The AAMC Project on the Clinical Education of Medical Students

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Introduction

In recent years, advances in knowledge in the biomedical sciences and in the development of technologies applicable to medicine have occurred at an unprecedented rate. During the same period, there also have been extraordinary changes in the ways that medical care is organized and delivered, and in society’s expectations of medicine. As a result of all of these changes, the knowledge, skills, and attitudes that doctors will need to provide high quality medical care in the 21st Century are different from those that have been needed in the past. It follows, therefore, that these changes have important implications for the ways in which doctors are educated.

The formal education of doctors occurs in two distinct phases. The purpose of the medical school experience is to allow future physicians to begin to acquire the knowledge, skills, and attitudes that they ultimately will need for medical practice. The purpose of the residency experience is to allow medical school graduates to build on the foundation established in medical school so that they become competent to enter practice in one of the specialties or subspecialties of medicine.

During the past quarter century, the clinical faculty of medical schools have become more directly involved in the care of patients admitted to teaching hospitals. As a result, they have increasingly focused their attention on the education of resident physicians who assist them in the care of their patients, and have been less attentive to the clinical education of medical students. However, the education of medical students is the sine qua non of a medical school, and the quality of the medical student education program is critically important to ensuring that medical students will acquire the knowledge, skills, and attitudes that they need to construct a strong foundation for lifelong learning. Thus, the primary responsibility of the clinical faculty must be to ensure the quality of the clinical education of medical students.

During the past few years, the Association of American Medical Colleges (AAMC) has been committed to stimulating changes in medical education to create a better alignment of educational content and goals with evolving societal needs, practice patterns, and scientific developments. In pursuit of this strategic commitment, the Association has embarked on a number of programmatic activities designed to assist medical schools in their efforts to reform their curricula, and to improve the pedagogical approaches being used to promote student learning. In the course of pursuing these objectives, the Association became increasingly aware of apparent deficiencies in the design, content, and conduct of the clinical education of medical students.

In order to begin to address this concern, the Association embarked on a project that was designed to define the state of medical students’ clinical education. This report describes the design of that project, and presents a number of observations of, and conclusions about, the current state of medical students’ clinical education. The report begins with background information about the evolution of the clinical education of medical students in the United States in order to provide a context for understanding the rationale for the project and for interpreting the project’s findings.
Background

Until late in the 19th century, medical schools in the United States, with few exceptions, included no formal instruction in clinical medicine in their curricula. In general, medical school graduates would learn clinical medicine (such as there was to learn) once they had entered independent practice, or by apprenticing themselves to community practitioners. Graduates who desired formal instruction in clinical medicine would spend a period of time studying in Europe where medical education was more advanced, or they would find a “house officer” position at a hospital in the states where they could learn under the watchful, albeit somewhat distant, eyes of local practitioners.

The opening of the Johns Hopkins Hospital in 1893 is generally considered the sentinel event that established clinical instruction as a necessary and required component of the formal education of medical students. Indeed, the approach to clinical instruction, which Sir William Osler established at Johns Hopkins, became the model that was adopted by other medical schools as they began to include formal instruction in clinical medicine in their curricula. Osler believed that third year students should receive formal instruction in clinical medicine by attending clinical demonstrations conducted in the clinic and amphitheater. He believed that fourth year students should learn clinical medicine by being assigned responsibility for the care of a certain number of patients on the hospital wards, rotating every few months from one clinical service to another to gain experience in different clinical disciplines.

The basic structure of the medical school curriculum had become reasonably standard by the end of the 1920s. In most schools, the first two years were composed of a number of discipline specific, departmentally administered basic science courses. The last two years were composed of required clinical clerkships in internal medicine, surgery, obstetrics/gynecology, pediatrics, and ultimately psychiatry, and elective rotations in a variety of clinical disciplines.

In the 1950s, the organization of the educational program began to change. For example, some schools began to experiment with new approaches for organizing the material taught in the first two years of the curriculum. Rather than teaching the basic sciences in individual, discipline-specific courses, they taught relevant material drawn from each of the sciences in units organized around individual body organs or systems. In virtually all schools, the clinical clerkships were moved from the fourth year of the curriculum (the Osler model) to the third year, and the fourth year became devoted to rotations in hospital clinics and on inpatient services devoted to clinical disciplines not represented in the required clerkships. Over time, schools set aside much of the fourth year for elective experiences, so that students could gain experience in clinical disciplines of particular interest to them.

Throughout most of the 20th Century, the focus of the clinical education of medical students remained on the care of seriously ill, hospitalized patients, even though most practicing physicians spent the majority of their time caring for ambulatory patients. In virtually all cases, the educational design of the clerkship and elective experiences consisted solely of assigning students to teams composed of resident physicians and an attending physician. This approach was governed largely by the notion that students would learn what they needed to know by assigning them to inpatient services where they could learn by observing resident physicians and attending physicians in action, and by doing whatever they were asked to do.

