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The AAMC Project on the Clinical Education of Medical Students

Clinical Skills Education

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Prologue

Several years ago, the AAMC was presented with a great opportunity when Don Nutter, vice dean at Northwestern University School of Medicine and AAMC secretary for the LCME, indicated that he would like to spend a year as a Petersdorf Scholar-in-Residence studying the state of the clinical education of medical students in this country. Don's work during that year set in motion a series of activities that have resulted in both institution-specific and national efforts to improve medical students' clinical education. The study described in this report is one example of the kinds of activities that were stimulated by Don's work.

Gene Corbett, the author of this report, spent the 2002-03 academic year as a Petersdorf Scholar-in-Residence studying how clinical skills are being taught. His findings extend in important ways the observations made during the course of Don's project. In so doing, they highlight the need for medical schools to do a better job in developing and implementing an organized approach for teaching fundamental clinical skills during the medical school experience.

Gene's work has already had an impact. The AAMC Task Force on Clinical Skills Teaching – a task force that includes representatives from all of the major organizations representing clerkship directors – was formed by Gene during his time at the AAMC. The task force is at work developing a consensus statement on the teaching of clinical skills. His work is also responsible in part for the

involvement of the AAMC in a collaborative project with The New York Academy of Medicine, which has been designed to enhance education for the clinical transaction. The project, which is funded by the Josiah Macy, Jr. Foundation and the Arthur Vining Davis Foundation, has awarded grants to six medical schools to assist them with their efforts to develop and implement innovative approaches for the teaching of fundamental clinical skills.

Gene's report is important not only for what it tells us about the current state of the teaching of clinical skills in medical schools, but also for what it tells us about the failure of medical schools to focus sufficient attention on this issue over the years. His message is particularly important because of the perspective he brings to the issue. His views reflect not only the experience of a faculty member who has been teaching clinical medicine for many years, but also the experience of a physician who practiced general medicine in the community for eleven years after completing his formal education. It is clear that both experiences shaped his judgment that medical schools need to do a better job in teaching clinical skills. I have no doubt that Gene's work, like Don's, will have an important affect on how clinical medicine is taught in the future.

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“On the pedagogic side, modern medicine, like all scientific teaching, is characterized by activity. The student no longer merely watches, listens, memorizes: he *does*. His own activities in the laboratory and in the clinic are the main factors in his instruction and discipline. An education in medicine nowadays involves both learning and learning how; the student cannot effectively know, unless he knows how.”

Abraham Flexner, 1910

Introduction

Patients expect physicians to be knowledgeable and to use their knowledge skillfully to provide medical care in a professionally competent manner. The mandate for medical education is to educate and train physicians who can meet those expectations. To that end, undergraduate medical education programs are expected to provide learning experiences that will allow each aspiring physician to acquire the knowledge, skills, and attitudes deemed appropriate for medical school graduates. Ideally, those programs will ensure that students have the opportunity to begin to develop that set of basic clinical skills they will need to care for patients throughout their professional careers.

I have been interested in the quality of the clinical skills education provided by medical schools since the earliest years of my medical practice. Shortly after I entered general practice, I recognized that I needed to learn on my own many of the basic skills that were required to provide care efficiently and effectively to patients seeking my help. Although I felt reasonably book-smart, I became aware that I did not have the skills required to engage and build relationships with many kinds of people, and that I had to learn and relearn important aspects of the physical exami-

nation. I especially struggled with placing my clinical decisions in the context of my patients’ personal lives, financial limitations, and family related constraints.

After being in practice for a while, I realized that the clinical skills education I received in medical school had been unstructured and unspecified. Rather than stating explicitly the clinical skills I needed to acquire and providing opportunities for me to learn them, it was assumed that I would acquire them during the course of my clinical rotations. As a consequence, I, like most students both then and now, set about trying to learn all of the facts I could learn about the diseases I encountered, rather than focusing on acquiring the elementary clinical skills necessary to interact with and manage the care of patients. I clearly did not approach developing clinical skills proficiency with the same intensity and developmental rigor I did in acquiring clinical knowledge. I wondered why the clinical skills education I received in the formative years of my medical education hadn’t been conducted in a way that would have better prepared me for the challenges of clinical practice. It seemed to me that there must be a way of teaching these basic skills that would be more effective from a developmental educational perspective.

