



ASSOCIATION OF
AMERICAN
MEDICAL COLLEGES

**MEDICAL EDUCATION
IN THE UNITED STATES:**

A Student Perspective

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**Organization of Student Representatives
Association of American Medical Colleges
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**The Organization of Student Representatives
of the Association of American Medical Colleges**

**Medical Education in the United States:
A Student Perspective**

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EXECUTIVE SUMMARY

Today's medical students and residents recognize the need for changes in the American health care system. They also understand that health care reform demands a viable educational process that will train physicians to meet both current challenges and new demands created by that reform. The Organization of Student Representatives (OSR) is eager to form meaningful partnerships with legislators to offer assistance in the development of sound policy affecting medical education and believes that a fundamental understanding of medical education is crucial for the development and implementation of policy fit to govern the practice of medicine and to facilitate the education of dynamic physicians for the future.

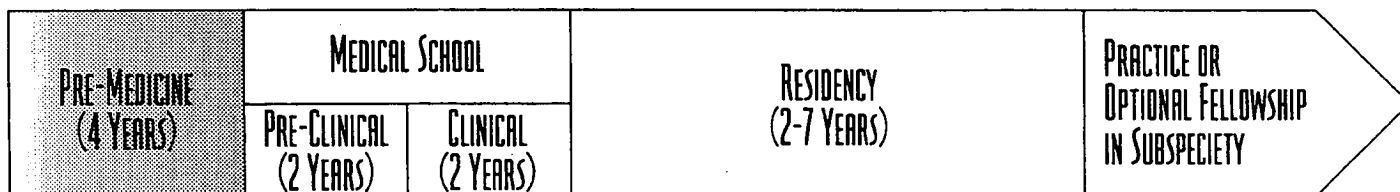
Medical students and residents possess a unique understanding about the health of medical education as well as medicine in a cross section of clinical populations; students experience medical practice across a spectrum of settings – community, university, VA and public hospitals, and beyond. As a result, medical student and resident perspectives can prove extremely valuable as policy makers struggle to identify the nation's health care needs and the role that medical education must play in meeting these needs.

The OSR hopes that this document will offer insight into the complex process of educating physicians, dispel myths about this process, and exemplify the desire of medical students to open lines of communication with legislators to better develop solutions to the health care dilemmas facing the nation regarding health care policy.

The following themes are further developed in the attached sections:

1. Potential medical students describe diverse motivations for applying to medical school, including: the daily rewards of helping individual communities; the intellectual challenge of modern medicine; the many career options afforded by a medical degree; and encouragement from role models.
2. Preparation for a medical career often begins years before applying to medical school, with rigorous premedical course work and preparation for the Medical College Admissions Test (MCAT). Many more students apply to medical school than are admitted. Pre-medical students must make many academic, financial, and emotional sacrifices with the hope that they will receive an acceptance to medical school.
3. Actual medical school demographics bear little resemblance to the stereotypical view of medical students. Relatively few medical students come from wealthy families. Fifty-seven percent come from families of clerical workers, teachers, small business owners, sales people, or white- or blue-collar workers.
4. Increasingly, older "non-traditional" students are applying to medical school. Many have families to support or lucrative professions they have chosen to leave. Medical schools find these non-traditional students to be extremely valuable assets and show an increasing willingness to accept their applications.

5. Through initiatives such as Project 3000 by 2000, medical schools hope to correct significant minority under-representation by attacking barriers erected prior to medical school – at the high-school or even junior high-school level.
6. The traditional four-year medical school curriculum begins with two years of basic science lectures and labs. The second two years consist of clinical rotations through hospital and outpatient clinic departments including surgery, internal medicine, pediatrics, obstetrics/gynecology, and psychiatry.
7. Personal and educational experiences bring medical students into close contact with many medically under-served communities. Through a variety of community service programs, these students have found creative means of aiding the needy and giving back to the towns and cities that support their schools.
8. Only sixteen percent of 1992 medical school graduates chose a specialty before medical school; forty-one percent decided on a specialty in the third year, and almost nineteen percent decided during the fourth year (As many as thirty-eight percent change their minds during residency). Students have many reasons for choosing a particular area: intellectual satisfaction, the nature of patient contact, positive role models, and a pleasant clinical experience can all play an important part in the decision.
9. Medical school graduates are M.D.'s, but they require additional training before they can practice medicine independently. These new physicians continue their education through one year of internship, three to seven years of residency and often additional subspecialty training in a fellowship. Residents function as both physicians and students, practicing under the supervision of "attending" or senior physicians. Residencies impose many demands on young physicians including responsibility for human life, severe time constraints, economic pressures, and intellectual stress.
10. Financial concerns of medical school continue into residency. In 1992, for the seventy-nine percent of medical graduates borrowing money, the mean debt was \$55,859; over twelve percent had a debt in excess of \$75,000. The national average for a first-year resident salary in 1992 was \$28,238. Based on this statistic, if one calculates the average hourly wage of a first-year resident with an eighty-hour work week, wages are about \$7 an hour. The magnitude of educational debt often makes meeting living expenses difficult and loan default a very real possibility; the provision of deferment during this period is therefore critical for many residents.



I.

