The Modern Medical School Graduate and General Surgical Training

Are They Compatible?

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In the August 1987 issue of the New England Journal of Medicine, Dr McCarty referred to the soaring number of unmatched internal medicine residency spots as “Black Tuesday.”¹ Now, nearly 15 years later, general surgery is facing the same dilemma, as the number of unmatched categorical positions has increased 10-fold in the last 4 years, and more than 100 vacant positions are anticipated in the 2002 match (Figure 1).² A multitude of changes in the demographics and desires of graduating medical students, coupled with a relative lack of change in surgical training programs, have forever changed the applicant pool from which general surgery departments recruit their trainees. As a result, the number of applicants to general surgery programs has decreased by 30% in the last 9 years, and there are no data to suggest that this trend will stop (Figure 2).² The decreasing number of applicants to general surgery training programs may reach critical proportions unless corrective action is taken.

The student of today is a sophisticated consumer with unparalleled access to information. Internet sites, such as http://www.salary.com and a variety of publications give the student immediate access to information such as physician salaries and call and vacation schedules. This allows the student to know what the benefits and drawbacks of each discipline in medicine are before the application process begins, so programs may have less of an opportunity to try to market themselves to students.

A closer look at the student, the training program, and the faculty of today may yield some insights into why the interest in general surgical training is diminishing.

THE STUDENT

Gender and Age

The number of men in the total applicant pool to medical school has decreased from 28,414 in 1974 to 13,517 in 1999—a 52% drop; meanwhile, the number of women graduating from medical school has steadily increased to a point at which they comprise nearly 50% of graduating students today (Figure 3 and Figure 4).³⁴ Despite these changes in gender demographics, general surgery has been and remains a white male–dominated profession in that only 10% of practicing general surgeons in 1998 and 21% of categorical general surgery residents in 2000 were women.⁷⁻⁹ Therefore, general surgery is appealing to predominantly half of the students it used to before the gender shift. Using a survey study, Gabram et al¹⁰ recently found that female surgical residents are significantly more concerned than men about child rearing issues, initiating and maintaining personal relationships, maternity leave, and promotional advancement.¹⁰ Similarly, other studies have shown that 36% to 96% of female medical students believe that surgery is discriminatory to their sex, and 50% feel out of place on a surgical service.¹¹⁻¹² Many of these concerns stem from a lack of role models and the lack of time and opportunity for life outside of the hospital that general surgeons are perceived to have.

There is an underlying assumption that the entering medical student is older, and the argument has been made that given the duration of surgical residency, the “older” student would be less likely to pursue a career in surgery. In fact, there has not been a change in the mean age of medical students in the last 10 years. On average, both men and women are approximately 24 years old on entry into medical school.⁷

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Therefore, age probably does not play a role in the decreasing interest and applicant pool to general surgery.

**Ethnicity**

The number of underrepresented minorities such as African Americans, American Indians, and Hispanics applying to and graduating from medical school has increased from 2890 in 1974 to approximately 4181 in 1999 (Figure 4). Surgery, however, remains a white-dominated specialty. Persons from underrepresented minority groups filled approximately 9.3% of all categorical general surgery training positions in 1994. There are no recent data on the number of categorical general surgery residents from underrepresented minority groups; however, only 10% of categorical and preliminary surgery residents combined were members of such groups in 2000. This lack of minority role models in academic departments of surgery may contribute to the lack of interest in general surgery by underrepresented minorities.

**Generation X**

The medical student today has significantly different lifestyle demands and goals than students from prior decades. Because this is the tenth generation of the century, many refer to those born since 1965 as Generation X. As a whole, this generation wants autonomy, a flexible schedule, and a lifestyle that allows protected time for friends and family. Keeping work and life separate and balanced is becoming increasingly important to young professionals. Traditionally, this has been especially important to women, but it is now becoming increasingly important to men as well.