I became more concerned about clinical skills education when I returned to the academic environment after eleven years of community practice. I observed that the clinical skills education of students had remained unstructured and unspecified. I noted the dominating influence that acquiring knowledge was having on the education of students, and I could not help but note that medical students were becoming increasingly marginalized in the clinical care environment. The opportunities for students to participate at a meaningful skill-learning level in ongoing clinical care in both hospital and clinic settings seemed to



be becoming more limited with each passing year. Coupled with the fact that much of the fourth year had become elective, it seemed to me that the opportunities students had to develop basic clinical skills proficiency were becoming quite limited.

I do not believe things have improved to any considerable degree during the ensuing years. Indeed, a recent survey at my own institution revealed that fourth year students perceive major gaps in their preparedness for residency training because of deficiencies in their clinical skills education. A similar observation is contained in the recent AAMC report on the Clinical Education of Medical Students and in a number of other recent publications about students' clinical skill ability. These observations are noteworthy, since five major reports focusing on the quality of undergraduate medical education, which were issued in the 1980s and the early 1990s – three by the AAMC, one by the AMA, and one by the Macy Foundation – commented on the need to improve the clinical skills education of medical students.

Fortunately, there are a number of changes occurring in response to growing concerns both in this country and abroad about the quality of students' clinical skills education. Medical educators at some institutions are developing alternative methods to teach and assess clinical skills, to include the use of standardized patients, computer simulations, and body models. Schools in Europe in particular are implementing explicit and detailed clinical skills curricula. There is also a growing effort on the part of both licensure and certification bodies to incorporate measurement of clinical skills competency in their examinations of students and residents.

When the opportunity presented itself for me to spend a sabbatical year studying clinical skills education at the Association of American Medical Colleges as a part of the AAMC Project on the Clinical Education of Medical Students, I embraced the idea enthusiastically. In this capacity, I set about to study and inspect in one year all that I might in order to document as best I

could the state of clinical skills education in medical schools. I wanted to learn about the clinical skills curricula that were offered by medical schools and use that information to help me better define and organize the domain of skills to be learned in medical school. I also wanted to conceptualize what a four-year developmental clinical skills curriculum might look like and how best to implement it. This experience provided me an opportunity to participate in a variety of medical education activities both here and abroad, and to interact with literally hundreds of thoughtful and committed educators who struggle with these issues each day in their own institutions.

The project I pursued was exploratory and iterative in nature. There was no investigative hypothesis beyond my own concern that the clinical skills education of students may be the weakest link in our formative medical education process. The basic intent was to investigate what is known about the clinical skills education of students and to learn what is occurring in institutions in this country and abroad to improve the education of medical students in the realm of clinical skills development. What I learned has led me to conclude that there is much that needs to be done to improve the teaching and learning of clinical skills in the medical school curriculum. I have also discovered that the traditional implicitness of skills education in the undergraduate medical education process makes it difficult to fully appreciate what is actually occurring in the day to day clinical activities that medical students experience. Nonetheless, it seems to me that Flexner's admonition to medical educators is as applicable today as it was a century ago. I hope this report, which focuses only on the state of clinical skills education, will increase the attention paid to this fundamental educational responsibility.

Project Objectives

The overall project I designed was intended to serve the goal of the AAMC Project on the Clinical Education of Medical Students by focusing on the clinical skills education of medical students. The specific objectives of the project were to:

- to document the status of clinical skills education in U.S. medical schools
- to identify model approaches for teaching clinical skills
- to develop and set forth principles that might guide the design of an ideal clinical skills curriculum
- to make recommendations for improving clinical skills education in undergraduate medical education

In addition, I anticipated that the project would accomplish the following:

- Disseminate information about the state of clinical skills education
- Promote a national dialogue about evaluating and improving clinical skills education
- Assist individual medical schools in their efforts to improve the quality of the skills education of students
- Promote a national dialogue on how to achieve a fully integrated and developmental clinical skills curriculum across the continuum of undergraduate and graduate medical education

Project Activities

In order to document the status of clinical skills education, I conducted the following activities between July 2002 and June 2003:

- A comprehensive review of the literature on the clinical skills education of medical students
- A review of existing databases pertaining to undergraduate medical education (CurrMIT, AAMC Graduation Questionnaire, LCME surveys of medical schools)
- A review of historical reports pertaining to the clinical skills education of students
- An e-mail survey of the curricular deans of all U.S. and Canadian medical schools to gain information on clinical skills curricula and facilities
- Site visits to ten clinical skills centers (six in the U.S. and four in Europe)
- Attendance at medical education meetings (seven in the U.S. and three in Europe) to participate in discussions with medical educators and students about clinical skills education
- The establishment of a collaborative effort with national clerkship organizations for the purpose of developing consensus regarding clinical skills education in U.S. medical schools

Observations

Based on the results of the project activities listed above, it is possible to draw some general conclusions about the state of clinical skills education, to include the assessment of students' performance, in U.S. medical schools. The observations made during the course of the project are presented in three sections: the state of the clinical skills curriculum, the assessment of clinical skills, and the development of clinical skills centers.