The Pre-Medical Experience

In 1992 37,410 men and women applied for 16,289 positions in medical schools across the country¹ and thus embarked upon the long process of medical training. Preparation for a career in medicine, however, begins long before applying to medical schools – starting, in fact, early in college with premedical education. As a result of the various premedical requirements and the need to maintain strong grades, medical students usually make a commitment to their career choices several years before applying to medical school – gambling that their efforts will result in an acceptance.

Throughout their college years, hopeful applicants work to fulfill the stringent requirements for acceptance to medical schools. Although academic requirements vary, most medical schools seek a good foundation in the natural and social sciences and the humanities as well as strong communication skills.² Students contemplating medical school generally complete at least one year each of biology, physics, inorganic and organic chemistry; most also take one or more semesters of calculus.² "Pre-medical studies" does not generally constitute a major so students complete additional courses for a degree. The majority (63%) choose degrees in the sciences although an increasing number now major in the arts and humanities.¹

Most medical schools also require the Medical College Admission Test (MCAT): a six hour exam usually taken in the spring of a college student's junior year or during the subsequent fall. (Potential applicants who have already graduated college must also take this exam.) The MCAT provides a standardized assessment of a student's basic scientific knowledge, analytic skills and writing ability.² Although the MCAT score accounts for only a part of the student's entire application, prospective medical students invest substantial time and effort in preparation for this important exam.

Another important factor in the applicant equation is the human factor – the personal attributes that future physicians need for successful careers in clinical or research medicine. In general, admissions committees look for well-rounded candidates who demonstrate leadership, social maturity, motivation, and common sense.² To gather information on this aspect of the applicant, admissions officers depend on essays written by the students, recommendation letters, interviews, and any information on extracurricular activities. Schools also seek to learn why an applicant wishes to become a physician and, often, for past experience in health care.

Students describe diverse motivations for applying to medical school. Many point to the rewards of helping individuals and communities; others look forward to the intellectual challenge of modern medicine or to the diversity of career opportunities that physicians enjoy.³ Encouragement from family, friends, professors, and physicians also play a significant role in the decision to pursue this field.⁴

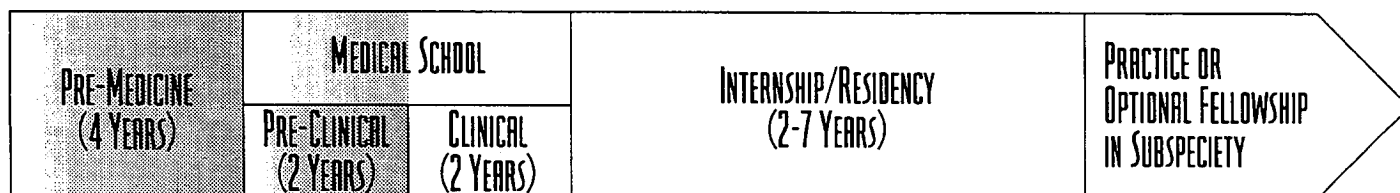
Unfortunately, the cost of a medical education has also become an important consideration. The mean educational debt of an indebted student graduating in 1992 was \$55,859, and debts of \$120,000 are not uncommon for graduates from private institutions.⁵ In a survey of students who took the MCAT but then decided not to apply to medical school, 35 percent cited financial concerns as their major reason.*

Other issues of concern to the medical community as a whole appear to be discouraging some good students from pursuing medical careers. These concerns include malpractice, increasing public intervention in the private doctor-patient relationship, and fear over HIV and tuberculosis risk.⁴

For those who complete their pre-medical requirements competition within the admissions process remains stiff. Last year medical schools accepted fewer than 50 percent of all applicants, and admissions standards continue to rise in response to a slowly growing applicant pool.¹

Those who do not receive an acceptance often reapply later while others seek out other career options. Those who successfully negotiate the premedical years and the medical school application process can now embark on the challenging, extraordinary experience of medical school.

*Those students who receive acceptances to medical schools but lack the means to finance their educations pursue a variety of courses: select other careers; delay entering medical school and work for several years to offset the cost of their education; turn to scholarships (Over 10% of scholarship recipients in 1991's graduating class received financial assistance through the Armed Forces Health Professional Scholarship Program, which provides full tuition and a monthly stipend in exchange for four years of active duty as a military doctor. Just over 1% received scholarships from the National Health Service Corps, and will spend the next four years providing medical services to needy communities. Seventeen percent received Exceptional Financial Need Scholarships and 8.2% received Financial Assistance to Disadvantaged health Professions Students.¹²); or seek loan forgiveness (many states sponsor loan forgiveness programs through which students agree to spend a number of years in an underserved area in return for assistance in repaying loans). Schools and other foundations also provide much-needed funds to a small population of medical students.¹³



II.

The Entering Class of Medical Students: Medicine's Changing Face

"I stopped at a gas-station one day," a medical student explained. "The attendant saw the school sticker on my car and said, 'I told my friend just the other day, a medical degree is just an excuse to make money off of dying people. You're a lucky kid.'" If asked to describe the typical medical student, many people would probably call forth much the same image -- that of the pampered young white man following his father's footsteps into medicine and hoping to achieve wealth and respect. While the demographics of this stereotype may once have held true they have long since changed. In fact, although there remains room for improvement, medical schools have achieved a level of diversity never before seen in this profession.