From an educational perspective, this design concept was highly flawed, primarily because the clerkship experiences, even in the individual clinical disciplines, were highly variable. The variability was inevitable, because of the varied nature of the clinical sites to which the students were assigned over the course of any given year, the variable spectrum of the conditions encountered at those sites, and the variable quality of the supervision and teaching provided by resident physicians and attending physicians at those sites. As a result, it
was not possible for medical schools to ensure that all students were having comparable educational experiences during the last two years of the curriculum.

In the early 1980s, the Association of American Medical Colleges established a blue ribbon panel to review the education of physicians in the United States (General Professional Education of Physicians and College Preparation for Medicine). In 1984, the panel (GPEP Panel) issued its final report, *Physicians for the Twenty-First Century*, and the reports of a number of working groups that had been established to inform the panel’s deliberations. The panel’s Working Group on Fundamental Skills was particularly critical of the clinical education of medical students. The working group noted that the clinical clerkships were often little more than unstructured apprenticeship experiences that contributed little to the overall learning objectives of the educational program, and questioned the value of a largely elective fourth year. Based on these observations, the panel recommended that a comprehensive review of the clinical education of medical students be conducted, with particular emphasis on the clerkship experiences.

A seminar sponsored by the Macy Foundation in 1988 reinforced these observations and concluded that the clinical education of medical students had not kept pace with changes in American medicine and the society it serves. In the same year, a former Harvard Medical School dean and a distinguished health economist authored a paper in which they recommended elimination of the fourth year of medical school, because it offered little to the education of medical students.

In 1992, a commission sponsored by the Robert Wood Johnson Foundation recommended that the entire curriculum, to include the clinical years, needed to be redesigned to provide greater emphasis on the social and behavioral sciences, clinical epidemiology, and medical informatics. Subsequently, others recommended that the curriculum also needed to accommodate new knowledge about genomics, and the interaction of genes and the environment in determining the health of individuals and the community.

A project conducted by the AAMC in the early 1990s (Assessing Change in Medical Education – the Road to Implementation) determined that few schools had responded to the recommendations set forth by GPEP and the other panels that had reviewed the state of medical students’ education. However, as the decade progressed, many medical schools did begin to make changes in their curricula. These efforts were catalyzed in part by curriculum reform grant programs sponsored by the Robert Wood Johnson Foundation and the federal government’s Bureau of Health Professions. A limited number of schools were awarded grant funds to support curriculum reform activities consistent with the projects’ goals. However, the availability of grant funds prompted many schools to examine their curricula in order to determine if their educational programs were designed to provide a high quality education for their students.

In the late 1990s, the AAMC Medical School Objectives Project (MSOP) set forth guidelines that schools could use in designing their educational programs. The Association also conducted several projects that were designed to gain insight into the scope of the curriculum changes being adopted and implemented in U.S. medical schools. The results of those projects indicated that while there were dramatic changes occurring in the curricula of many medical schools, those changes were largely limited to the first two years of the educational program. Indeed, schools that were making, or had already made, major changes in their curricula reported that it had been difficult, if not impossible, to implement any changes in the third and fourth years despite compelling reasons for doing so.

Given these observations, and being deeply concerned about the impact on medical education of the dramatic changes that have occurred in recent years in the patient care environments in which clinical medicine is practiced and taught, the Association felt compelled to undertake the project described in this report.
Project Goals and Objectives

The primary goals of the AAMC Project on the Clinical Education of Medical Students are to conduct a comprehensive review of the clinical education of medical students and to affect changes in the design and conduct of the clinical curriculum, which will improve the quality of medical students' education. The specific objectives of the project are:

**Phase I**
- To define the organization, structure, content, and conduct of the clinical curriculum (primarily the third and fourth years of medical school)
- To identify examples of innovations being implemented in the design and conduct of the clinical curriculum
- To identify issues of concern related to the clinical education of medical students

**Phase II**
- To disseminate information about the state of the clinical curriculum
- To promote a national dialogue on the kinds of changes needed to improve the clinical education of medical students
- To assist individual medical schools in their efforts to improve the quality of the clinical education of their students

Project Activities

**Phase I**

In order to achieve the Phase I objectives outlined above, the co-directors of the project conducted the following activities:

