Long-term Outcomes of Primary Care Residency Choice by Graduating Medical Students in One Medical School

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The ratio of primary care physicians to subspecialists is of major importance to the future of American medicine. This study examined the output of primary care physicians by a state-supported medical school that has a goal of placing 50% of its graduates in primary care. Data were obtained from alumni office questionnaires and published board-certification listings for 1102 graduates of the University of Kentucky College of Medicine from 1973 through 1983. Fifty percent of these graduates chose residency training in primary care. Of all 1102 graduates, 37% are categorized as practicing primary care physicians; 29% of the total are board certified in a primary care discipline. Attrition from primary care as an initial career choice at entry into residency was 26%.

With declining medical student interest in primary care and a shortage of primary care physicians, new initiatives in medical education and in the practice of medicine are necessary to balance the specialty distribution of physicians more favorably toward primary care. **J FAM PRACT 1990; 31:411-416.**

The specialty distribution of physicians has profound implications for access to health care and the cost of that care. Tarlov[1] states that "too many subspecialists are being trained and not enough attention is being paid by educators to produce doctors that the users need." Since there is not a national health manpower policy, the specialty distribution of physicians has evolved to reflect the service needs of teaching hospitals, specialty organizations, and interests of students.

The percentage of primary care physicians in the total physician manpower pool has decreased from 37.9% in 1970 to 34.5% in 1984.[2] The Canadian health care system, with 50% of its physicians committed to primary care, spends 41% less per person on health care than the United States. Yet, on the average, health outcomes may be better than those in the United States.[3] This study examined the actual output of primary care physicians from one state-supported medical school committed to producing primary care physicians to determine whether this commitment has significantly affected specialty distribution.

In the 1970s the federal government provided capitation support to medical schools to increase student numbers and to achieve the goal that 50% of graduating medical students would choose primary care residencies.[4] Primary care at that time was defined as general internal medicine, general pediatrics, family practice, and obstetrics-gynecology. While many medical schools subscribed to this goal, the definitions of primary care have been redefined.

The Institute of Medicine report[5] in 1978 listed five attributes of primary care: accessibility, comprehensiveness, coordination, continuity, and accountability. Alpert and Charney[6] suggest that the appropriate functions of the primary care physician are to provide first contact care, assume longitudinal responsibility for health and illness, and coordinate the use of the health care system, especially visits to specialists. Only three kinds of physicians meet all of these definitions and attributes: family physicians, general internists, and general pediatricians.

Two recent publications dramatize the importance of the health manpower issue. The Council on Graduate

Submitted, revised, July 3, 1990.

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Medical Education (COGME) report[7] published July 1, 1988, concluded that "there is an under-supply of physicians in family practice and there appears to be an impending under-supply of physicians in general internal medicine." They also concluded "that the future supply of pediatricians could rapidly become only adequate or even inadequate." A recent article regarding the future of family practice[8] underscored the need and demand for family physicians throughout the country. Consequently, it is appropriate that the outcomes of the medical educational process be examined in terms of physician specialty choice, not just at graduation from medical school but at the conclusion of residency and entry into practice, to determine actual primary care physician output.

The University of Kentucky College of Medicine has subscribed to the goal that 50% of its graduates pursue careers in primary care. A review of first-year residency position choices by graduating medical students would suggest that Kentucky has achieved that goal. The number of graduates who actually became board certified or practice primary care is, however, the real bottom line. To determine the actual output of primary care physicians after completion of their graduate medical education, this study followed physicians who graduated from the University of Kentucky from 1973 through 1983 and chose a primary care discipline at graduation.

METHODS

This study examined primary care specialty choice of University of Kentucky graduates between 1973 and 1983. The starting date of 1973 was chosen because family practice was designated the 20th specialty only 4 years previously, in 1969, and few residency positions were available until the early to middle 1970s. For purposes of this study, students graduating in 1983 will have had time to finish primary care residency training and establish themselves in practice. Students graduating after 1983 may not yet be clearly identifiable by specialty and type of practice.