Historically, medicine has been dominated by men, but women have made substantial inroads into the field. Currently, women constitute over forty percent of the matriculants to medical schools.⁶

The ethnic composition of most medical school classes has also become more diverse. Nationally, the percentage of whites entering medical school is decreasing, and the percentage of under-represented minorities (African Americans, Native Americans, Mexican Americans and Mainland Puerto Ricans) is increasing. In 1992, 68% of the entering class was white, down from 81% a decade ago while the percentage of African Americans increased from 6.6% to 8.3%. Similarly, the percentage of other under-represented minorities increased from 2.9% to 4.0%.⁶ Overall, the proportion of under-represented minorities grew from 9.4% of the entering class in 1982 to 12.4% in 1992.⁶ The largest increase among non-whites occurred in Asian and Pacific ethnic groups, growing from 5.4% to 15% of matriculants between 1982 and 1992.⁶

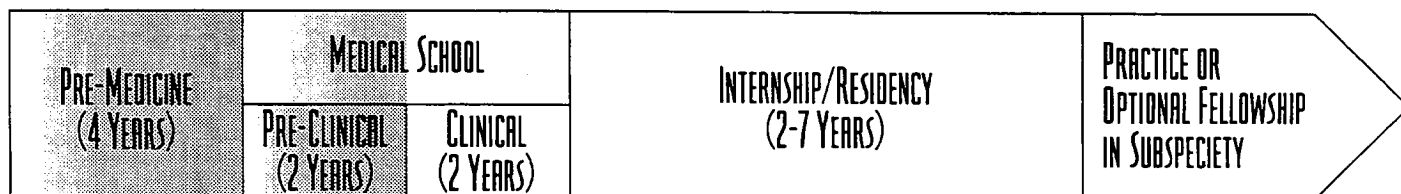
The small increase in matriculants from the under-represented minorities reflects the limited growth in the number of applicants from this group. In the last decade the total number of African American applicants has only increased from 2600 to 2917 (38.5% were accepted in 1982, 44.3% were accepted in 1992).⁶ To remedy this situation, the AAMC has initiated "Project 3000 by 2000," a project intended to increase the number of minority matriculants to 3000 per year by the year 2000.⁷ This would require a substantial increase in the number of minority applicants. The program seeks to foster greater interaction between medical schools, colleges, and high-schools in order to encourage interest in health care and to provide the academic support needed to attract more minorities into medicine.

Increasingly, older or "non-traditional" students are also joining the ranks of medical students. One student reported finding in his first year class a 34 year old mother of two teenagers, as well as several other married students with children. He notes that, "Their ability to succeed in medical school while raising a family was an inspiration to us all." Similar cases exist in every medical school in the country. Nationally, a growing number of students are either postponing medical school in order to pursue other interests first, or are deciding later in life that they wish to enter medicine. In 1991, 16% of the nation's first year class was 28 or older;⁸ up from 12% only two years earlier.⁹ Medical schools find these "non-traditional" students to be committed and valuable assets and have thus shown an increasing willingness to accept their applications.

Medical students possess a variety of prior educational experiences. Most students accepted to medical school in 1991 held bachelor's degrees in biological sciences (44%) or physical sciences (19%). However, 14% of the entering class had completed social science and humanities majors. Overall, 51% of non-science applicants were accepted while only 46% of science majors received acceptances. Some students also had advanced degrees: 6% with a masters and 2% having earned a doctorate.² Students may also choose to enter a combined degree program in medical school earning either a PhD or a Masters of Public Health along with their MD. Many of the former pursue careers in medical research while the latter often work in public health and policy as well as practicing medicine.

A substantial number of medical students come from middle class families: 32% of families earn less than \$50,000 per year, 16% earn less than \$30,000.⁸ Fifty-three percent of 1991 matriculants reported having entered medical school with previous educational loans (mean debt including educational and consumer debt: \$14,513)⁸ and about 80% will take loans in medical school.⁶ Nationally, the parents of over 80% of entering medical students are not physicians. They include homemakers and sales people, clerical workers, teachers, small business owners, white or blue-collar workers, the retired or the unemployed.⁸

The "typical" medical student is becoming more difficult to define as students arrive at medical school with a greater diversity of experiences. As a result, medical schools must now address a greater diversity of needs for scheduling and leave-taking; financial assistance; counselling; and ethnic, ideological, and social interactions. Students are working through a variety of national and local student organizations to aid medical schools in this process of adjustment. Ultimately, this diversity will prove essential to filling the many areas of need in a pluralistic American health care system.



III.

Transition to Medical School and Adjustment to First Year

For many, beginning medical school represents the realization of a lifelong dream and a reward for years of hard work. This is a time of gratification and great excitement but also of trepidation. Entering medical school begins one of our nations most strenuous and mythologized educational experiences. Even as first-year medical students begin training for a career devoted to caring for others, they enter into an environment which severely challenges their ability to remain physically and mentally healthy themselves.

A fourth-year medical student at the University of Connecticut aptly described his experience in medical school: "I have bachelors degrees in math and philosophy from MIT, a masters in psychology, and a law degree – medical school is an order of magnitude more intense than anything I have ever done before. When I started law school, I was a single parent with a seven year old son but I could still take a heavy course load including clinics and find the time for my son and other interests. Now I have a wife to help me, my son is older and medical school is still struggle."