The frequent call schedule and the many years of in-house call to which most surgical residencies adhere may turn students away from this profession. In fact, it was not until 1995 that general surgery programs were forced to move from every-other-night call to a less rigorous call schedule. To substantiate this desire to control their lifestyle, survey data were obtained from 116 of 150 graduating medical students at George Washington University School of Medicine (GWUSOM). The third-year surgery clerkship at GWUSOM is the highest rated clinical rotation and the second highest rated course in the entire curriculum per student evaluation data; yet less than 10% of the graduating class, on average, chooses to study general surgery. Seventy-five percent of the students surveyed cited an overly regimented call schedule, length of training, or poor lifestyle of general surgeons as reasons why they chose a field other than general surgery. Only 15% of the students noted a lack of interest in surgical diseases as a reason why they did not enter this field (S.E., unpublished data, 2001).

**Debt**

There has been an extensive discussion in the literature of how financial pressures drive student decision making, but the data are not clear. The median debt of medical students graduating from private and public medical schools has increased 300% since 1985 and was $110000 and $80000, respectively, in 1999 (Figure 5). Williams et al have reported that debt is a significant factor in a medical student's choosing surgery over internal medicine. Moreover, many internet sites, such as http://www.salary.com, post survey data on physician income and are frequented by medical students who want to compare incomes across various disciplines and in various locations. Although no data describing usage of such Internet sites exist, it is certainly probable that students are influenced by this information. In a study of 20 specialties, performed across 6 years, Dorothy Andriole, MD, and her colleagues found there was...
meanwhile, application rates of other surgical specialties, who rank general surgery in their rank-order list for the primaries, is seeing its training fellowships become much less competitive than they were 10 years ago, and this is probably due, at least in part, to the grueling lifestyle.2 Furthermore, for the past 3 years, there have been fewer than 7 unmatched orthopedic or urologic residency spots per year, while general surgery has experienced continuing increases in its unmatch rate.5

Despite these changes, Andriole et al found that general surgery remains competitive (lower match rates for US seniors) compared with primary care (written communication, November 2001). However, this may change if the number of qualified US senior applicants for categorical general surgery positions continues to decline while the number of general surgery positions offered in the match remains unchanged or increases.

One key difference between the surgical residencies that are still being filled and other surgical specialties is the amount and frequency of in-house call. Most urology, otolaryngology, and orthopedic training programs allow their upper-level residents to take call from home, whereas most general surgery residents have to spend at least 4 of 5 years in the hospital every third or fourth night, and, as previously mentioned, many were on every-other-night call until 1995. Numerous fourth-year medical students look on this long road very unfavorably and are turned away from general surgical training due to this fact alone.

General surgical training has long been perceived as having a tough, regimented, inflexible, and occasionally intimidating atmosphere. Students are primed to be aware of this demanding environment before they start their surgical clerkships, and they compare this to fields that are “kinder and gentler.” Generation X does not subscribe to the regimented, hierarchical thinking that marks surgical training to the same extent as those before them did. Both the American College of Surgeons and American Board of Surgery have responded to this perception in their recommendations for a “mutually supportive” environment between attending physicians and residents, in which residents are “treated with respect and dignity.”22,23

THE FACULTY MENTOR

Any vocation enhances its recruitment through the use of mentors. Such persons demonstrate the benefits of the field, provide role models the trainees can emulate, help the trainees become established in the field, and most importantly, demonstrate the enjoyment and energy that the discipline affords. This is certainly important in recruiting minorities and women to surgery. Because of the paucity of female and minority general surgeons, most female and minority medical students have white male mentors, and this may discourage many female and minority medical students from pursuing training in general surgery.5

The poor exposure of medical students to the lifestyle of a practicing general surgeon may be a significant association between mean income of physicians practicing in the specialty and competitiveness of the specialty for US seniors in their match process (written communication, November 2001). Competitiveness was defined as the number of US seniors matched to positions divided by the number of US seniors who applied.

