

# On Changing Curricula: Lessons Learned at Two Dissimilar Medical Schools

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## ABSTRACT

Two dissimilar U.S. medical schools—the University of Pittsburgh School of Medicine and the University of Texas Medical Branch at Galveston—changed their curricula for the first two years of medical education from ones that were lecture-dominated and departmentally run to ones that are centrally governed, multi-modal, goal-oriented, and fully integrated, with mechanisms to continue curricular change into the last two years of medical education. The change at each school was in response to national education philosophy, the recommendations of the Liaison Committee for Medical Education after the most recent site visit, and faculty's and students' concerns and interests.

The change process took place over a three- to four-year period at each school, involved students, faculty, and

administration, and utilized task forces and retreats as communication vehicles. The barriers encountered (e.g., belief by some that the curriculum needed no change; concern over loss of departments' control) and the processes employed to overcome them and to radically change the curricula (e.g., commitment of the central administration and dean to the change, involvement of all segments of the school in the change process, appointment of department chairs on task forces, and creation of a strong curriculum committee that gave authority to faculty and students) were essentially identical. The resulting curricula were also largely similar in their main characteristics, but there were notable differences, based on the goals and concerns of the two institutions.

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**S**weeping changes in the content and style of medical students' education began in the 1990s in U.S. medical schools. Emphasis on active learning instead of a passive, lecture-dominated format, central governance rather than departmentally-based courses, and early exposure to clinical medicine have all been features of this change process.

There does not exist a simple algorithm for developing curricular changes at medical schools or for guaranteeing that such changes will be accepted by the medical school

faculty as a whole. At the same time, there are important similarities in both the problems and the solutions involved in curricular change at any medical school. We have written this article to illustrate this principle by describing the curricular changes at two medical schools that are different in important ways, the University of Pittsburgh School of Medicine (UP SOM) and The University of Texas Medical Branch at Galveston (UTMB). One of us [GMB] is particularly well acquainted with the curricular change process at these schools, since he served as the dean at each school at a time when the school extensively revised the philosophy and conduct of the first two years of medical education, and set the stage for change in the last two years. For UPSOM, that period was 1986–1995; for UTMB, it was 1995–1999.

## SCHOOLS' SIMILARITIES AND DIFFERENCES

The University of Pittsburgh School of Medicine (UP SOM), founded in 1886, is a state-related private medical school in urban western Pennsylvania. It matriculates 140 students per year, of whom approximately 10% are members of under-

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represented minorities, and has a large full-time faculty, approximately 1,400, which ranks in the 90th percentile in size. A large volunteer faculty exceeding 1,000 physicians complements the full-time faculty. Approximately 40% of the school's students are from out of state. UPSOM ranks 14th in funding from the National Institutes of Health (NIH), and state support and tuition constitute only a small percentage of the school's budget.

The University of Texas Medical Branch (UTMB), founded in 1892, is a state medical school in rural southeast Texas. It is the oldest medical school in Texas and the third oldest west of the Mississippi. It matriculates 200 students per year and has a smaller faculty (896) than UPSOM does, ranking at the 68th percentile. More than 600 volunteer faculty participate, principally in community settings across rural East Texas. In recent years, UTMB has had a very diverse student body, with as many as 60 students from minority groups matriculating annually. Ninety-five percent of the students are state residents. The school ranks 44th among U.S. medical schools for NIH funding.

Each school at the time of curriculum change had a traditional, departmentally-controlled curriculum for the first two years. Both schools' curricula were predominantly lecture-based. UPSOM conducted a course in the second half of the second year, Scientific Basis of Medicine, which was

oriented to an organ-system approach; UTMB had established a "pure" problem-based learning track in the fall of 1995, which accommodated 24 matriculants per year. Entry into the UTMB Interactive Learning Track (ILT) was voluntary, with a surplus of matriculating students requesting to participate. Early exposure to clinical medicine began in 1995, one day per month, as part of a Robert Wood Johnson Generalist Initiative Program. At UPSOM, such exposure did not begin until the third year.