Clinical Skills Curriculum

It is clear that there is no curricular standard and much variability within the medical education community regarding the clinical skills education of medical students (see Fact Sheet, p. 5). Very few schools appear to approach clinical skills education as an explicit developmental process throughout the four years of the curriculum. Only a minority of U.S. medical schools have explicit clinical education objectives that guide the clinical skills education of students. For those that do, there is wide variation in the skills specified. Most medical schools provide some formal clinical skills education, primarily during the first and second years of the curriculum. There is substantial variation in the degree to which clerkship disciplines participate in an organized way in teaching and assessing clinical skills. There continues to be an assumption that students acquire the clinical skills required for post-graduate training during clerkships, but most schools do not determine if this is in fact happening. There also is no explicit clinical skills developmental process that formally bridges the continuum of undergraduate and graduate medical education.

Clinical Skills Assessment

Few schools have an organized approach for assessing clinical skills in a developmentally explicit manner. While the majority of schools assess clinical skills ability at some time in the curriculum, the assessment exercises do not systematically and comprehensively relate to a clear set of objectives for clinical skills education. Standardized patient programs, which are becoming a popular method of

assessment, exist in more than three-quarters of U.S. medical schools, primarily for the purpose of teaching and/or assessment of communication, history-taking, and some physical examination skills. For schools with these programs, the majority report that they use the information from these exercises for making decisions about student progress. Schools employ standardized patients (SPs) to assess certain clinical skills at different times during the clinical curriculum. In the majority of schools, students are required to pass an examination that includes the assessment of selected clinical skills before they can graduate. The number of schools employing SPs for final assessment purposes increased greatly (n=26 to 67) during the past decade. However, the use of paper and pencil examinations for the assessment of clinical skills ability remains in place in about one-fifth of medical schools. Many fewer schools (n=25) formally assess student clinical skills using direct faculty observation of student performances.

Overall, clerkships use standardized patients and objective structured clinical examinations (OSCE) for student evaluation about half of the time. Some discrepancies exist between students and medical schools in the reporting of the methods used and the frequency of clinical skills evaluation in the clinical years. Students report direct observation by faculty as occurring less often than medical schools report the same information. According to students the frequency of faculty participation in both observation and feedback about physical examination ranges between 40 percent and 80 percent. It is noteworthy that over a quarter of graduating students have reported that they have never been observed taking a history and performing a physical examination by a faculty member. A minority of students report having been required to successfully pass an OSCE at the completion of any of the required clinical clerkships. On the other hand, schools with established skills programs assess students more often and with a wider range of assessment methods including faculty observation, OSCE, computer case simulation and peer evaluation.



The Fact Sheet below provides information pertaining to the status of clinical skills education in U.S. medical schools. The data depicted in the table are drawn from a variety of sources – LCME Annual Medical School Questionnaire (2002), AAMC Graduating Students Questionnaire (2002), Curriculum Directory (2002), and a survey of asso-

ciate deans for medical education (2002). In some cases, data from more than one source were available for one item. Variation in the denominator is a reflection of each dataset sample size. In some instances, the denominator includes both U.S. and Canadian medical schools.

Clinical Skills Education Fact Sheet

	No. (%)
U.S. medical schools with explicit competency-based learning objectives	17/62 (25) 15/59 (27)
U.S. and Canadian medical schools with any formal clinical skills curricula	34/142 (24) 32/62 (52)
U.S. and Canadian medical schools with formal skills curricula in the clinical years	5/142 (4) 8/62 (13)
U.S. medical schools with an explicit list of clinical skills to be learned	27/62 (44)
Specified categories of clinical skills to be learned:	
Communication	12/62 (19)
History-taking	13/62 (21)
Physical Examination	11/62 (17)
Basic Clinical Testing	14/62 (23)
Basic Procedures	16/62 (26)
U.S. and Canadian medical schools with a clinical skills education facility:	
Yes	34/62 (59)
Planning	9/62 (15)
U.S. medical schools with standardized patient programs for instruction:	
Communication skill	104 (83)
History-taking	109 (87)
General physical exam	98 (78)
Specialized physical exam	116 (93)
U.S. medical schools with standardized patient programs for assessment:	
Basic courses	100 (80)
One or more clerkships	82 (66)
Final comprehensive	58 (46)
U.S. medical schools with any form of final clinical skills assessment:	36/53 (68) 71 (57)
Forms of final clinical skills assessment:	
Direct observation	25 (20)
Paper & pencil	20 (16)
SP/OSCE	67 (54)
Computer Simulation	8 (6)
Oral examination	5 (4)
Students' report of being observed by clerkship faculty in the performance of physical examination:	
Family medicine	(71)
Psychiatry	(69)
Internal medicine	(65)
Pediatrics	(64)
Ob/Gyn	(51)
Surgery	(40)

