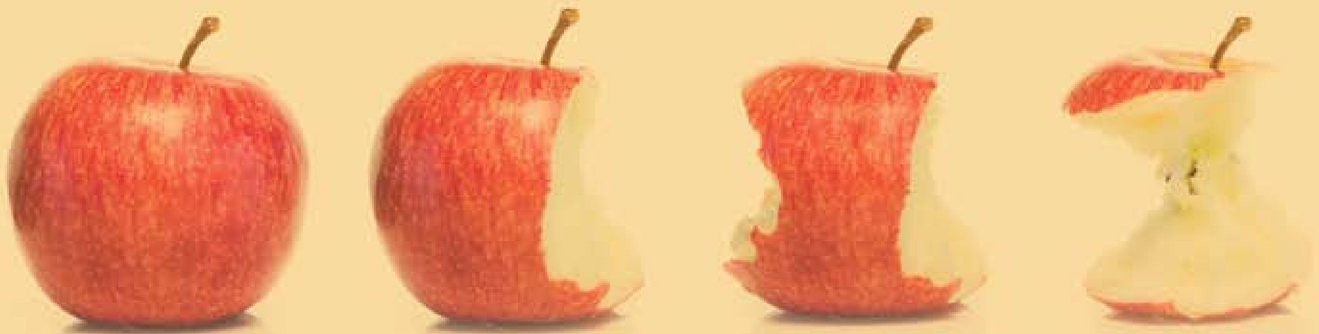
# General surgery training and the demise of the general surgeon



Consider the following hypothetical family: The Williams family, from a U.S. town of 25,000 people, has been fortunate to have health insurance and thus access to good health care. They have always felt that they have two "family docs," as they like to put it.

First is Dr. Smith, who is board certified in family medicine. He looks after Grandma's arthritis and Grandpa's hypertension and diabetes. He helps Mr. Williams with his chronic low back pain and Mrs. Williams with her routine gynecologic needs. He cares for Joey and Janey when they have a sore throat or an ear infection. Finally, Dr. Smith ensures the entire family's health maintenance through routine screening and annual physicals.

However, the Williams family has another "family doc." Dr. Jones removed Grandma's gallbladder when she had biliary colic and did a right hemicolectomy when Grandpa had colon cancer. He fixed Mr. Williams' inguinal hernia and biopsied Mrs. Williams' breast for a suspicious lump. Dr. Jones also performed Joey's emergency appendectomy and removed a lipoma from Janey's thigh. The entire family considers Dr. Jones—a board-certified general surgeon—their other "family doc." They can't imagine life without him; he is essential for their good health and well being.

In the U.S. today, families like the Williamses are increasingly unlikely to find surgeons like Dr. Jones. Their primary care providers, like Dr. Smith, are often unable to refer their patients locally for common surgical interventions such as hernia repairs, soft tissue biopsies, and cholecystectomies. The imminent demise of the general surgeon has been a growing concern for the medical community and the general public, both who fear an end to a once robust medical

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discipline and its consequences for patients with general surgical problems.

In November 2007, Josef Fischer, MD, FACS, sounded an alarm among physicians nationwide with his commentary, "The impending disappearance of the general surgeon," published in the *Journal of the American Medical Association*.[1] Dr. Fischer described the general surgeons who care for approximately 54 million Americans in rural and small urban areas as "essential to the provision of adequate health care." He noted that the reasons for the "disappearance" are multiple, including fewer graduating surgical residents pursuing general surgery as well as less favorable working conditions and less lucrative reimbursement for practicing general surgeons. Indeed, as can be gleaned from Dr. Fischer's extensive bibliography, the medical literature is replete with research on the workforce challenges facing general surgery.