At the time of the most recent Liaison Committee for Medical Education (LCME) site visit (1989 for UPSOM, 1992 for UTMB), both schools received strong recommendations from the site visit team for stronger central control of the curriculum and more active learning. On the AAMC Graduation Questionnaire, students' responses to the first two years of the pre-change curriculum were significantly negative.

## PROCESSES AND TIMELINES FOR CHANGE

### University of Pittsburgh School of Medicine

In response to students' concerns about the sequence of the first-year courses, a retreat of faculty from two basic science departments, several students, and the deans was held in

### List 1

#### Ten Principles to Govern Curricular Change\*

We conclude:

- I. That the curriculum should be goal-oriented, and the teaching and evaluation system reflect the fundamental goals.
- II. That methods of instruction that foster active learning on the part of the student should be encouraged, and that an environment be created that is intellectually stimulating.
- III. That multimodal teaching and evaluation are essential, and that the students' communication skills and problem-solving skills are to be considered an important and critical aspect of both the teaching and the evaluation system.
- IV. That we should emphasize, reward, and facilitate the teaching of medical students by providing the resources that include both educational tools and educational expertise.
- V. That topics reflecting social and ethical issues and the socialization and professionalization of physicians should be "mainstreamed" to reflect their importance.
- VI. That clinical exposure should be introduced actively and as early as possible and that a return to basic sciences in the later years of the curriculum should be considered.
- VII. That we must view the first two years of the medical school experience as a whole, and that we must define the interdisciplinary core of these two years.
- VIII. That we must recognize the need for and endorse integration—recognizing that there are both varying degrees of integration possible and different levels of integration.
- IX. That we should explore a restructuring of the first two years based on a defined interdisciplinary core, recognizing that this exploration may, and perhaps should, lead us into a curriculum that is significantly changed from the present one, that is less departmentally encompassed, and that focuses on the student as a developing physician.
- X. That we should devise the means of evaluating what we, as teachers and as learners, are doing as we enter into change.

\*Statement of the participants at a faculty-student retreat in 1989, University of Pittsburgh School of Medicine.

1989. After discussing these concerns, the courses were realigned. This relatively minor but highly symbolic change encouraged the deans, change-oriented faculty, and students to convene a two-day retreat to discuss global curricular reform. That retreat also produced ten principles that would govern future curricular change (List 1). Following the second retreat, five task forces made up of students, faculty, and administrators were formed. Over the next two years, three retreats were convened and attended each time by over 100 students, faculty, alumni, department chairs, and administrators.

At a fifth retreat in the spring of 1991, faculty advocates of a problem-based learning-centered curriculum made the case for a strong emphasis on that modality. In September 1991, at a special meeting of over 200 faculty, a motion to empower a newly appointed curriculum committee to oversee the establishment and implementation of a new multimodal curriculum passed with only a single negative vote. The curriculum committee, led by the senior associate dean (SA), oversaw the course design committees in developing the curriculum along the lines put forth by the task forces. In September 1992, the entering class became the first students in the new curriculum, termed Physicians In Two Thousand (PITT). The end product was a multimodal curriculum including problem-based learning with a student-to-faculty ratio of 9:1 in small groups, an integrated basic science core in year 1, a predominantly organ-system format for the end of year 1 and for year 2, multidisciplinary course design groups, and direct patient experiences in both years 1 and 2.

#### **University of Texas Medical Branch**

In February 1996, the faculty debated the adoption of a 12-week, community-based primary care clerkship for third-year students, as part of the Generalist Physician Initiative of The Robert Wood Johnson Foundation. The majority of the faculty voted to accept the curricular changes that were required to accommodate the clerkship.

During the debate, the need for a comprehensive review of the curriculum, including the first two years, was articulated, particularly by the clinical leadership. The dean agreed to initiate a process to determine the ideal curriculum for the school. To begin, he established seven task forces and a steering committee composed of the chairs of each task force along with the dean, vice dean, the chair of the pre-change curriculum committee, and the director of the Office of Educational Development. Over 100 faculty and students served on the task forces. The steering committee met regularly, providing a forum for discussion and an update of the deliberations of each task force.