Graduates from 1973 through 1983 who began programs in internal medicine, pediatrics, and family practice comprise the study population. Data regarding residency choice at the time of graduation was provided by the Dean's Office of the College of Medicine. Subsequent designation of type of practice or board-certification status was obtained from curriculum vitae information regularly collected by the alumni office of the College of Medicine. Alumni reporting a primary care practice in internal medicine, pediatrics, or family practice were added to the study population, regardless of their initial specialty choice at the time of medical school graduation.

TABLE 1. PRIMARY CARE RESIDENCY SELECTION AT GRADUATION (1973–1983)

	Number of Students (N = 1102)	Percent
Residency selection		
Internal medicine	229	21
Family practice	213	19
Pediatrics	109	10
Total primary care	551	50

The most recent American Board of Medical Specialties Compendium of Certified Medical Specialists (March 1988)[9] was consulted to learn the diplomate certification status of each physician in the study population.

The Directory of Diplomates[10] published by the American Board of Family Practice served as an additional reference point for board certification, although the specialty organizations for pediatrics and internal medicine provide no comparable publications. By combining curriculum vitae information supplied by graduates themselves with board certification listings, current specialty status or type of primary care practice is known for 98% of the study population.

For purposes of analysis, individuals whose board certification is in a specialty other than internal medicine, pediatrics, or family practice were not considered to be practicing primary care. Further, physicians certified in a subspecialty of a primary care field were not considered to be significantly practicing primary care. Primary care physicians are therefore defined in this study as those individuals who self-designate their practice in one of the three primary care disciplines or who are board certified in internal medicine, pediatrics, or family practice without subspecialty certification.

RESULTS

The choice of residency for each member of the graduating classes from 1973 through 1983 was tabulated from data provided by the Office of Education of the College of Medicine Dean's Office. Students selecting a residency in internal medicine, family practice, or pediatrics are recorded in Table 1. Twenty-one percent of the graduating students chose internal medicine programs, 19% chose family practice programs, and 10% chose pediatric programs. The total number of graduates opting for a residency in a primary care specialty was 551, which is exactly 50% of the graduating classes (N = 1102) for those 11 years. This number is consistent with the goal of this

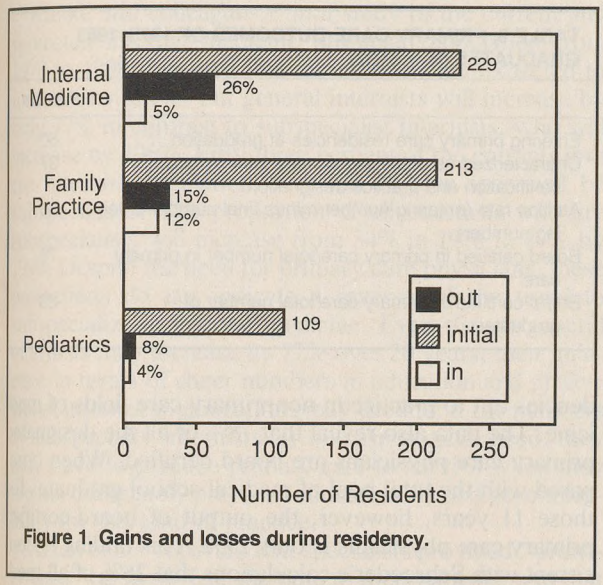

Figure 1. Gains and losses during residency.

College of Medicine that 50% of its graduates enter primary care.

Although the denominators changed, the in-migration and out-migration for each field were relatively balanced. Figure 1 displays the in- and out-migration for each of the primary care specialties after graduation. Internal medicine at 26% had the most out-migration into other areas, with family practice at 15%, and pediatrics at only 8%. In-migration of residents from other disciplines into one of the primary care disciplines was greatest for family practice with 12%, and about equal for internal medicine and pediatrics at 5% and 4%, respectively.