Medical students must assimilate a staggering volume of knowledge in four years. To accomplish this, medical students routinely spend thirty hours a week in lecture hall and many additional hours in the library and laboratories. Students will often work from 8 am until late into the night. For many, the transition into medical school demands a significant restructuring of their lives as well as the priorities which they place on non-academic interests. For many students, medical school can become an all consuming endeavor.

Uncertainty and self-doubt often plague the first-year medical student. Fear of failure can prove overwhelming to students who have invested their dreams and aspirations in becoming physicians. As the pressures mount, many students begin to wonder how they will learn enough to care for a human life.

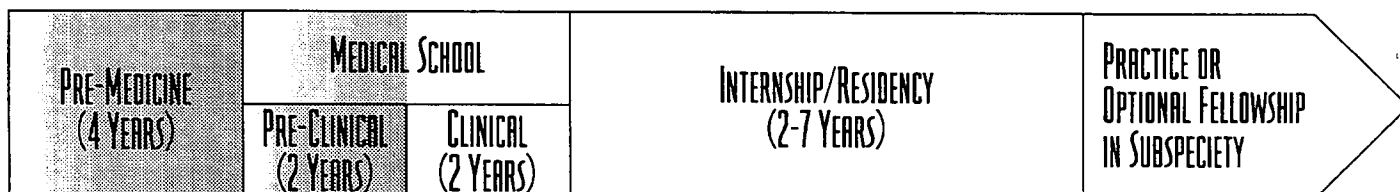
The heavy work load and uncertainty become more difficult to manage when students are unable to find strength in a group of close friends. Developing a new support network, however, and more generally just making friends and socializing, can be frustrated by a lack of free time. Additionally, family and close friends may have difficulty understanding the time which a medical students must dedicate to studies thus creating more stress.

Fortunately, medical schools make efforts to alleviate some of these stresses through orientation, and sophisticated academic, financial, and psychiatric counseling services. Many schools attempt to provide students with opportunities to pursue other interests as well.

Most medical students continue some involvement in extracurricular activities. Students can be found working in homeless shelters; teaching children about AIDS; volunteering at clinics, old age and nursing homes; actively involved in political organizations and social issues; or participating in a variety of academic, social, or student organizations. These students are making increasing efforts to give something back to the communities which surround and support their institutions (see Section VI for more on community service).

While medical school creates a highly stressful environment it also provides educational experiences very different from those at most undergraduate campuses. For the first time the medical student is treated more like a colleague than like a student. Thanks to relatively small class sizes - often between 80 and 200 students in total - students often enjoy more personal attention from deans and faculty. Initial contact with patients, frequently in the first semester, makes the potential value of book-learning come alive, and keeps the students' goals in sight. In short, a great deal of satisfaction accompanies each student's realization that he or she has begun training for what will hopefully be a long and rewarding professional career.

The transition to medical school marks the start of profound introspection as students begin to determine what interests they value most and to set priorities. Some find the compromises too great; the incidence of major depression among first and second year medical students is more than twice that of the general public.¹⁰ In spite of the challenges, however, most medical students ultimately earn their medical degrees (attrition rates in the U.S. medical schools are about 7%, lower than those for any other field in the allied health professions¹¹). The sophisticated, comprehensive system used to screen applicants, positive experiences counterbalancing difficulties encountered by students, and the fact that most medical students are highly motivated and dedicated to their goal of becoming a good physician all contribute to the high retention rates among medical students.



IV.

The Basic Sciences: The First Two Years of Medical School

Since 1910, when Abraham Flexner published his now famous report on the state of medical education in this country, most U.S. medical schools have followed the same teaching "blueprint" – traditionally beginning with two years of basic sciences (also known as "pre-clinical" years) followed by two years focusing on clinical experiences. Over the past eight decades schools have introduced many variations on this theme; however few have altered it substantially.

The first of the basic science years focuses on a fundamental knowledge in such areas as biochemistry, cellular and molecular biology, anatomy, pathology, microbiology, pharmacology, and physiology. During the second year, students move on to explore the disease process, the aging process, and conditions of wellness. Most schools also provide courses in medical ethics and decision-making, medical systems, statistics, and a variety of electives which faculty often "shoe-horn" into an already crowded lecture and laboratory schedule. Finally, students learn to interview patients and to perform physical exams; practicing first on one-another and then working with patients in local hospitals.

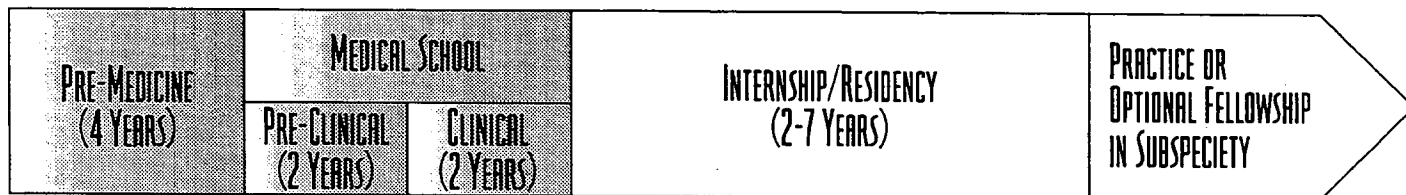
As technology increases and medical discoveries proceed at a rapid rate, the amount of information which schools must teach and students learn grows almost exponentially. Medical faculty face the challenge of imparting this ever increasing data base to students within a fairly inflexible time limit. The traditional medical school system of didactic lectures supported by extensive laboratory work and library time often requires that students spend their first two years in rote memorization of thousands of facts.