- Conducted a comprehensive review of the literature dealing with issues relevant to the clinical education of medical students and clinical educators
- Analyzed information relevant to the clinical education of medical students contained in a number of AAMC databases and reports
- Conducted site visits to seventeen U.S. medical schools for the purpose of interviewing education deans and staff, clerkship directors, and senior medical students
- Conducted similar site visits to two Canadian medical schools
- Collected information on the clinical curriculum from three additional U.S. schools that were site visited primarily for other educational purposes
- Conducted an Internet query of the undergraduate education deans of U.S. medical schools to elicit information about efforts underway to implement innovations in the clinical curriculum
- Conducted structured telephone interviews with the education deans of nine schools to collect detailed information about innovations of special interest

The onset of Phase II activities overlapped to some degree the conduct of Phase I activities. Since Phase II of the project is ongoing, those activities will be described in a subsequent report.
Project Observations

The observations set forth in this section of the report are based on a synthesis of all of the information available to the project co-directors upon completion of the Phase I activities outlined above. Needless to say, the observations reported, and the conclusions drawn from those observations, do not necessarily apply to every school in the country. However, because the schools that were site visited are, as a group, reasonably representative of the diversity and geographic distribution of all U.S. medical schools, it is reasonable to assume that the conclusions reached by generalizing from the observations made during those visits are valid.

The Clinical Curriculum: Organization and Structure

As a result of changes that have occurred during the past decade, the clinical curriculum is no longer limited to the last two years of the educational program. In the great majority of medical schools, clinical content has been integrated into the basic science course work offered during the first two years of the educational program. In addition, many schools offer courses in the first two years that focus on various aspects of the doctor-patient relationship, with specific emphasis on taking a history, performing a physical examination, and communicating with patients and patients’ families. Finally, in a number of schools, clinical experiences, generally in the form of community-based preceptorship experiences, often begin in the early months of year one and continue throughout the first two years. However, since the clinical education of students is concentrated in the third and fourth years of the curriculum, the focus of the project, and of this report, is on the educational experiences provided during those years.

The required clinical clerkships in the major disciplines (family medicine, internal medicine, obstetrics and gynecology, pediatrics, psychiatry, and surgery) generally occupy the entire third year of the curriculum. In a limited number of schools, the clerkship rotations begin during the second half of year two. In most schools, the required clerkships must be taken in sequence, and must be completed before students can take elective rotations. Some schools allow students to defer one or more of the required clerkships until year four, although this is becoming less frequent as schools add more requirements to the fourth year. Very few schools currently allow students to schedule elective time in year three. However, this may become more frequent if, as seems to be the case, more schools decide to begin the clinical clerkships during the latter half of year two.

During the past decade, some schools have changed the organization of the third year by creating block rotations. Each of the blocks is composed of several clerkships that students must take in sequence within the block period. More than half of the schools that were site visited have adopted this structure. The block structure has been adopted primarily as a means of promoting integration of clinically relevant content across related disciplines (e.g. psychiatry and neurology, pediatrics and obstetrics/gynecology, family medicine and general internal medicine). Several schools have established interdisciplinary ambulatory care clerkship blocks that run for three to six months during the third year. In those schools, the discipline-specific, departmental orientation of individual clerkships has been largely eliminated.

As a general rule, the required clinical clerkships, with the exception of family medicine, continue to utilize inpatient services as the primary venue for the clerkship experiences. However, the amount of time devoted to ambulatory care-based experiences is substantial in pediatrics, and in obstetrics and gynecology. Internal medicine clerkships may offer a block of ambulatory care-based experience, or schedule students to rotate through one or more clinics on a half-day basis while being assigned to an inpatient service. The amount of ambulatory care-based experience in surgery and psychiatry is extremely variable, but tends to be less than in the other disciplines. In some schools, students also attend continuity clinic experiences.
in year three, which are conducted independent of any of the required clerkships. In the schools that were site visited, approximately 25 percent of the time allocated for required clerkships is devoted to ambulatory experiences.

The organization of the ambulatory experiences was quite variable in the schools that were site visited. As noted above, several of the schools had created multidisciplinary ambulatory clerkships of three to six months duration. Other schools had combined several discipline-specific ambulatory experiences into a single block, thus disassociating the inpatient and ambulatory components of a single clerkship. In some schools, this approach, by fragmenting a discipline-specific experience into two components that were not juxtaposed, seemed to undermine the integrity of the educational experience and, therefore, was not viewed favorably by faculty and students. In other schools, the approach seemed to be working well.

In order to accommodate current class sizes, virtually all schools use multiple clinical venues to provide clerkship experiences for students rotating through a clerkship during any given period of time. The 125 medical schools use more than 800 hospitals as inpatient sites for one or more of the required clinical clerkships. In many cases, the hospitals that serve as clerkship sites are quite distant from the medical school. Indeed, it is not uncommon for a clerkship site to be located in a different city, or even in a different state. The hospitals that are used by a given medical school for a single clerkship may have quite different patient populations, may sponsor different residency programs that are of variable quality, and the relationships of the clinical faculty to the medical school also may be quite variable. Each of these factors complicates the ability of the medical school to ensure to a reasonable degree that during a single clerkship, all students are having comparable educational experiences. In fact, many schools recognize that this is not the case.

