goldfinger, Boston:** I see at the very bottom of this slide the statement, “control the curriculum of education”. Seems to me the curriculum of education for physicians goes far beyond medical school and, indeed, beyond their period of residency or even fellowship. We all recognize the plight and difficulties in achieving our goals in continuing education. I wonder what your thoughts are on that.

**Smith, New York:** Well, in our particular case, we have 91 approved residencies that have preexisted medical school in our health system, we run a robust CME program that may or may not influence anyone’s behavior, but certainly solves their CME hours issues. We are going to take on the whole continuum. From day one, we are looking at pipeline programs to medical school, the pre-med curriculum at least at the University that we are going to influence, and we are already dramatically pushing changes in the GME programs to be ready for students emerging from this new curriculum. CME is probably the toughest of all of the issues, but we are not leaving that either, and they are at the table in the redesign of the whole concept of active learning and personal responsibility for continuing to change and move toward excellence whether we will succeed or not. But I think that with the residency programs and at least our own pre-med programs, we have a really good chance of succeeding at that continuum.

**Thibault, New York:** Thanks, Larry. That was very inspiring and uplifting, and as you know, the Macy Foundation is very interested in this phenomenon and hopes to promote it as a time for innovation. I have two questions, in spite of your very upbeat message. One is that if one looks historically, there was a lot of promise of innovation in the explosion that happened in the 60s and 70s. When one looks back though, there was a tremendous amount of movement to conform to the existing standards, and there is a lot of fear now that in spite of the promise of innovation, that we are going to end up with schools that actually look just like those that we have. Can you comment on what some of the barriers are going to be to innovation and how we are going to overcome that? The second question is that you’ve eluded to teamwork, but the question of what we are going to do to get our professional schools together to be able to model and experience teamwork earlier on in the educational process, what your thoughts are and some of the other people that are building new medical schools are about getting together with the other professional schools early on?

**Smith, New York:** So the first issue is what are the likely barriers to real creativity? Well, the one that stands out is the LCME, and if the LCME approaches the accreditation of these new medical schools with extraordinary rigor that implies that you have to have every “I” dotted and every “T” crossed perfectly the way it used to be, there is going to be a problem. I will tell you that without an old-fashioned departmental structure and an old-fashioned core structure, it is really hard to just fill out the forms, because the forms are completely organized in a way that is almost impossible to actually convey what you are going to do, because it is all divided in the old structure. My belief, however,

is that the LCME's approach to at least the first three or four schools has been to prove to us that you have to have resources to stay in business and to prove to us that you have to have a governing structure that ensures integrity and we will leave your curriculum alone; and that has been the approach to the first few schools, and I think if the LCME continues to do that, we are going to see a lot of creativity. The other major inhibitor of creativity is USMLE Step 1. If it continues to be a post-second year hurdle used as a high stakes exam by program directors, we will never get out of teaching to that test; and that is going to create a big, big problem.

**Goodenberger, Dallas:** Thanks, Larry. I enjoyed it. You have an enormous opportunity. You alluded to the fact that there has been an enormous growth of Caribbean medical schools over the last 15 years. It is estimated that there are about 5,000 Caribbean medical students training in clinical rotations in the United States at any given time. It is also estimated that in five years or so there will be about 10,000 third and fourth year osteopathic medical students training in clinical venues in the United States. Both of them practice the cowbird model of medical education. Cowbirds are parasites that lay their eggs in other bird's nests and kick out the other nestlings, and during that same period of time ambulatory education and allopathic medical schools has largely been pre-flexnerian. You know, in the absence of allocation of resources, we have set our kids out into the community with little in the way of faculty development, financial resources, feedback, evaluation and so on. I think there is a crisis in ambulatory education coming on, and I wish you would comment on what you are going to be using to support your ambulatory education.

**Smith, New York:** I absolutely agree! I think that our medical education technology on the inpatient wards despite the changes in the hospital, still is superior in every way to how far we have advanced in ambulatory teaching. We are building a faculty development unit before we ever have any faculty as a clear-cut statement that this has to be part of the modern medical school, and we are hoping that we will get a select group of volunteers who are willing to actually participate and teach differently than they were taught 30 and 40 years ago; and I think it will take time to see if we are successful, but we clearly recognize the problem you alluded to.

**Ludmerer, St. Louis:** Thanks, Larry. There is an enormous amount to talk about in what you presented. I wanted to pursue this issue of impediments to success. As George pointed out, there was this huge hope not only that we would have new schools but a new way of teaching medicine in that last wave, and the schools became conventional ones. I think that in addition to the LCME and the Step 1 of the examination, which are important issues, it would be very wise to take this issue into consideration, and it sounds like you are—faculty development—because the real lesson of the 35 or 40 schools was that they began with high ideals new expectations but did not have the faculty to perpetuate the ideals beyond initial phases of the institutions; and they very quickly became conventional medical schools no matter what their original aspirations had been and that the economics of medicine also facilitated that. How does the school pay for itself? Well you get NIH grants; you develop a clinical practice. So the financial forces as well worked against the faculties. I was wondering about any additional thoughts you might have on the specific barrier to developing a faculty that can be supported, nurtured and retained?

**Smith, New York:** I think the issues are very clear as you outlined them. It is going to be difficult. I think that all of the schools that move to PBL and large case-based curricula that use 10, 12, 15 faculty at a time, every time they had a teaching exercise, have quickly found that once the initial enthusiasm of the curriculum change waned, the ability to mobilize that number of faculty, year-after-year-after-year, has become extraordinarily problematic; and so one thing is a judicious use of the faculty as a resource.

Use small groups when no other methodology will do, but there are lots of other pedagogical techniques that have actively engaged learners without eating faculty by large volumes. So I think we need to be judicious, and that is one of the things we are going to go into—is look at some of the outstanding models of active case-based learning that our business schools and law schools have modeled that do not go through large numbers of the faculty the way our classic PBL models did.

**Griner, San Diego:** Do you want to comment on how you envision changing the clinical clerkships and also envision how the hospital you are affiliated with will accept this incredible loss of efficiency that will be required by your new curriculum.

**Smith, New York:** So, it's the hospital we own, and as my boss, the CEO of our health systems said, there are hospitals that are groups of friends and then there are hospital where they are owned; and nobody in our health system can walk away because they don't like us. We have actually a remarkable amount of control over resource flow compared to affiliate hospital; and that's a big, big step forward. So I think the hospitals will buy in much better if we support these changes and we have control of the budgets in all of the hospitals. Incentives really get people to move in the same direction. So I am hopeful that that will be the case, and we are going to sure try. One of our thoughts, besides the need for ambulatory teaching in all of the clerkships is that a portion of the clerkships should be in a traditional model where you are on a service that has an old name called internal medicine or surgery, but that every clerkship should have an integrated piece where you follow the patient, not the service. Where you start is at the front door of the hospital. The patient walks in the door of that hospital, and you don't lose that patient until two or three weeks after their discharge; and we want to try both an integrated and a departmental model and integrate those two into the clerkships. The other thing is tiered clerkships. Even the first year students will have serious clinical immersion experiences so that by the time they are in the thing we call "putting them with a team," we are not pulling them out for didactics. They have had enough incremental clinical exposure that they can truly join the team and be culturally immersed in what is doctoring at that level and not always pulled out as a student.