As one might expect, subspecialty certification was greatest among physicians entering internal medicine training. Twenty percent of those entering internal medicine and 15% of those entering pediatrics obtained subspecialty certification. At present no subspecialization certification process exists in family practice. The out-migration from internal medicine results from its role in providing first-year training for such subspecialties as radiology, neurology, psychiatry, ophthalmology, and dermatology. Family practice programs, on the other hand, tend not to accept individuals who are interested in pursuing other disciplines after their initial year of postgraduate training. Those entering pediatrics show the most stability of specialty choice with little loss or gain. There is also a relatively low rate of subspecialization in pediatrics, although this trend may be increasing over the last 5 or 6 years.

The most critical part of this retrospective analysis is the determination of the number of individuals in each discipline who are significantly practicing primary care.

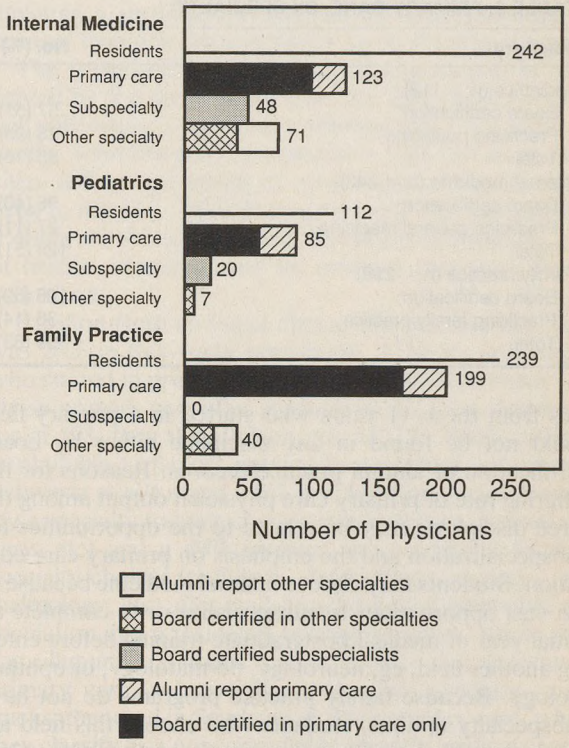

Figure 2. Current status of study population.

Two measures are used to make this determination: board certification in a primary care discipline, and self-reported practice designation to the alumni office. Board certification might be considered the reference standard, but individuals practicing primary care without being board certified must be counted because of the differential in board fail rates. Also, personal variables may have influenced the availability and length of time spent in residency and, thus, board eligibility.

Figure 2 and Table 2 illustrate the differences and similarities among the three disciplines. Using the criteria of both board certification and practice designation, pediatrics is in the middle with a 51% board certification rate and 76% total primary care output. Internal medicine had the lowest number of primary care physicians with a 40% board-certification rate and 51% of entrants practicing primary care. Family practice had a 69% board-certification rate and an 83% primary care output, which is the highest of all three primary care disciplines.

The numbers reflect all those graduates who chose one of the primary care fields initially plus those who migrated into each area from another specialty. Only 2% of gradu-

TABLE 2. PRIMARY CARE, BY SPECIALTY

Specialty	No. (%)
Pediatrics (n = 112)	
Board certification	57 (51)
Practicing pediatrics	28 (25)
Total	85 (76)
Internal medicine (n = 242)	
Board certification	96 (40)
Practicing general medicine	27 (11)
Total	123 (51)
Family practice (n = 239)	
Board certification	166 (69)
Practicing family practice	33 (14)
Total	199 (83)

ates from these 11 years who started in a primary field could not be found in any discipline either by board certification or alumni practice records. Reasons for the differing rate of primary care physician output among the three disciplines may be related to the opportunities for subspecialization and the emphasis on primary care education. Students may choose internal medicine because of the vast opportunities to subspecialize or to complete an initial year of medical postgraduate training before entering another field, eg, neurology, dermatology, or ophthalmology. Because family practice programs do not have subspecialty options, students who choose this field are much more likely to finish the primary care training unless they simply transfer (17%) to another totally different field of medicine. People choosing pediatrics are less likely to subspecialize or transfer than their internal medicine counterparts (24% compared with 49%), and pediatrics attracts fewer transfers from other disciplines after medical school graduation.