The fourth year of the curriculum is highly variable, although in most schools the majority of the fourth year is available for students to elect rotations of interest. It is quite common for fourth year students to take elective rotations at sites that are not directly affiliated with their medical school, including sites out of the country. For practical purposes, the medical school faculty has no involvement in any of those experiences. However, there does appear to be a trend underway to limit the number of electives that can be taken at sites that are not directly affiliated with the medical school, and the number that can be taken in a single specialty.

There also is a trend in progress for schools to increase the amount of time in year four devoted to meeting specific course requirements. Many schools now require a neurology clerkship, and almost two-thirds require one or more sub-internship experiences. Some schools also require ambulatory care, radiology, emergency medicine, critical care medicine, or surgical subspecialty experiences. On average, schools now have course requirements that occupy 14 weeks of the fourth year of the curriculum. Nonetheless, some schools have no specific course requirements in the fourth year, and few schools have organized the fourth year to ensure that it contributes in a coherent way to the general professional education of their students.

Most medical schools recognize the need to devote time in the third and fourth years to cover topics related to contemporary issues in medicine, which do not necessarily fall in the purview of a single clinical discipline. End of life care, the principles of population health, nutrition, and bio-medical ethics are several examples of the kinds of topics involved. Schools face a formidable challenge in trying to integrate these topics into the clinical curriculum, primarily because the third and fourth years are organized as a series of discipline-specific clinical experiences.

In an attempt to cover these topics, schools are beginning to utilize a number of different strategies. As mentioned above, some schools have organized the third year of the curriculum into several blocks, each block consisting of several clerkships. In
some of those schools, the topics of interest may be assigned to different blocks, with the faculty of the disciplines within the blocks responsible for integrating the material into existing learning exercises (lectures, seminars, etc). In other schools, a regular time is scheduled each week, or every other week, when all students break away from clerkship responsibilities to attend learning exercises where the content is covered. These breakout sessions are often several hours in length. Regardless of which of the strategies are employed, schools have had variable success in meeting the desired objective.

The inter-session model is a particularly innovative approach being used by some schools for covering this material. This model entails scheduling several days between blocks or clerkships (inter-sessions) to cover the material in various classroom or small group learning exercises. Almost one-half of the schools that were site visited had implemented, or were in the process of implementing, the inter-session model. Finally, some schools that have been unable to integrate the material into the third year attempt to cover the topics of interest by offering a series of seminars or capstone courses in year four. Once again, the success of these approaches is quite variable.

The Clinical Curriculum: Management and Oversight

In general, the responsibility for the management and oversight of the clinical curriculum as a whole is shared between the dean’s office (administration) and the school’s curriculum committee (faculty governance). Traditionally, the responsibility for the design and conduct of the clerkships has been delegated almost entirely to the individual clinical departments. This situation is responsible to a great extent for the difficulty that schools have experienced in attempting to reform the clinical curriculum, particularly in integrating content across clerkships, and to improving teaching methods.

Recognizing the need to reform the clinical curriculum, many schools have taken steps to centralize in the dean’s office the management and oversight of the curriculum. These efforts have met with variable degrees of success, but some degree of centralization has occurred in most schools. As a result, the senior member of the dean’s staff (associate dean or vice dean), who is responsible for the medical student education program, is assuming a more prominent role in managing, and providing oversight of, the clinical curriculum.

However, on a day-to-day basis, the individual clerkship directors have responsibility for the management of their clerkships. These individuals have an extremely important role to play in the schools’ efforts to improve the quality of the clinical education of their students. Despite the key role played by clerkship directors, they are with few exceptions appointed to those positions by department chairmen without being subject to approval by the dean’s office. In this regard, it should be noted that many clerkship directors are very junior members of the faculty who have had little, if any, administrative experience and no formal training in educational theory and practice. Furthermore, it appears that they often receive little material support from their department chairs. Despite the circumstances within which they function, the clerkship directors are generally highly motivated, enthusiastic, and committed to overcoming the challenges they face.

In a few medical schools, clerkship directors either are appointed by the dean, or their appointment is subject to approval by the dean. In most schools, clerkship directors have an informal reporting relationship to the “education dean,” who often convenes regular meetings of the clerkship directors as a group to discuss and resolve issues common to the clerkships. In addition, a growing number of schools are beginning to offer structured educational programs that provide opportunities for clerkship directors (and other faculty, as well) to become more knowledgeable about medical education theory and practice, and the issues facing academic institutions.