In March 1997, a retreat was held for all of the task forces, faculty, students, and administrators who were involved in the change process. Importantly, several department chairs participated very actively. Each of the task forces made its recommendations on issues ranging from modalities of instruction to rewards for teaching. The participants endorsed most the task forces' recommendations. Presentations to the faculty were conducted over the next months.

In September 1997, at a special faculty meeting attended by 198 faculty members, the faculty, by a vote of 151 to 47, empowered the New Curriculum Committee, composed of eight elected and eight appointed members, to develop a new curriculum for the school of medicine along the lines recommended by the task forces. The dean became the chair of the new curriculum committee and appointed the vice dean as vice chair.

The dean proposed course-design groups for each of the eight-week blocks, which the New Curriculum Committee approved. The course-design groups developed the goals and objectives for each block of the curriculum and presented the goals and objectives to the New Curriculum Committee for endorsement. The day-to-day implementation of the curriculum was carried out by a five-member operations group, which included the members of the Office of Educational Development.

The curriculum adopted by the New Curriculum Committee was a multimodal one featuring small-group, active learning with a student-facilitator ratio of 9:1, a greatly reduced lecture component, and an educational method in which problem-based learning predominated. A basic science core occupied the first three eight-week blocks, and an organ-system format was used for the end of the first year and all of the second year. A course, the Practice of Medicine, ran throughout the two years, one half-day a week, and encompassed areas from physical diagnosis to public health issues and medical ethics.

#### **CONFRONTING BARRIERS**

Table 1 describes several barriers to curriculum reform that were common to both schools, the processes employed to overcome these barriers, and the specific outcomes of these processes. Three major themes resonated through these barriers and processes. The first theme, described in the table's points 1, 2 and 3, was to establish the need for curricular reform,<sup>1-5</sup> to define curricular goals and objectives, and to create a method for constructing the new curriculum. A second theme, points 4 and 5, was to develop a strong central governance system having the authority to set educational policy and having an effective implementation arm to be able to continually evaluate and revise the curriculum.<sup>6</sup> The final theme, points 6, 7 and 8, encompasses the methods

**Table 1**

<b>Barriers Encountered and Processes Used to Overcome Them at Two Medical Schools*</b>		
Barriers	Processes	Outcomes
1. Challenge of establishing the need for curriculum reform. Belief by some that old curriculum needed no change.	Citation of national authorities' calls for reform, e.g., GPEP, <sup>1</sup> ACME-TRI, <sup>2</sup> LCME, <sup>4</sup> and MSOP. <sup>5</sup> Highlighting local problems, e.g., schedules, student and faculty concerns. Having retreats to examine need for reform.	Acceptance of the need for curriculum reform by both schools. Identification of leaders from the faculty, administration, and students.
2. Specific goals and objectives of the old curriculum were not explicit, therefore, hard to evaluate.	Appointment of task forces with broad-based membership. Review of students' perceptions and their responses to AAMC matriculation and graduation questionnaires.	Establishment of set of goals and objectives specific to each school. Identification of students, faculty, and administration with these goals.
3. Ill-defined method for deciding on the structure of a new curriculum.	Review of other schools' experiences and of task force reports. Identification and use of local strengths to construct each school's curriculum.	Use of ten principles (see List 1). Agreement reached in each school on a multimodal curriculum, an emphasis on active rather than passive learning, the early introduction and integration of clinical material into the curriculum, increased choice by students of their learning, and provision of unscheduled time.
4. Concerns over loss of departmental control.	Appointment of department chairs on task forces and committees. Presentations made to departments and faculty groups. Establishment of broad-based curriculum committee (CC).	In both schools, agreement on central governance; appointment of a strong CC with authority, resources, and defined reporting lines; and use of Office of Medical Education (OMEd) as CC implementation arm.
5. Faculty and departmental resistance to change, including how to evaluate effectiveness of the new curriculum.	OMEd assigned responsibility for establishing database for individual course and overall yearly evaluations. Resources and information provided to both individual faculty and departments.	Well-defined, integrated years 1 and 2. Agreement to defer significant changes in years 3 and 4, with resolution to use the same basic principles and governance structure for such change in the future. Instruments devised for course and ongoing curricular review, thereby establishing mechanism for innovation and change.
6. Expressed (and unexpressed) faculty concerns about time commitment, resource allocation, and promotion.	Establishment of teaching portfolios. Training of faculty for new teaching modalities, e.g., PBL. OMEd, and CC made responsible for scheduling courses, preparing and distributing materials, securing copyright on handouts, and training support staff in informatics.	Creation in both schools of yearly faculty evaluation process, awards for teaching, and new guidelines for faculty promotion committees. More efficient use of faculty time through use of OMEd support system.
7. How to identify and correct mistakes? How to promote innovation and continued curricular evolution?	Ongoing course and curriculum review by the CC. Reports by CC to the faculty. Meetings with students. Creating an executive management committee for the CC with strong administrative and faculty representation.	Detailed internal course review with feedback to course directors and chairs; yearly full-day education colloquium with results distributed to entire faculty and student bodies; and establishment of outcome measures for courses and curriculum.
8. Faculty concern about speed of the curriculum change.	Definite timetable for task force reports and recommendations, for draft proposal to be sent to the steering committee, and for steering committee proposal to be submitted to dean and associate (vice) dean. Review of progress by school executive committee.	Overwhelming acceptance of new curriculum by faculty at UPSOM (only one negative vote) and by strong majority at UTMB (75% in favor) at open, well-attended meetings of each school's faculty.