Clinical Skills Centers/Laboratories

The establishment of clinical skills centers or laboratories to facilitate the teaching and assessment of clinical skills is one of the more recent developments occurring in medical schools. Thirty-four U.S. and Canadian medical schools indicated in response to an e-mail query that they had established a clinical skills center for teaching and assessing students' clinical skills. Nine additional schools indicated that they were in the process of establishing such centers. Clinical skills centers in the United States generally focus upon the teaching and/or assessment of communication and history-taking skills as well as some physical examination skills. Centers in Europe also consistently focus on physical and mental examination as well as basic clinical testing and procedure skills. Detailed review of established clinical skills center programs reveals significant variations in teaching and assessment activities, and in the ways that these activities are conducted from a programmatic and curriculum perspective. Observations made during the site visits (six U.S. sites, three U.K. sites, and one site in the Netherlands) revealed the following:

- While some centers continuously coordinate the teaching of clinical skills within the medical school curriculum (n=6), others function primarily as a resource for departments wishing to conduct an assessment activity (n=4)
- There is substantial variation in the frequency with which students participate in center activities during the course of their education (range 2 to 140). The more frequently a student is involved in center activities, the more likely this involves repetitive opportunities for skills learning and assessment throughout all the years of the curriculum.
- Although most programs provide formal feedback to the student, the composition and form of the feedback varies from school to school. At three centers, clinical faculty do not participate in the student feedback process. At one center, feedback to the student is optional.
- Most centers have a medical director who is responsible for overseeing the use of the facility for teaching and/or assessment activities.
- The degree to which members of the clinical faculty participate in the assessment exercises conducted in the center is highly variable from school to school and from department to department within schools. At most centers, clinical faculty participation is sparse and limited to a few selected or interested faculty. The most common use of centers is for the conduct of summative assessment exercises.
- A minority of centers conduct customized programs to address individual student's remediation needs.
- As a general rule, students participate in center assessment exercises more frequently during the early years of the curriculum than they do during the clerkship years.
- Communication and history-taking skills are uniformly a part of center activities.
- There is substantial variation in the degree to which physical examination skills are represented in center activities.
- A few centers allow students to use the facility for self-directed learning.
- With some exception, there is generally no effort to use the center as a resource for faculty development.
- Although program evaluation is a uniform part of the conduct of center activities, there is considerable variation in the ability to access and observe skill performance databases.

Summary

Overall, from the data that are available, it appears that contemporary clinical skills education in the U.S. undergraduate medical curriculum continues to remain a largely implicit process with wide variability among schools in the attention and detail given to this essential educational activity. This implicitness, lack of comprehensiveness, and wide content variability is the norm within schools and clinical disciplines. Despite the fact that medical students in the United States can continue their postgraduate education almost anywhere in the country, it is noteworthy that there is no national consensus on what comprises basic clinical skills education. This situation contrasts to the uniform manner in which clinical knowledge standards are upheld in curricular, licensing, and certification processes. Formal attention to students' skill development seems under standardized and perhaps substandard. From a historical perspective, it appears that emphasis upon clinical skills education has diminished to a level that requires the focused attention of medical educators everywhere.

Educating about clinical skills involves a distinct set of teaching and learning behaviors. At the one-on-one education level, the most essential elements required for effective clinical skills education are:

- A skilled and willing teacher
- An appropriately prepared and motivated student
- An informed and willing patient
- Time and opportunity for repeated skills practice, including exposure to a sufficient number and diverse group of patients
- An attitude of shared professional responsibility toward the patient by the student and teacher
- Time and opportunity for effective feedback between teacher and student

From an overall educational perspective, two key conditions are necessary for guaranteeing that such teaching and learning activities are embedded in the curriculum. First, guiding and improving the clinical skills development of students requires a thorough delineation of the clinical skills that should be taught during the medical school experience so that both students and faculty are aware of their responsibilities in ensuring that these are learned. Second, there is a need to delineate how and when those skills should be learned as students progress through the curriculum. It is doubtful that students can acquire the clinical skills needed if these two conditions are not met.