Clerkship directors face a number of extraordinary challenges. One of the most challenging is to pro-
vide, to the degree possible, comparable educational experiences for students rotating through the clerkship at multiple and, at times quite distant, sites. In an effort to meet this challenge, some clerkship directors hold annual or biannual meetings with the clerkship coordinators from the various sites to address issues of educational quality. In the same vein, clerkship directors are beginning to use the Internet to provide a common set of resources for small group, case-base learning exercises for students assigned to different sites. In addition, clerkship directors are, on occasion, using teleconferencing, to provide a common set of didactic presentations to those students. Nevertheless, schools have not yet committed the resources that are required to allow clerkship directors to take full advantage of information technology applications in managing, and providing educational materials for, their increasingly distributed clinical education experiences.

It is important to note that as a general rule, the chairmen of clinical departments are uninvolved in the clinical education of medical students. Over the years, the role of the clinical department chair has evolved to include a major responsibility for the clinical practice activities of the faculty. As this has occurred, the chairman has delegated responsibility for the day to day management of both resident physicians’ and medical students’ education to members of the faculty (program directors and clerkship directors). Although chairmen often remain quite active in resident physicians’ education, particularly the chairs of smaller departments, many have only sporadic contact with medical students. As a result, the faculty of many departments, seeing that the medical student education program is not a high priority for the chairman, are uncertain about the degree to which they should agree to participate in teaching activities when requested to do so by the clerkship directors.

The Clinical Curriculum: The Education Program
The purpose of the medical student education program is to provide opportunities for medical students to acquire a solid foundation in the knowledge, skills, attitudes, and behaviors that they will ultimately need for the practice of medicine. In pursuit of this goal, they must achieve a level of mastery that will allow them to assume the responsibilities they will be expected to meet as entry-level resident physicians. In keeping with these goals, the clinical curriculum must be viewed as an integral component of the entire four-year educational program, and each of the clinical rotations that compose the clinical curriculum must serve the overall educational objectives of the program as a whole. Thus, each required and elective clerkship experience must have well-articulated learning objectives that are consistent with the overall program objectives, the experiences must be designed and conducted so that students can achieve the stated objectives, and students’ performances during each experience must be assessed against those objectives.

Unfortunately, it does not appear that these educational principles are being followed in the majority of medical schools. In most schools, clerkship learning objectives that are quite appropriate for medical students’ education do exist. Often, these learning objectives reflect guidelines developed by the national clerkship directors’ organizations to assist individual clerkship directors in developing learning objectives that are consistent with the overall program objectives, the experiences must be designed and conducted so that students can achieve the stated objectives, and students’ performances during each experience must be assessed against those objectives.

As noted above, medical schools must use multiple and varied patient care sites to provide students with clinical experiences during each of the required clerkships. Despite this, students may not have an adequate experience in having first contact with patients whom they are able to follow throughout their hospitalization. In some cases, the patient populations that students are exposed to are not optimal for medical students’ education. This is more often a problem in major academic medical centers where patients may have very
complex, highly specialized problems, and may be critically ill. Similarly, the clinical faculty who provide care in those institutions – generally the full-time medical school faculty – may have organized their clinical services in such a way that they do not provide opportunities for students to be exposed to a wide range of clinical problems. Finally, because many patients who formerly would have been cared for in the hospital now receive their care in ambulatory-care settings, the number of patients on inpatient services may be inadequate. As a result, a number of schools have found that they must rely on community hospitals and practice sites to provide students with adequate first contact experiences with patients who have a suitable array of common problems.

In considering these issues, it is important to recognize that the degree to which they are problems is somewhat discipline specific. For example, it is extremely difficult, if not impossible, to provide students with a general surgery experience on an inpatient service of a major academic medical center. One of the major reasons for this is that most of the routine surgical cases that provide appropriate learning experiences for medical students are now managed as outpatients, and the surgery is conducted in ambulatory surgery centers. In addition, the inpatient surgical services in major academic medical centers are highly organ specific. General surgery services have been replaced by, for example, thyroid, breast, and GI services. Thus a medical student might spend an entire month seeing only breast cases.

Medical students’ experiences in psychiatry have been affected also by changes in the practice of psychiatry. Due to the remarkable advances in drug therapy and changing practice patterns, psychiatrists do not manage most of the common psychiatric disorders that medical students should see. In conjunction with this, hospital stays have become much shorter for those psychiatric patients still admitted to an inpatient service, thus decreasing the number of inpatients and limiting students’ exposure even to hospitalized patients. As a result of these changes, many psychiatry departments are quite challenged to provide adequate patient experiences for the students rotating through the clerkship.