\*The University of Pittsburgh School of Medicine (UPSON) and The University of Texas Medical Branch at Galveston (UTMB).

**List 2****Seven Overall Outcomes of the Curricular Change Process at Two Medical Schools\*****1. Establishment of a new curriculum****2. Establishment of new administrative structures for medical education**

The faculties of the two schools voted for the establishment of a centrally controlled curriculum instead of a curriculum controlled by departments.

**3. Changes in the "culture" of each school**

Students and faculty at both schools experience a greater degree of collegiality.

Faculty regard students as adult learners.

**4. Effects on student composition, attitudes, and performance**

At UPSOM there have been overall changes reflected in improved USMLE scores, greater maturity of the matriculants, and greater selectivity for admissions.

At UTMB, with the first class halfway through the second year, it is too early to identify outcomes with confidence, particularly performance on the USMLE.

**5. Effects on alumni and community relationships**

In spite of some early concerns, the alumni have vigorously supported the new curriculum at UPSOM. At UTMB, where the first class under the new curriculum is part way through the second year, some of the alumni remain concerned about the educational program. Both schools have received a significant amount of support from the community. At UTMB, part of this support reflects the extensive community-based primary care clerkship that the students take in the third year.

**6. Defined faculty performance, evaluation, and promotion standards**

At UPSOM, teaching has become a major component in the promotion picture, with the use of teaching portfolios, student evaluations, and peer-group evaluation providing a substantial amount of the performance evaluation. At UTMB teaching portfolios and use of mission-based management have been recently initiated and faculty standards are in the formative stage.

**7. Method for ongoing curricular change and innovation**

At both schools, review of existing courses, restructuring, and evolution of the courses have led to innovation. At UPSOM a formal process of introducing curricular innovation has been instituted. Proposals submitted by faculty and students are reviewed and acted upon by the curriculum committee.

\*The University of Pittsburgh School of Medicine (UPSON) and The University of Texas Medical Branch at Galveston (UTMB).

used to deal with expressed and unexpressed faculty concerns related to recognition and rewards for teaching, faculty involvement in future curricular development, and the rationale for setting an early implementation for the new curriculum.