Family practice programs are designed to emphasize primary care and ambulatory education. Greater emphasis on inpatient care and tertiary education is found in most pediatric and internal medicine programs. In some of these settings primary care residents and their education have low priority, compared with the high-technology inpatient subspecialty divisions. Perceptive medical students who are truly interested in primary care education may thus preferentially select family practice because of the design and goals of its residency education programs. This selection bias may help explain why family practice has the greatest output of primary care physicians.

As shown in Table 3, 551 graduates (50%) entered primary care residencies initially, and 407 (37%) can be categorized as practicing primary care using both board certification and practice designation as criteria. An attrition rate of 26% can be calculated by dividing the difference between the entrance pool and finishing pool by the entering number. Thus, a little over one quarter of all graduating medical students entering primary care residencies opt to practice in nonprimary care fields of medicine. The data also reveal that 78% of all the designated primary care physicians are board certified. When compared with the total pool of medical school graduates for those 11 years, however, the output of board-certified primary care physicians is only 29%. This finding is consistent with Schroeder's calculations that 26% of all medical school graduates are now in primary care training.[11]

TABLE 3. PRIMARY CARE OUTCOMES OF 1973–1983 GRADUATES (N = 1102)

	Percent
Entering primary care residencies at graduation	50
Characterized as practicing primary care by board certification and practice designation	37
Attrition rate (entering number minus final number/entering number)	26
Board certified in primary care/total number in primary care	78
Board certified in primary care/total number of graduates	29

DISCUSSION

The accuracy of these data may be questioned because they are not based on individual questionnaires sent to physicians in their current practice location. Questionnaire data would likely be incomplete and still might not accurately reflect primary care activity in a given physician's practice. Instead, this report is based on board-certification status as recorded in the American Board of Medical Specialties Compendium, and practice designation self-reported to the alumni office. The American Board of Medical Specialties obtains its data directly from the certifying boards of all the specialties. Only 2% of the graduates could not be characterized by type of practice or board-certification status. These individuals were dropped from all calculations except the basic denominator of 1102 graduates.

Interesting supportive data come from a study done by Cluff[12] of his own internal medicine graduates from the University of Florida School of Medicine. Forty percent of his internal medicine graduates were considered to be general internists in a primary care practice setting. His figure is identical with the results of this study in which 40% of individuals choosing internal medicine training became board certified in general internal medicine. This comparative information suggests that those individuals board certified in general internal medicine are spending a significant portion of their time in primary care and that this group of internal medicine residency graduates can be expected to become primary care physicians.

Kletke and colleagues,[13] in a study of the current and projected internal medicine physician population from 1978 to 1998, reported that all internists are expected to increase by 121%, but general internists will increase by only 77% in contrast to subspecialist internists, who will increase by 206%. Fifty-three percent of the entrants into the internist population over the 20-year span will be subspecialists. The proportion of all internists who are subspecialists will increase from 34% in 1978 to 47% by 1998. Despite the need for primary care physicians, these projections do not indicate a reversal of the trend to subspecialize in internal medicine. Even though general internists may increase by 77% over 20 years, their influence in terms of sheer numbers in education and professional internist organizations may decline. If the numbers of subspecialty internists far outstrip societal need, they may have to practice primary care to survive when they are not adequately prepared educationally and psychologically for this kind of practice.

Aiken et al[14] reported that specialists provided "primary care" up to 30% of the time to their patients, and that one in five Americans receives general care from a specialist. This information must be taken into consideration when considering the primary care capacity of the total physician pool. While these data are valuable, they may not reflect the true primary care capacity of specialists if measured over the years as people age and problems change. Although accurate data are hard to obtain, a significant number of individuals board certified in internal medicine and pediatrics have taken 1 or more years of subspecialty fellowship training but have never become subspecialty certified. They are capable of practicing specialty care, which would reduce their actual amount of time and effort devoted to primary care. Both of these phenomena are sources of error but may cancel each other out. Specialty care provided by primary care physicians and primary care delivered by specialists need to be reevaluated. Furthermore, subspecialty training today does not prepare physicians educationally to practice primary care in an optimal fashion. Specialists may not provide primary care in a cost-effective manner and are not geographically distributed appropriately to meet primary care needs. These facts further minimize the contribution of subspecialists to first-class primary care.