In most schools, there is inadequate attention paid to ensuring that students acquire fundamental clinical skills, particularly physical diagnosis skills. This deficiency is due primarily to the failure of the clinical faculty to focus their efforts on “bedside teaching.” An extremely important element of this deficiency is the failure of faculty to assess students’ performances adequately and to provide them with timely feedback (formative, as opposed to the summative assessment that is used for grading purposes). Contributing to the problem is the failure of most schools to take advantage of new technologies by establishing patient simulator and clinical skills facilities.

Most medical schools are developing well-organized approaches for conducting summative assessment of students’ performances at various times in the course of the clinical curriculum. During the past decade, there has been a substantial increase in the use of standardized patients for this purpose, not only for comprehensive examination purposes at specific points in the curriculum, but also for end of clerkship examinations. In addition, the great majority of schools use National Board of Medical Examiners subject examinations and observed history taking and physical examination performance, to determine students’ grades. However, the failure of faculty to provide formative assessment during the clerkships was the main complaint that senior students had about their clinical education at every school that was site visited. In keeping with this, over a quarter of all of the medical students who completed the AAMC Graduation Questionnaire indicated that faculty observation of their history taking and physical examination skills was inadequate.

Given the changes occurring in the organization and delivery of health care, and the changing expectations of patients and their families, medical students must now be exposed to a wide range of topics that fall outside of the purview of any single
clinical discipline. Too many students report that their exposure to topics such as clinical epidemiology, population health, nutrition, geriatrics, end of life care, medical care quality, and cultural competence was inadequate. To a very great extent, this situation exists because the design and conduct of the clerkships continue to be viewed as being within the purview of individual clinical departments. There has been a reluctance to centralize the management of the clerkships in the dean’s office, despite the fact that the leadership of the departments, and many faculty, do not assign an appropriate priority to the education of medical students.

Having noted these serious shortcomings in the clinical education of medical students, it is important to make clear that many medical schools recognize the deficiencies in their educational programs, and some are beginning to take steps to remedy them. On the last LCME Annual Survey, over forty percent of the schools indicated that they had begun a major clinical education reform initiative. For example, as noted previously, many schools have increased significantly the amount of time that students spend in ambulatory care experiences during the required clerkships. In addition, some schools are making fundamental changes in the organization and structure of the third year, primarily for the purpose of creating a means for integrating into the clinical curriculum topics related to contemporary issues in medicine. At present, it is not possible to determine which of the several approaches that are being tested will be most effective.

Schools also are beginning to reorganize the fourth year of the curriculum. There appears to be a growing trend for schools to establish more specific requirements that students must complete during year four. Paradoxically, students are not in favor of schools establishing more fourth year requirements, but once they are established, they highly value the experiences that they have been required to complete. The reason for this favorable outcome appears to be due to the fact that schools have been careful in adding requirements that clearly contribute to the students’ education. The introduction of sub-internships, emergency medicine, and critical care medicine have been viewed favorably, because they provide valuable experiences that provide students’ with confidence about their preparedness for residency training.

Nonetheless, the majority of time in the fourth year remains allocated for elective experiences, and it seems clear that schools still do not manage this elective time well. On the annual AAMC Medical School Graduation Questionnaire, over 25 percent of the students responding reported that they had not received adequate faculty guidance in selecting their fourth year electives. Although this is beginning to change, schools in general do not organize the fourth year course work to provide a coherent educational experience for students who wish to pursue a particular career path. In addition, few schools provide any meaningful quality control over the electives that are offered.

It should be noted, however, that a few schools have begun to think seriously about a fundamental redesign of the clinical clerkships that compose the clinical curriculum. Given the fundamental changes that have occurred in the practice of the core clinical disciplines, and the remarkable changes that have occurred in the patient care environments where medicine is practiced and clinical learning occurs, it is surprising that more attention has not been paid to this issue. It seems almost axiomatic that the design of the clerkship experience that became established a half century ago would no longer suffice as an optimal approach for medical students’ education. At issue, of course, is how the clinical experiences should be redesigned to serve better the educational needs of medical students. This issue will be explored in some detail in Phase II of this project.

Perhaps the most important activities currently underway for improving the quality of the educational program relate to changes being made in the ways that faculty who are most involved in the program are recognized and supported for their efforts. Several medical schools have established “centers” or “institutes” for medical education.
These administrative units provide a framework for recognizing and supporting faculty who hold key education roles, and for supporting the management of the educational program. Many more schools are beginning to clearly identify and dedicate funds for distribution to individual faculty or to departments to support educational activities, and are establishing special programs to recognize faculty who make major contributions to the program.

These kinds of programs tend to occur in concert with administrative and governance changes that are intended to centralize the management of the educational program in the dean’s office. These changes tend to grant to the school’s education dean more authority to manage the entire educational program, while decreasing the autonomy of individual departments to design and conduct to their liking whatever educational experience they offer in the curriculum. An important manifestation of these changes is reflected in the composition of curriculum committees. Unlike the past when departments had roughly equal representation on those committees, deans are now freer to appoint individuals who are committed to the improving the quality of the program as a whole.