The overall general outcomes of the curricular change process are shown on List 2. In both schools, radically new curricula were established whose organizational structures, although quite similar, differ significantly in specific course details and emphasis. These differences reflect the different goals and cultures of the two schools. New administrative structures in both schools endorsed central governance, reduced departmental control, and defined resource/budget allocation.<sup>6</sup> The cultures of both schools changed in the direction of greater collegial relationships among students, faculty, and the administration rather than the former simple teacher–learner mentality. In the new culture, students became stakeholders in the education process. Students now have significant involvement in maintaining and developing the curriculum. There is a new emphasis on innovative educational scholarship.

The specific effects of the curricular changes on students

were dramatic in both schools, probably more so at UPSOM, which changed from a more traditional curriculum that did not have an interactive learning track, whereas UTMB did have such a track. At UPSOM, application rates rose sharply, students' satisfaction with the curriculum rose—as noted on questionnaires of the Association of American Medical Colleges (AAMC), students' success on Step 1 of the United States Medical Licensing Examination (USMLE) was maintained and in some ways improved, and the matriculation rate of applicants at UPSOM who were admitted to other Commonwealth of Pennsylvania schools increased. At both schools, the curricular changes allowed alumni to identify more closely with the students and the school and to become more involved with the education process. At both schools, however, some alumni were quite negative about the kinds of changes built into the new curricula, particularly those concerning self-directed learning. There was greater outreach to the community, with more community physicians as well as alumni becoming involved in medical school education. A number of members of both groups functioned as small-group facilitators. Indeed, community relations improved at both schools, and there was greater col-

legality between the medical school and other parts of the university. Faculty from other professional schools participated as facilitators for the medical students in the new curricula, and at UTMB, medical and nursing students shared a common course on spirituality and medical students and physician assistant students worked together in clinical problem-based learning.

As dramatic as the effect on students was the effect on faculty at both schools. For example, the new evaluation performance standards at UPSOM mandated that undergraduate education was a significant factor for evaluating faculty performance. These standards hastened the development of a system for crediting the departments and faculty for their teaching and linking this effort to resource allocation. Finally, new mechanisms for ensuring ongoing curricular change and evolution became an integral part of the two schools' curricular processes. At UPSOM, a strong curriculum committee working with the Office of Medical Education and the administration through defined reporting lines directly encouraged offerings of new course electives and alterations in standard courses. The new mechanisms empowered faculty and students to work with the administration as agents of change. Finally, the greater interactions among the faculty in the numerous course-design groups helped bridge the gap between clinical and basic science faculty. This remains one of the major changes in both schools and has been a positive influence in dealing with the problems managed care has brought to the academic health center.

### LESSONS LEARNED

As this report indicates, two dissimilar medical schools changed their teaching programs from ones that were decentralized, department-based, and lecture-dominated to ones that were goal-oriented, centrally governed, fully integrated, and multimodal, including extensive problem-based learning. We think that the striking similarities in the problems and solutions encountered at these two dissimilar medical schools in effecting radical changes in their curricula in relatively short periods of time illustrate important lessons for successful educational reform.

First, in each school, changes in national educational philosophy and policy manifested during the LCME visits combined with a commitment to change led by a central administration and dean helped awaken and focus the school concerning the necessity and utility of educational change. Without such a broad commitment, true change, as opposed to rescheduling and repackaging, could not have been accomplished.

A second lesson learned was the importance of widespread inclusion of faculty and students in the process of change.

Indeed, the process depended on buy-in by critical faculty, students, and, most important, department chairs. The critical step in each school's change was the willingness of the faculty to cede authority to a new curriculum committee before the design of the curriculum was complete. The students, as the only individuals to experience the entire curriculum, brought reality to the deliberation. It was informative to observe how the faculty often sought students' opinion and approval.

There were differences between the schools' responses to the changes. The new curriculum at UPSOM was ratified by over 99% of the faculty, while at UTMB only 75% ratified the new curriculum. The comparison may reflect the fact that at UPSOM, more time was given to developing the intellectual and political support for their curricular changes. It may also reflect a persistent negative view of the curriculum held by some faculty at UTMB based on their concern that the ongoing pilot ILT tract would become the standard. Seventy-five percent acceptance is clearly different from virtually 100%. Also, it is evident that some very respected faculty members have still not bought into the new curriculum at UTMB, even though at this writing the reforms had been in place for over a year and a half.