The general public has also been made aware of this impending public health crisis in which patients with common surgical problems will not have access to general surgeons to treat them. In February 2008, *USA Today* published an article entitled, "Shortage of surgeons pinches U.S. hospitals." The article highlighted a coastal Virginia hospital where only two general surgeons are available, down from seven in the past, because surgeons there are moving or retiring. The hospital, which was started to treat the "simple ills such as appendicitis" of its local people, may no longer be able to carry out its mission because of a shortage of surgeons.[2]

Clearly the general surgery community is at a crossroads. Changes must be made if the field is going to continue to live up to its promise of providing basic surgical care to those in need. Although legislative issues regarding reimbursement and malpractice premiums are a burden that must be addressed with aggressive lobbying and public information, in this issue of the *Bulletin* dedicated to the training of surgeons, we will explore the degree to which general surgery training programs are failing to meet societal needs for general surgeons, why they are no longer providing their graduates with the clinical competence and technical skills to function as broad-based general surgeons, and how they are effectively shunting their graduates into subspecialties.

## Supply and demand for general surgery

Approximately 1,000 general surgery residents complete their training each year. Surveys indicate that only 30 percent to 40 percent of these graduates will practice general surgery.[3,4] Almost 33 percent of the 17,243 practicing general surgeons in the U.S. (according to a 2005 estimate) are contemplating leaving practice within five years.[5,6] Meanwhile, the demand for general surgeons in the U.S. continues to increase, with the number of general surgery positions rising during the second half of the academic year, when most chief residents should already have a job.[4] Furthermore, the population of general surgeons has been stagnant, relative to overall population growth.[6] The predicted growth of the U.S. population, in combination with an aging baby boomer generation that will hit the peak age for many common surgical illnesses by 2020,[7] will exacerbate current workforce issues. Since many practicing surgeons in the U.S. are nearing retirement age or opting for early retirement because of unfavorable working conditions, it seems the discrepancy will only worsen without a compensatory increase in graduating residents pursuing general surgery.

Nowhere is the discrepancy of more concern than in rural communities where an estimated 55 million Americans (17% to 25% of our population) live.[8] The number of general surgeons per population of 100,000 is 4.67 in small or isolated rural areas, compared with 6.53 in urban areas and 7.71 in large rural areas.[6] Studies have confirmed geographic differences in caseloads between rural surgeons who perform a greater variety of procedures and urban surgeons who often have a much narrower scope of practice. The bulk of this difference can be attributed to the greater volume of endoscopic procedures performed by rural surgeons compared with their urban counterparts. However, rural surgeons also perform routine orthopaedic, otolaryngologic, gynecologic, and urologic procedures that are rarely performed by urban surgeons because of the availability of specialists in those areas.[9]

A recent survey of rural surgeons found that many believe that their general surgery training did not provide enough exposure to subspecialties outside of general surgery, such as orthopaedics and gynecology.[5] Because the majority of gen-

eral surgery trainees "learn surgery" at urban or large suburban hospitals, lack of exposure to the professional and personal benefits and challenges of rural surgical practice is a major factor in the unmet need for general surgeons in rural communities.

Although a variety of internal factors may or may not inspire graduating chief residents to pursue general surgery careers, regionalization is an external force that is making it more difficult for those few who do want to be general surgeons to perform a wide range of surgical procedures. Regionalization has delegated certain procedures that were traditionally performed by the local general surgeon to general surgery subspecialists at tertiary hospitals.[10] Analyses of volume outcome relationships have suggested that certain major procedures are best delivered at high-volume centers where subspecialists will generally perform them.[11-15] Proponents of regionalization argue that specialized centers and high-volume providers have better outcomes. Payors have followed suit and often, even if patients might choose to have a procedure performed by their local general surgeon, reimbursement will not follow. As a result, today's general surgeons have a narrower scope of practice compared with previous generations. Yet, local emergency rooms are still largely staffed by these same general surgeons, which forces us to question whether emergency cases will be met with the same level of expertise as in previous eras. In addition, if there are no general surgeons available in isolated areas, the impact of longer transport times before surgical treatment remains to be determined.