At many institutions, faculty and students have begun to explore alternatives to this system— often shifting from the traditional didactic structure toward a "problem based learning" system. Under this approach students – with faculty precepting – research and discuss sample cases, learning all information necessary to appropriately diagnose and treat the fictional patient. In such a system, students exercise initiative in directing their own educations, develop clinical reasoning, and practice information management skills essential to modern medicine. Some schools depend almost entirely on this system while many more schools have begun to incorporate the system into more traditional curricular formats.

Despite these developments, certain essential aspects of the pre-clinical years remain unchanged. In most institutions, students begin their first year of medical school with gross anatomy. For many, this course provides the first direct experience with death. Most will rank anatomy as one of the most compelling experiences of their education, often as memorable as delivering their first baby or helping to save a life for the first time. As the students explore the fascinating mysteries of the human body they begin to recognize the awesome responsibility which they will accept as physicians. This begins a process unique to medical education, that of molding a personal understanding of a physician's role in the provision of care and preservation of health as well as in the process of death and dying.

Ultimately, medical students must prove that they have learned enough to proceed to their clinical years. Step I of the United States Medical Licensing Exam (USMLE) – often called "the boards" – is a two-day, eight-hundred question exam designed to test for minimum competency in the basic sciences and many schools require that students pass the exam before moving on to the clinical years. (Students take Step II during their fourth year, and Step III during the first year of residency.) In addition, some residency programs, particularly in the more competitive fields, use Part I scores to screen applicants. Therefore, students often feel that their performance on this exam can substantially impact their careers.

Completing the USMLE Part I generally marks the end of the pre-clinical years. Students now possess the necessary knowledge to begin the clinical or "clerkship" years, however they have only begun to accumulate the knowledge needed to actually practice medicine.



V.

**The Clinical Years:
Third and Fourth Years of Medical School**

Students move from the lecture hall, where they study academic subjects, into the hospitals and ambulatory clinics where they directly participate in patient care during the last two years of medical school. Medical schools require rotations in several medical and surgical areas, including general surgery, medicine, pediatrics, obstetrics/gynecology, and psychiatry which students usually complete during their third year. Many schools include additional third-year rotations in neurology, primary care, emergency medicine, radiology or surgical subspecialties such as urology and orthopedics. Fourth year allows the student to further explore various areas of medicine or to function as an intern, taking on greater responsibility in preparation for residency.

The intricate hierarchy of attending physicians, residents, interns and third- and fourth-year students shapes the educational experience in a clerkship. The student usually joins a medical "team" consisting of an attending physician, a senior resident, one or more junior residents and interns, and the student. This team is responsible for the care of a given group of hospital patients. In many clerkships, a student works most directly with interns and junior residents who provide the majority of teaching in the practical and critical aspects of patient management, while the attending and senior residents provide oversight and add academic insight and greater experience to the teaching.

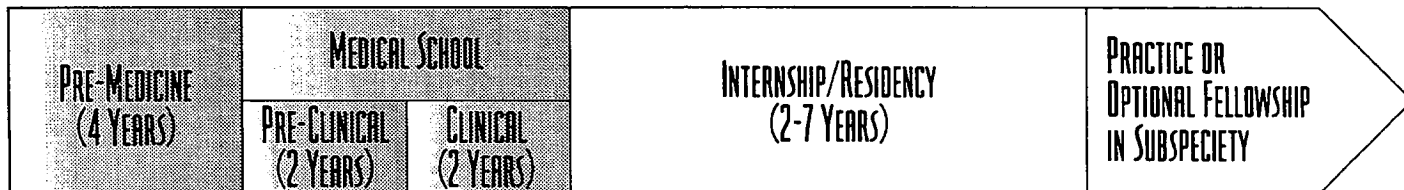
During a clerkship, students typically take medical histories and perform physicals on patients, follow the medical course of various patients participating in their care under the oversight of residents and attending, and learn to perform minor procedures such as blood drawing and suturing. Students also assist in various other duties of patient care such as checking lab results, following up on x-ray findings, arranging consultations with other physicians, and completing paper work. Additionally, throughout the clinical years, students continue to participate in regular lectures and discussion groups with attending physicians, residents, and sometimes with other allied health care workers. All together, depending on the rotation, the clerks spend between ten and fourteen hours per day in the hospital and generally take overnight call every third or fourth day.

Students may also spend time in outpatient clinics. Unlike the inpatient setting where students are more likely to observe as residents care for the patients, in the clinics students can evaluate, treat, and educate multiple patients every day all under the direct oversight of physicians. This direct involvement in patient care provides a valuable learning experience for students and also introduces them to outpatient management skills. With this in mind, many schools have instituted ambulatory care experiences for medical students and soon all schools will be required to do so in order to receive accreditation.

Although medical students often draw blood, insert intravenous catheters, and provide assistance in surgery, their relative inexperience may place them at increased risk for contracting infectious diseases when performing these potentially hazardous tasks. Despite education in universal precautions, the fear of contracting diseases such as AIDS, tuberculosis and hepatitis can weigh heavily on medical students and actual exposures such as needle sticks can cause turmoil for students and their families. Medical students live with the occupational risk of contracting a fatal disease and with fear of abandonment by the profession should this occur.