The Clinical Curriculum: The Teachers

The primary responsibility for the clinical education of medical students rests with the full-time faculty of the medical schools’ clinical departments. In the 2000-2001 academic year, US medical schools reported a total of 85,902 full-time faculty in their clinical departments. Since the schools had only 16,561 third-year students, medical schools had, on average, 5.2 clinical faculty members for every medical student rotating through the required clerkships. Clearly, the ratio of full time clinical faculty to students rotating through clerkship experiences must be adjusted to take into consideration the size of specific departments, and the fact that many students are rotating at sites for which the full time faculty are not responsible. Regardless of the actual number, it is clear that the number of full-time clinical faculty far exceed the number required to provide a high-quality clinical curriculum.

There are presently frequent claims from many sources that full-time clinical faculty members do not have time to teach. These claims seem to relate primarily to the widespread perception that many faculty are unwilling to accept invitations to take on a particular teaching assignment, or to devote special time to students when they are serving as an attending physician on an inpatient service or in a clinic. This perception has its roots in the assumption that faculty are hesitant to accept those teaching responsibilities because of the demands placed on their time to conduct research or to provide patient care.

Based on the interviews that were conducted during the school site visits, it is apparent that this perception is inaccurate. Most of the clerkship directors that were interviewed stated that they were able to recruit a sufficient number of qualified faculty to participate in the educational program. Similarly, the medical students that were interviewed reported that they were generally quite satisfied with the amount of time that attending physicians spent with them. In both cases, there was a sense that faculty were willing to commit the time required because many of them enjoy teaching, and decided to pursue an academic career, at least in part, so that they would have opportunities to mentor and teach students.

Nonetheless, students and clerkship directors do sense that many faculty are stressed by the demands of providing patient care services, and of completing the paper work required to document their involvement in those services. In some cases these demands have resulted in faculty taking shorter stints as an attending physician. This is particularly the case on internal medicine services, where the traditional one-month attending rotation is being replaced in many institutions by two-week rotations. If the attending physician is also serving as the preceptor for the medical students assigned to the service, this practice is very disruptive to the educational program, since the period is too short for the development of an effective student-teacher relationship. A few internal medicine departments have begun to employ full-time “hos-
hospitalists” as a means of improving the efficiency of patient care. Although the experience is limited to date, it appears that this approach enhances the quality of the students’ educational experiences, since hospitalists are frequently on the units and available to interact with students.

As noted previously, members of the clinical faculty often believe that teaching medical students has a fairly low priority both in their department and in the school. Since deans, department chairmen, and promotion committees often do not give appropriate recognition to faculty efforts and contributions in education, they also believe that their teaching efforts are not highly valued. Indeed, the role of teaching in promotion often has not been made clear to clinical faculty. It is clear that academic leaders must do a better job demonstrating to their faculties that teaching medical students is valued and rewarded, if they hope to improve the quality of their educational program.

Schools are becoming increasingly aware that they must provide more resources to assist faculty in their efforts to develop teaching skills, and to become medical educators. During the past decade many schools have established structured faculty development programs that provide opportunities for faculty to improve their teaching and evaluation skills, and to engage in leadership training exercises. In a number of schools, faculty who wish to pursue careers as medical educators can obtain fellowship support from the dean’s office to allow them to conduct a scholarly project. A few schools are establishing, or have established, programs, centers or institutes for the recognition and support of dedicated medical education scholars.

In this regard, it is important to note that many faculty, particularly more junior faculty in clinical departments, are quite confused about the appointment and promotion policies of their schools. During the past two decades, many schools developed multiple “tracks” within the full-time faculty system. For the most part, the tracks were developed to serve the needs of the clinical departments for faculty who would spend most of their time engaged in patient care and, thus, would be unable to accomplish the scholarly work, generally biomedical research, required for promotion and/or tenure. Faculty members appointed to those “clinical tracks” are required to commit the majority of their time to providing patient care, and the balance of their time to teaching. While they frequently are not eligible for tenure per se, they may be promoted and remain on the faculty for extended periods.

In some schools, the development of these tracks has had a perverse effect. They have contributed to the demeaning of the core education mission of the school by assigning major teaching responsibilities to junior faculty who have a difficult time being promoted, and who can not be tenured, and relieving senior faculty of teaching responsibilities. Faculty who are appointed to a clinical track are largely funded by clinical revenues. Thus, they often face an inherent conflict in attempting to meet both their patient care and their teaching responsibilities. A number of the clerkship directors interviewed during the site visits had an appointment in a clinical track and, despite the key role they played in their department’s and the school’s education program, received no support for their education related activities, and were uncertain about the likelihood of being promoted.