In another study carried out in 1978 in the state of Massachusetts, Wechsler et al[15] asked in a questionnaire survey whether "individuals were devoting more than half of their practice to primary care." Twenty-eight percent of former residents in internal medicine and 50% of former residents in pediatrics reported devoting a majority of their practice time to primary care. This information is again consistent with the data from Kentucky. Although board certification does not guarantee that an individual practices primary care, it is the best measure of the probability that an individual is highly qualified and likely to be devoting a significant proportion of time practicing the primary care discipline in which he or she was trained.

The importance of this kind of information is highlighted by the controversy over the GMENAC report,[16] not only when it was first published but even more recently. Schwartz et al[17] concluded in 1988 that many large cities will have a deficit of most types of subspecialists even in the year 2000. They concluded that subspecialty training should be expanded. Physician distribution, cost of health care, and need for primary care were barely addressed.

Attrition from an initial choice of a primary care field was 26% in this study population. If all the individuals who started in primary care (551) are added to those who chose primary care after graduation (42) for a denominator of 593, then the attrition rate is 31%. While attrition attributable to factors previously described is expected, Schwartz et al[18] noted a 9% loss for noncontrollable lifestyle specialty training choices (primary care, general surgery, etc) and a 40% increase in controllable lifestyle specialty choices (radiology, dermatology, urology, ophthalmology, etc) after medical school graduation and matriculation into a residency training program. While their data illuminate students' career choices that encompass primary care, subspecialty, and other specialty career tracks, the trend is clearly away from primary care, which they classify as a noncontrollable lifestyle medical career.

The drop in fill rates of the internal medicine match in 1987 and the family practice match in 1988 are two events that focus concern on the numbers of primary care physicians now being trained to be available to meet health needs in the future. These match results indicated a declining interest in the two areas of medicine that have produced the greatest number of primary care physicians in the past. Additionally, Schroeder,[11] in an article entitled "The Making of a Medical Generalist," calculated that 27% of current physicians are involved in primary care and 26% of physicians in training are in primary care resident positions. Using the American Association of Medical Colleges' graduation questionnaires, the Medical College Admission Test questionnaire, and the recent match events in internal medicine and family practice, Colwill[19] projects a drop in student interest in primary care from 36% in 1982, and 29% in 1987, to 17% in 1991 if current trends continue. The COGME report,[7] recommendation number 12, urged that more students be encouraged to enter training in primary care, particularly in family practice and general internal medicine.

Although 50% of the graduates of the University of Kentucky College of Medicine chose a primary care field for their graduate medical education, only 37% are practicing primary care more than 5 years after graduation, and only 29% of the total graduates are board certified in

a primary care discipline. This output will not significantly alter the physician specialty distribution that exists today. A majority of medical schools, and especially those in private institutions, are not committed to increasing the primary care physician manpower pools. Consequently, the imbalance in physician specialty distribution is likely to persist and worsen.

CONCLUSIONS

As the data in this paper demonstrate, a medical school commitment to primary care does not necessarily result in a significant improvement in the output of primary care physicians. One of the reasons given for the relative success of the Canadian health care system, which costs 41% less per person and results in better overall health outcomes, is the markedly increased ratio of primary care physicians to specialists.[20,21]

How does one change specialty distribution in this country? Petersdorf[22] notes that "fewer subspecialists and more general physicians are needed." He suggests that change in physician specialty distribution be accomplished by altering the medical payment system and through governmental influence on residency training positions.

Given the data in this study and the national concern about specialty distribution, a change in the distribution of physicians by specialty cannot occur without fundamental changes in the medical education system, an altered system of reimbursement that values cognitive services, and a national health manpower policy that is focused on the funding and distribution of residency training positions.

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