Medical students must learn to manage their responses to many difficult and emotional situations, including death and dying. The death of a patient can leave a student feeling sad, overwhelmed or numb. Additionally, medical students may find themselves participating in patient care decisions which they do not understand or with which they do not agree. Expressing these concerns can prove difficult, particularly when students depend upon good evaluations from those with whom they work. Students must learn to preserve a sensitivity towards their patients while maintaining enough emotional distance to allow appropriate clinical decisions. Striking this balance is a major task during medical school.

A student's experiences may differ greatly from month to month during clinical rotations, and learning experiences on the same rotation may be completely different for other classmates. A medical student's ability to demonstrate sensitivity and respect for others, his or her clinical skills, and often the area of medicine which the graduate chooses to pursue are all very dependent on good mentoring and strong role models. Positive experiences will help to produce positive and caring physicians. It is imperative that our doctors-in-training be treated with respect and compassion so that they can preserve their own compassion and respect for their patients.



VI.

The Community Experience

At Rush Medical College in Chicago, Illinois, one of the most popular courses for first-year students is a community health course organized by the Department of Preventive Medicine. This course offers students an early opportunity in a "real world" setting to deal with patients seeking health care. Continued enthusiasm for the course and a petition by the Rush Class of 1992 led to the formal creation of the "Rush Primary Care Clinic Project of 1990."

The project exposes medical students to training in primary care and provides the local community with additional access to health care. With appropriate training and supervision, first-year students perform basic triage duties. Second-year students are responsible for taking medical histories as well as performing health promotion and disease prevention education. By their third year, medical students perform physical examination and basic procedures while acting as "teaching assistants" for other students.

Rush's example illustrates three points regarding the community experience of today's students: first, community service represents an early opportunity for medical students to learn clinical medicine; second, community service projects enhance medical education by exposing medical students to issues not normally covered by traditional curricula -- including health care access, health care economics, cultural barriers to care, psycho-social issues in medicine, and the physician's role in the community; and third, such projects enable students to give back to the local communities which surround and support the medical schools.

Some schools, such as the University of Connecticut have introduced required community service experiences into their curriculum. The number of schools with such requirements is unclear however most medical schools sustain a wide variety of student driven voluntary community service organizations. The Liaison Committee on Medical Education (LCME) which accredits U.S. and Canadian medical schools currently recommends that all medical schools provide such experiences for their students.

The irony that many urban medical schools are located in communities in need of primary care and preventive medicine has not gone unnoticed. Medical students at the Baylor College of Medicine and the University of Texas Medical School wrote, "As students at the largest medical school complex in the world, we are a stone's throw away from neighborhoods where the infant mortality rivals that of the third world countries. As students and residents, we provide the bulk of medical care to indigent populations in the daily course of education. We recognize the increasing stress of our county and public health systems."¹²

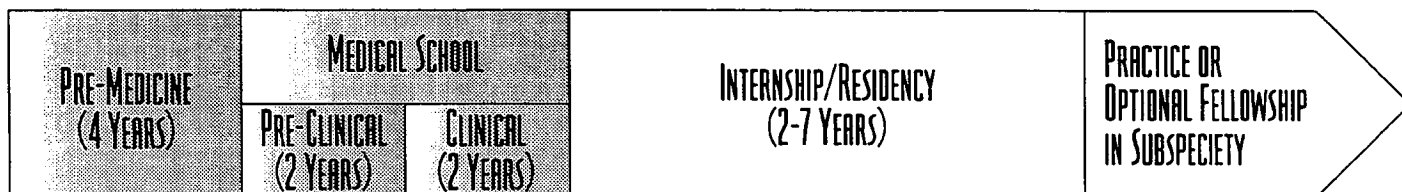
In response, medical students in Houston organized a conference to improve preventive services to prenatal and elderly populations. The second phase of the project called for students to take ideas from the conference and implement a model for preventive health programs for the identified populations in Houston.¹²

The range of student community service projects is as wide and distinctive as the range of the diverse communities in which medical schools are located. For example, the following are active efforts made by medical students across the country:

- At the University of Southern California, second year medical students organize a Spanish community health fair each year in East Los Angeles.
- In Columbus, Ohio, city school officials and Ohio State Medical students combine efforts to run a medically oriented community service and education project.
- Tufts medical students serve as mentors for minority and disadvantaged high school students interested in health care.
- At the University of Pennsylvania, medical students target high-risk populations of under served women in the West Philadelphia community for AIDS Education.¹²

Barriers to successful projects include the lack of resources and program continuity. The demands of traditional classroom and clinical rotations compete with the time available for such projects, since few medical schools set aside time in the curriculum for community service. Facilities and funding for supervision are limited, as few schools are able to set aside additional resources for student projects; student groups frequently apply for grants and mobilize the resources of private corporation and foundations.

Many medical students today are aware of the limited access to health resources in many communities. Despite the absence of formal requirements in many medical school curricula, medical students have demonstrated a great deal of resourcefulness and creativity in efforts to provide community service. They are expanding traditional education parameters – becoming familiar with issues such as health care costs, access and quality of care, and community leadership and responsibility. For the community, such efforts have the potential to develop into highly directed, cost-effective programs in such areas as preventive health education in communities throughout the country. These ongoing efforts by medical students reflect the growing understanding that the physician's responsibility extends beyond the hospital and the laboratory to encompass the complex factors affecting the health of this nation.