Resident physicians are an important group of clinical teachers. In fact, resident physicians seem to be expected to participate in medical students’ education even more now than in the past. Recognizing their critical role as teachers, a number of medical schools and residency programs are beginning to provide opportunities for residents to improve their teaching skills. These activities are occurring at a time when the clinical demands on residents are increasing. Given the competing demands on their time, it is difficult to get resident physicians to take advantage of these programs. Accordingly, medical schools are beginning to recognize that teaching resident physicians to be teachers should begin in medical school. This is being accomplished by providing opportunities for senior students to learn teaching skills, and to gain teaching experience by having them tutor more...
junior students who are learning clinical skills or serve as co-facilitators for case-based learning exercises. Senior medical students almost uniformly enjoy these experiences and find them to be of value. In a few schools, senior students are required to participate in these kinds of experiences.

Finally, in the 2000-2001 academic year, medical schools reported having a total of 137,353 volunteer clinical faculty. Without doubt, many of these faculty members make little if any contribution to the medical student education program. However, many play very important roles in the clinical education of medical students, either by serving as community-based preceptors for students who spend time at their practice locations or by serving as teaching attendings for students rotating through required or elective clerkships at sites where full-time faculty are not based.

Some schools report that it is becoming more difficult to recruit or retain volunteer faculty to serve as clinical teachers for students. This is particularly true for volunteer faculty who serve as preceptors for students who spend time in their practices. In some cases, this is due to the decrease in efficiency that occurs when a student is involved in office-based practice. In other cases, the difficulty can be traced to competition for preceptors from other medical schools, or from competition with other clinical education programs within the same institution. Most medical schools provide some sort of recognition and benefits to those physicians who serve as preceptors. Less than half of the schools provide monetary payment to some or all of their clinical preceptors.

Conclusion

Phase I of the AAMC Project on the Clinical Education of Medical Students was designed primarily to document the state of medical students’ clinical education in the United States. The observations made during the conduct of the Phase I have revealed a number of major issues of concern regarding the quality of the students’ educational experiences. The major concerns include:

- The lack of awareness by the clinical faculty of the specific learning objectives established for the clerkship experiences
- The lack of adequate teaching of fundamental clinical skills, including rigorously conducted formative assessment of students’ performances
- The lack of appropriate patient populations for medical student experiences, particularly in certain disciplines
- The lack of adequate integration into the third and fourth year clinical experiences of learning exercises that focus on a number of topics related to contemporary issues in medicine
- The lack of attention to creating educational coherence in the design and conduct of the fourth year of the educational program
- The lack of support for career development and advancement of clinical educators
- The lack of explicit funding of faculty contributions to the educational program
- The lack of attention to the teaching skills of resident physicians
- The lack of adequate attention to the education of medical students by department chairmen
- The lack of adequate centralized oversight and management of medical students’ clinical education

If medical school deans and faculties hope to improve the quality of the clinical education of their medical students, they must address those issues in their own institutions. In doing so, they must be certain to align the design and conduct of the clerkship experiences, and the assessment of students’ performances, with well-articulated learning objectives. In order to accomplish this important goal, there are five major actions that they should consider taking.
First, they must ensure to the degree possible that the clerkships are designed and conducted so that above all else students acquire the fundamental clinical skills that they will need throughout their professional careers.

Second, they must ensure that the clinical experiences provided during individual clerkships expose all students to an adequate number of patients who are afflicted with the common disorders that are representative of those seen in the clinical practice of the relevant discipline.

Third, they must ensure that topics related to contemporary issues in medicine, many of which are introduced during the first two years of the curriculum, are integrated throughout the third and fourth years of the curriculum in ways that emphasize the importance of the topics to clinical medicine.

Fourth, they must establish policies and procedures governing the management and financing of the educational program, which will ensure that clinical faculty are appropriately recognized and rewarded for their contributions to the medical students' education program.

Fifth, they must make clear to department chairs and other members of the institution's leadership that medical student education is the primary and unique mission of the medical school, and that they are responsible for being attentive to the quality of the educational experiences offered by their faculty.

In Phase II of the project, the Association will focus attention on the issues of concern noted above, and will develop programmatic activities that will assist individual medical schools in their efforts to address the issues within their institutions. Clearly it is time for the members of the medical education community to address satisfactorily the issues that were first brought to their attention by the 1984 report of the GPEP Panel. Despite the generally high quality of American medical education, deans and faculties must do more if tomorrow's medical school graduates are to meet the expectations of the profession and the public. Improving the quality of the clinical education of medical students is an important challenge that deserves the full attention of the academic medicine community.

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General References