## Challenges to adequate training

Many residents have heard stories of the "old days" when a typical surgeon's operating room (OR) schedule included a colectomy, a carotid endarterectomy, an open lung biopsy, and a mastectomy—all in a single day. Many attribute this impressive array of cases to the 120-plus-hour week invested in general surgical training in years past. However, as surgical knowledge and practice have advanced, it has been increasingly difficult to arm the graduating resident with every acquirable skill in a five-year training period, irrespective of the number of hours spent in the hospital. With the advancement of technology within what was traditionally the general surgery arena, the training of a general surgery resident no longer encompasses only what is accomplished with a scalpel. As a result, surgical training has increasingly obligated the "new" general surgeon to find a niche of expertise. The training of general surgeons has been further challenged by duty-hour regulations and billing/coding regulations that have at once deprived the surgical trainee of important surgical opportunities and the freedom to mature as an independently operating surgeon.

The true impact of the American Council of Graduate Medical Education's (ACGME) 80-hour workweek restriction is hard to quantify. When surveyed, 56 percent of 41 residents reported that they have to abstain from operating post-call because of the 30-hour rule (which states that residents may not work more than 30 consecutive hours, with the final hours allocated only for patient sign-out and/or educational activities).[16] Conversely, other surveys have found that the total operative experience of graduating general surgery residents based on their ACGME operative case logs has not been affected despite the changes in work hours; this outcome has been attributed to strategies such as the implementation of physician assistant coverage, home call, and night float coverage.[16,17] Moreover, the inaccuracy of work-hour logs may cloud the real effect of the restrictions. In a survey of 125 residents, 85 percent reported at least one violation of the restrictions, with greater than 30 percent exceeding it by six or more hours. Of those reporting violations, 48 percent admitted underreporting them to their program director.[18]

Although the 80-hour limitations may or may not adversely affect the acquisition of operative experience and clinical skills, it is clear that resident autonomy has been a casualty of modern surgical training. In years past, chief residents ran the surgical services; they scheduled cases and assigned staff in the OR. They were in essence junior partners to their more senior attendings with whom they developed a strong relationship that consisted of mentorship and trust. Chief residents had a great deal of autonomy and many were able to take their junior residents through cases, with minimal direct supervision from attending staff. As a result, chief residents emerged from

their training prepared for independent practice. Today, however, a surgical procedure will not be reimbursed unless the attending surgeon is scrubbed in for the "critical portions" of the procedure, and in some cases the operative note has to be dictated by the attending surgeon in order to be reimbursed.[19]

Lack of autonomy, possibly worsened by the limitations of the 80-hour workweek, means that many clinical situations are not encountered until after finishing training and entering practice. It is not difficult to understand, then, that even individuals who were entertaining the idea of a broad general surgery practice frequently change their minds and decide to obtain additional training in order to develop a more manageable clinical niche. Currently, defining oneself as a surgeon based on a specific disease process (such as surgical oncology), body system (such as endocrine surgery), or anatomic area (such as breast surgery) is easier than defining oneself as a general surgeon adept in a variety of disease processes, body systems, and anatomic areas. Arguably, the depth and breadth of skills and clinical experience necessary for the latter are lacking in modern-day general surgery training.

## Allure of subspecialization

The majority of general surgical trainees in the U.S. obtain their training at academic institutions providing tertiary care. Along with the onslaught of new knowledge and technologies during residency come interactions with surgeons who have mastered them by subspecializing in disciplines such as surgical endocrinology, surgical oncology, hepatopancreaticobiliary surgery, colorectal surgery, vascular surgery, and thoracic surgery. It is not uncommon for academic surgery departments to have divisions for each of these subspecialties. In addition, subspecialty-trained surgeons who have individually narrowed their scope of practice often staff the general surgery division itself. It is within these subspecialty divisions, rotating among them monthly, that the modern-day surgical resident trains to become a general surgeon.

This begets the question, where are the broadly trained general surgeons who will mentor residents? Most commonly, the major interaction with such surgeons occurs at community hospitals. For university-affiliated training programs, these hospitals provide residents with an opportunity to work with nonspecialized surgeons. However, these experiences are often shorter in duration and not consistent enough to garner a mentor-mentee relationship. Role models do have an impact on career choices, and a majority of residents choose the same specialty path as their self-selected mentor.[20] Without exposure to an adequate number of general surgeons during training, finding a mentor in this field may be impossible.