VII.

The Match and Preparing for Residency

Preparation for residency training – also known as "graduate medical education" – consists of an elaborate sequence of events beginning a full year before the start of the residency program year. Having completed third-year clinical rotations, medical students must choose a specialty, and begin the process of gaining entrance to the residency programs where they will spend the next few years.

Choosing a specialty represents the first and most pressing issue. Of 1992 medical school graduates, only 16% decided on a specialty before starting medical school; 41% decided on a specialty during the third year, and almost 19% decided in the fourth year. Only about 1% remained undecided after the fourth year.⁵ A good number will probably change residency programs after one or more years (As many as 25% of residents switch subspecialties within the same broad specialty area while another 13% completely change specialties – usually moving from pediatrics, family practice, and internal medicine to radiology, anesthesiology, and pathology).¹³

The structure of third-year clerkships tends to complicate specialty selection as these clerkships typically occur in large tertiary hospitals. Most physicians, however, spend much of their time in smaller hospitals, ambulatory care centers, clinics, or private offices. The traditional clerkship therefore provides valuable exposure to severe illness and its treatment in the hospital setting but not a good understanding of what one could expect as a practitioner in a particular field. In light of this problem, many medical schools are introducing office or clinic based outpatient experiences into the third year clerkships. At present, however, students must often base their specialty selection on fairly limited information about that specialty.

Each student has his or her own reasons for choosing a given specialty. Many feel a personal satisfaction with a particular field of medicine, whether it be the intellectual challenge, the technical challenge, or the quality of patient contact.⁵ Future lifestyle concerns are often an important factor, particularly among students planning families. For these individuals, specialties with particularly long work weeks or requiring more nights in the hospital may be less attractive. Often, specialty selection is linked to a positive experience or role model in medical school. Elective courses may also help consolidate interest in a particular field.⁵ The ease with which a medical student can secure a residency or the number of empty residency slots available in a given specialty area appears to have minimal influence. In most cases, many different and often intangible factors come into play, such that it can be difficult to define any single major influence on specialty selection.

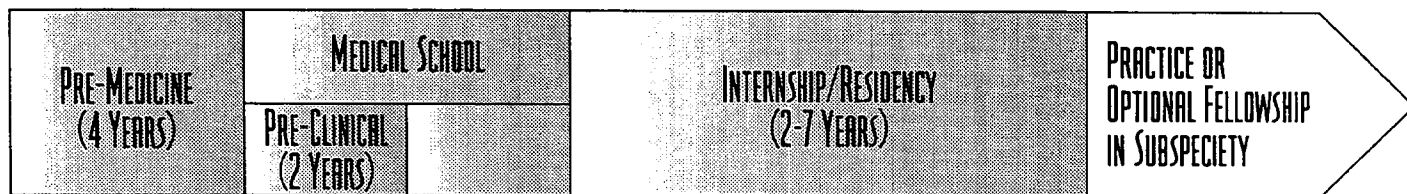
After deciding on a specialty, the medical student must select residency programs in that field to

which he or she will apply. Many of the same considerations go into this selection process as went into selecting the specialty. In addition, geographic location and academic reputation often prove important.

The students typically apply to anywhere from 3 to 25 programs depending on the specialty's competitiveness and the student's record.⁵ In general, residency programs select applicants based on medical school transcripts, a personal statement and *Curriculum Vitae*, letters of recommendation from medical school faculty and the Dean and, in some cases scores on the National Board of Medical Examiners Exam (the NBME: to be replaced by the USMLE in upcoming classes).^{5,14} Residency programs generally require an interview as well.

Most students (93% in 1992)⁵ apply to residencies through the National Residency Match Program (NRMP). A participating fourth-year student creates a ranked list of all the residency programs to which he or she has applied. The NRMP then "matches" a student to the residency that is highest on that student's list and that in turn selected the applicant. The process culminates with "match day" in mid-March when participating students discover the residency to which they are assigned. In 1992, of the 15,202 senior medical students utilizing the NRMP, 92.4% matched into residencies.¹⁵ Most "unmatched" applicants found positions with residency programs that have not filled all of their positions.

This system provides an orderly process by which medical students and residency programs can efficiently match. Clearly, the process creates substantial anxiety for many medical students since much of the most important medical education occurs during residency. Gaining entrance to the desired residency represents the culminating event of medical school for most students. As a result, the number of students from a given school matching to their desired residency has become an important measuring stick by which schools evaluate their curricula and by which college students evaluate the quality of a medical school.



VIII.

Graduate Medical Education: The Residency

The terms residency and resident derive from the late 1800's. Residency was a voluntary service through which medical school graduates could continue their education. They lived essentially as full time "residents" of the hospitals while providing services to patients on behalf of their mentors. The requirements for licensure and for the practice of medicine have increased drastically since those days. While licensure requirements vary by state, in most cases an individual must complete a four-year program in a medical school, pass national qualifying exams, and complete one year of post-graduate training (commonly called an internship) in order to practice medicine. However, most hospitals require that the physicians complete a full residency program after internship. Therefore, over 98% of medical school graduates go on to complete three to five years of residency training.⁵ Subsequent to this, a physician can opt to complete additional research or training in a subspecialty via a two- to four-year fellowship program.