In addition, there are at present two major obstacles that must be addressed if medical schools hope to improve the clinical skills education of their students. First, they must recognize the time-intensive nature of skills education and adopt policies and procedures for supporting and rewarding members of the clinical faculty who are responsible for the teaching of clinical skills. There is no question that in order to teach skills effectively, a considerable commitment on the part of the responsible faculty members is required. Service productivity demands now placed on faculty in the clinical environment are an obstacle to this occurring. It is also clear that many members of the clinical faculty are not willing or able to make the commitment required to teach clinical skills effectively because they are not rewarded for doing so. Medical schools must therefore adopt policies that will reward and financially compensate faculty members for the time they commit to teaching medical students the essential clinical skills they should acquire prior to progressing into their residency programs.

Second, medical schools must recognize that increasing specialization in medicine is making it progressively more difficult to identify faculty members who have both the interest and confidence required to teach basic clinical skills. Most

members of a specialized clinical faculty prefer to teach primarily within their immediate area of expertise. Thus, it can no longer be assumed that any member of the clinical faculty who is assigned clinical teaching responsibilities can and will consistently teach generic clinical skills to students. Given this reality, medical schools must identify a core group of clinical faculty who will accept responsibility for teaching clinical skills to students. In our current service-oriented climate, for example, a teaching faculty member may not be the same as the attending of record on the clinical services to which clerkship students are assigned.

In order to achieve clinical skills proficiency in medical school, the opportunity to learn and practice skills needs to be an integral and continuing part of the undergraduate medical curriculum. Because of existing barriers to optimal clinical skills education, a more explicit educational process is needed to achieve this goal. Specific clinical skills curricula are necessary to help ensure that the continuing opportunity to learn and practice skills exists throughout the undergraduate medical school years. Schools that have formal skills education programs appear to have improved educational experiences and engender better clinical skills educational outcomes. In the design of a clinical skills education curriculum, institutions should develop:

- A set of overall clinical skills education objectives
- Specified levels of clinical skills development throughout the four-year curriculum
- A list of specific skills to be learned before graduation
- Designated experiences for clinical skills learning throughout the curriculum
- A developmental clinical skills-assessment process which includes both formative and summative elements
- A system for providing continuing and individualized feedback to students about their clinical skills development

- Opportunities for clinical skills remediation and self-directed learning
- A system for assisting faculty in the development of the teaching and assessment abilities required for implementing effective clinical skills education.

Because of the national context within which students may progress in their undergraduate and postgraduate career development, the apparent underdevelopment of clinical skills curricula generally, and the multiple barriers which currently exist toward achieving this basic undergraduate medical education goal, it would be helpful if a number of things occurred nationally.

- A national consensus on the clinical skills education of medical students which includes:
 - a set of recommended clinical skill education objectives including a set of specific clinical skills to be learned during the undergraduate medical experience
 - principles for guiding the teaching and assessment of clinical skills
 - guidelines for the development and implementation of an explicit four-year developmental clinical skills curriculum.
- Resources and recommendations regarding the design, development, and use of clinical skills teaching and assessment facilities
- Recommendations regarding the use of standardized patients, computer simulations, and related instructional techniques in the overall teaching and assessment of clinical skills
- A national program for providing resources, advisement, review, and evaluation of clinical skills education programs
- A national effort to involve both undergraduate medical and postgraduate clinical training organizations in the development of a shared perspective on clinical skills education.

Acknowledgements

I am grateful to many for providing me the opportunity to spend a sabbatical year at the Association of American Medical Colleges. This includes many colleagues at the University of Virginia, particularly Dr. Sarah Corley, for taking care of my patients in my absence. Dr. Evan Heald deserves a special word of thanks for his careful and exemplary role as acting Ambulatory Clerkship Director. I owe a special appreciation to the many faculty at visited institutions both here and abroad who offered their time, ideas and expertise to this project, and to the even greater number who exchanged ideas and conversation over the Internet. I am also grateful to Jan Thomas who consistently undertook the challenge of coordinating my complex schedule at the University of Virginia, and to the wonderfully helpful staff in the Division of Medical Education at the AAMC who shared in a supporting role. A very special appreciation is due Michael Whitcomb, Deborah Danoff and Brownie Anderson for their limitless help and guidance, and for creating such an engaging and stimulating environment within which to work. I also wish to acknowledge the support of the Anne L. and Bernard B. Brodie Endowment for financial support during my sabbatical year.

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