The high income of some groups, such as that of orthopedic surgeons, may be one of the factors that explains why the number of applicants to those residencies has always remained high. However, financial drive alone is certainly not the final answer in career decision making. Medical students today are sophisticated enough to take into account both the salaries and the work and stress of each field in medicine. Fields that allow for a comfortable lifestyle and time for family and friends will naturally be more attractive to Generation X. For example, cardiothoracic surgery, with its high-end salaries, is seeing its training fellowships become much less competitive than they were 10 years ago, and this is probably due, at least in part, to the grueling lifestyle.

THE PROGRAM

Since 1992, the number of graduating medical students who rank general surgery in their rank-order list for the match has decreased from 1380 to 961—a 30% decline; meanwhile, application rates of other surgical specialties such as orthopedics have remained relatively stable (Figure 2).2 Similar data evaluating only categorical general surgery applications do not exist prior to 1992, so it remains uncertain if this is a cyclical event or a new phenomenon. The current move away from general surgery is not simply a move toward primary care training or residencies with shorter training periods. Family practice is experiencing a significant decrease in its matching rate, and for the past 15 years, the percentage of residency spots in both family practice and internal medicine that were filled by US medical students parallels that of general surgery.5

Figure 4. Number of medical school applicants by gender and minority status, 1974 to 1999.

Figure 5. Median indebtedness of graduating medical students, 1985 to 1999.
cant problem in attracting medical students to general surgery. Both the quality and quantity of student exposure to general surgery has decreased. Past studies had shown that interest in the field was one of the strongest factors that motivated students to apply to general surgery. This single factor was more important than debt burden or lifestyle considerations, yet surgeons at most institutions are no longer involved in teaching the first- and second-year medical students, and surgical clerkships have been shortened by almost 30%. As such, students may not develop an accurate appreciation for the myriad general surgical issues that may interest them. Furthermore, there is not enough time to introduce the lifestyle of a general surgeon both in the office and hospital settings to many medical students. Often, students spend nearly all of their time with residents in the hospital and develop an inaccurate sense of the time and level of acuity required for patients seen in practice. They grow to believe that waking up at 4 AM and leaving the hospital at 8 PM is the norm for all surgeons. Few have the opportunity to shadow a practicing surgeon to see a broader view of what the practice is like.

Surgical programs in which staff are enthusiastic and support autonomy and the ability to think freely are significantly more likely to attract medical school graduates. In a survey study of 210 graduating medical students at 3 US medical schools, Williams et al found that support of autonomy by instructors was a significant factor in students’ choosing surgery over internal medicine. Furthermore, in a letter to the editor, Tunkel comments that students are attracted to fields in which instructors are energetic and motivated.

In an editorial in the New England Journal of Medicine, Kassirer noted that 33% of physicians were either somewhat dissatisfied or very satisfied with medical practice. The stresses of academic practice often manifest in the advice that medical students receive from their mentors. In lieu of emphasizing the joys of general surgery, medical students are often told of the mandatory trauma call, poor reimbursement, medicolegal issues, and managed care pressures. No data exist to suggest that academic surgeons are more disgruntled with medical practice than other physicians, but it is clear that any level of surgeon dissatisfaction can have a detrimental effect on highly impressionable medical students.

CONCLUSIONS

The medical student body of today bears no resemblance to the one of 25 years ago. The number of graduating female medical students and minorities has increased substantially, yet general surgery has failed to attract this large subset of graduates. Additionally, today’s students have different goals and expectations and a wealth of information regarding all aspects of training and practice at their fingertips. They are less willing to sacrifice lifestyle and family time for training and work and are able to directly compare various disciplines and incomes. Furthermore, as student debt burden continues to increase, it is possible that consideration of future income may become an increasingly important factor in how students decide which specialty to pursue. Finally, owing to a variety of pressures and financial constraints, faculty in general surgery may be inadvertently portraying a negative picture to the medical student who is perceiving the field as an outsider.

As the demographics and needs of graduating medical students continue to change, all surgical residency programs must look introspectively to see how they can meet the needs of the graduates without compromising their rich heritage and quality of care. Only in this way can general surgery training programs continue to attract the best and the brightest graduating medical students.

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