Medical school provides the necessary groundwork, but the medical school graduate is not yet prepared to practice medicine independently. Several more years of direct responsibility for patient care under the guidance of more experienced physicians is required. Residencies therefore have, as their primary purpose, the further education of the newly graduated physician to the level of competence required for independent clinical practice.

Learning medicine at this level necessarily requires direct involvement in patient care; residency therefore comes with a large increase in responsibility. Although general therapeutic plans are derived in consultation with senior physicians, the daily actions of ordering medications, following outcomes of tests, and communicating with patients and their families are the resident's responsibility. These jobs involve essential skills for patient care which the resident must learn and practice many times.

As in medical school, residents must learn to manage a daunting amount of information; the basic process of medical practice, new research, treatment protocols, and new procedures all require ongoing study. Providing better patient care and obtaining better patient outcomes depends on learning and applying this new information. Thus, in addition to "on the job" training, residents spend many hours in lectures, discussion groups (both formal and informal), and journal clubs in order to learn their specialties.

Because medical schools, residency programs, and patient care all depend on the physician's teaching ability, and because teaching often educates the teacher better than does a lecture or a book, all residents must also act as educators. In addition to their other responsibilities, residents must provide lectures and run discussion groups for attending physicians, other residents, and medical students. In many programs, residents provide substantial portions of medical student education during the student's clinical years.

The typical day for a resident depends on the specialty. In most of the teaching hospitals, the

patients are admitted to the hospital under the care of a medical team. A typical team consists of an attending staff physician, a senior resident, one or two first year residents (or interns), and one or two medical students. Each team sees its patients every morning, reviews events of the night before, and makes the plans for the day. These plans include ordering tests, arranging consultations with specialists, performing procedures, and, when appropriate, preparing patients for discharge. Typically, the attending physician meets with the team in the early afternoon to discuss each patient. The rest of the afternoon is spent with unfinished tasks from the morning. Residents also attend educational conferences or meetings on most days.

The medical community provides its services 24 hours a day, 365 days a year. Residents serve as on-site physicians, spending nights in the hospital "on call" for routine and emergent situations, and for the admission and stabilization of patients. Traditionally, an on call assignment lasts for a total of up to thirty-six consecutive hours in the hospital. It is not uncommon for a resident to get little or no sleep during this time.¹⁶ Most programs require their residents to "take call" every second to fifth night, with an average of every third night.¹⁷ The summation of on-call and daily responsibilities often results in over 80 hours a week that the average resident spends in the hospital. (Most specialties, except surgery, are making efforts to limit hours to 80 per week.) Most of this time is spent directly on patient care. Time away from the hospital must be divided between learning from textbooks and journals, and pursuing other personal interests.

For many, the financial concerns of medical school continue on into residency. In 1992, the mean medical school graduate's total debt (including medical and pre-medical loans) for the eighty percent who borrowed was \$55,859. Over 20% of graduates had debt in excess of \$75,000.⁵ These debt levels compare to the average first-year resident stipend of \$28,238 in 1992.¹⁸ Stipends increase by an average of \$1,200 during each additional year of residency.¹⁸

To evaluate the impact of debt on residents, the Group on Student Affairs of the AAMC performed a survey of third-year residents in 1987. At that time, third-year residents received an average stipend of \$28,894 and the mean debt among the 80% of respondents who carried debt was \$41,000. Among the married residents (63%), 44% of spouses carried additional debt resulting in a mean debt for married residents of \$60,868.¹⁹ Debt proved to be a significant burden for respondents with 76% indicating that their stipends were inadequate to meet federal loan obligations. Ninety percent of those having over \$75,000 in debt (11% in 1987), found their stipends inadequate.¹⁹ As a result, three-quarters of third-year residents indicated a need for outside employment and two-thirds were currently moonlighting thus adding to their already long hours.¹⁹

Although most studies have failed to show a strong correlation between debt levels and specialty selection by medical students, there appears to be a stronger correlation among residents. The 1987 study found that debt levels influenced the type of practice planned by 55% of respondents and that 44% of respondents were influenced in selecting practice location. Forty percent indicated plans to subspecialize as a result of their debt.¹⁹

Traditionally, the federal government assisted residents by providing a two years deferment of payments for federally subsidized loans (Title IV Stafford and Perkins Loans). Thus, the third-year residents in the 1987 study had not had to make any payments on their Title IV loans for the first two post-graduate years. Congress has now eliminated these deferrals, except for residents who can demonstrate financial hardship based on a "debt-to-income ratio" which remains to be defined. Medical students are watching this debate carefully. Stipends for first and second year residents are lower than those for senior residents; thus the results of the 1987 AAMC study are of even greater concern to junior residents who will likely have even greater difficulty meeting loan obligations and other living expenses.

Residents wear many hats -- providing essential medical services, ensuring medical coverage for

hospitalized patients twenty-four hours a day, staffing clinics and emergency rooms, and performing many important medical procedures. They are educators, teaching skills to more junior residents, interns and medical students. Most importantly, residents are students, depending on their three to five years in a teaching hospital to provide them with the knowledge and skill necessary to practice medicine.

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