A third lesson was the importance of establishing central governance early in the process and of appointing a strong, empowered curriculum committee that provides authority to faculty and students and has implementation support from the Office of Medical Education. This organizational structure has provided a forum to address the concerns of faculty about loss of control, the number of faculty hours that small-group learning would consume, the training of faculty for new modalities such as problem-based learning, and, in this era of corporate medicine, specific rewards for involvement in educational activities.

### FINAL THOUGHTS

The open processes employed in the two schools resulted in remarkably similar organizational structures, but the specific curricular details, the emphases of the two curricula, and their future evolution differ based on each school's specific goals and concerns. We will continue to observe these institutions to learn more about how well they are able to maintain their new curricular goals and, more important, how well they are able to remain open to seeing and acting upon the needs for further curricular change that arise in the future.

### REFERENCES

1. Muller S (chair). Physicians for the Twenty-first Century: Report of the Project Panel on the General Professional Education of the Physician and College Preparation for Medicine. *J Med Educ.* 1984;59(11, Pt 2).

2. Educating medical students: assessing change in medical education—the road to implementation (ACME-TRI report). *Acad Med.* 1993;68(6 suppl).
3. Bloom SW. Medical education in transition: paradigm change and organizational stasis. In: Marston RQ, Jones RM (eds). *Medical Education in Transition*. Princeton, NJ: The Robert Wood Foundation, 1992:15–25.
4. Kassebaum DG, Cutler ER, Eaglen RH. On the importance and validity of medical accreditation standards. *Acad Med.* 1998;73:549–64.
5. Medical School Objectives Writing Group. Learning objectives for medical student education—guidelines for medical schools: Report I of the Medical School Objectives Project. *Acad Med.* 1999;74:13–8.
6. Reynolds CF III, Adler S, Kanter SL, Horn JP, Harvey J, Bernier GM. The undergraduate medical curriculum: centralized versus departmentalized. *Acad Med.* 1995;70:671–5.

*Cover Note*

NAPS



Napping may not be synonymous with summer afternoons but the two are certainly linked by tradition, habit, and the sheer pleasure of the practice. Of course, the same could be said for couch naps on weekend afternoons, or naps atop cool sheets in shuttered bedrooms, or grainy naps under beach umbrellas.

A few societies still have their days organized to include the siesta, that officially approved nap in the hottest part of the day. In much of the world, however, and especially in highly industrialized societies, naps are not socially acceptable. They are seen as a sign of laziness, and to admit to napping is to admit to weakness. But the reason for the strong pull of the afternoon nap lies deep in the brain—in the suprachiasmatic nuclei, a cluster of cells in the hypothalamus where the circadian clock regulates cycles of sleeping and waking. At the time approximately 12 hours from the deepest point of nighttime sleep, this regulator pushes the body to sleep again in the afternoon. A short sleep then gives energy, improves performance, and increases alertness. Even a ten-minute nap has been proven beneficial. Beyond these clearly productive virtues, however, are the well-attested pleasures of the nap, the relaxation and sense of “time out.”

Sleeping and waking are naturally linked to daylight. Industrialization, however, has pushed back the night, with electric light making the 24-hour day not only possible but now common, and with jet travel mixing day and night. Night shifts, midnight supermarkets, late-night TV, and all the rest of well-lighted life has shrunk the time that people sleep. The result may be that most adults now get less sleep than they need, and some sleep so little that they are a danger to themselves and others at work and driving their cars. Some organizations, such as those responsible for airline pilots, police officers, and health professionals, have begun to take naps seriously—either because the naps may be a sign that their employees are sleep-deprived, or because they may improve the well-being and performance of even the rested. While officially approved naps at the office desk or in the new “nap rooms” may not reproduce the pleasure of drifting off in a hammock in the back yard, the restorative effect can be just as great.

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