The subspecialization of surgeons, with the recruitment of these individuals to training programs as teachers and mentors, is leading to what may become a neverending cycle with a continual decrease in general surgeons. Current data suggest that 70 percent of general surgery graduates pursue subspecialty training.[21] Since 1984, there has been a 25 percent decrease in graduates of general surgery programs who have chosen to practice as general surgeons.[22]

The addition of primary certification in certain subspecialties will only further decrease the pool of residents available to the general surgeon career path. Plastic surgery was one of the early adaptors of abbreviated training programs, but others have now joined them. The American Board of Surgery has passed regulations that would allow residents to "double count" their first year of fellowship training toward their final year of general surgery residency. These individuals would then be board eligible in general surgery and vascular or pediatric surgery. The current stipulation in place is that all of the training must be at the same institution.[23] It seems likely that general surgery training programs will continue to lose trainees to subspecialty tracks because of the appeal of truncated training and other perceived benefits of subspecialty careers.

A driving force behind the allure of subspecialization for general surgery graduates is the health care market itself. Increased competitiveness in the workforce and increased payment for subspecialists are both factors that could sway a trainee. In addition, surgical subspecialists often do not take part in emergency or trauma call, which further highlights the lifestyle benefits these surgeons receive. In fact, emergency department call itself, which in the past was the purview of the general surgeon, is now being developed into yet

another subspecialty, alternatively called emergency surgery or acute care surgery. This further highlights the segmentation of what we currently know as "general surgery."

These same free-market factors could also ultimately help general surgery, in that current health care projections forecast a deficit of surgeons.[22] This outcome would mean that areas that rely on broad-based surgical care, such as rural locations as previously discussed, might need to pay a premium to recruit staff. This could lead to an increase in interest among graduates looking to optimize their salary.

## In sum

To those individuals who are not resigned to view general surgeons as a dying breed: What, then, is our solution? The dwindling breadth of cases and the decreasing autonomy for chief residents has left many graduates feeling inadequately prepared for general practice.

As discussed, some programs now offer rural surgery electives or rural surgery fellowships as a means to recruit and train surgeons for practice in remote regions. These fellowships impart the lifestyle experience of rural general surgery while also focusing on pathologies and cases that may no longer be a part of traditional, university-based residency training. Proponents of specialized rural surgery tracks have recommended that a special designation be given to programs offering them, which will aid medical students in identifying programs that meet their expectations.[24] Reports from these programs not only suggest that their graduates are more likely to practice in rural settings, but also that job satisfaction among their graduates has increased.[25]

Similar to rural surgery electives, international electives provide another means of broadening clinical experience while also promoting volunteerism for underserved areas abroad. Such rotations expose residents to a wide array of general surgical problems often not encountered in modern western surgical practice. Residents experience first-hand how such problems are diagnosed and treated with limited resources and under austere circumstances. A survey of residents who rotated internationally found that they were exposed to a broader scope of pathology, were challenged to be more resourceful, and were taught to rely more on physical examination skills.[26]

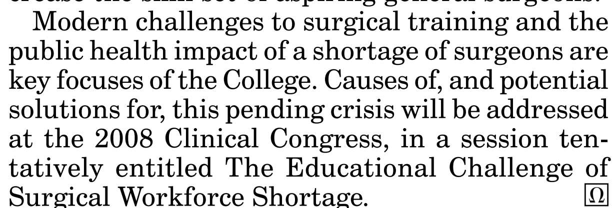
In an age when both advancing medical science and regulations on medical training have reduced real-life opportunities for surgical experience, simulators may play a role in educating broadly skilled general surgeons. The promise of technology in advancing skills in newer minimally invasive surgical techniques is obvious and improvement in operative performance after simulated laparoscopic training has been well documented.[27,28] However, virtual reality methods may prove even more promising by giving residents opportunities to gain "hands-on" experience in open cases that are infrequently performed today thanks to advances in medical management (such as ulcer surgery) and surgical technology (such as open cholecystectomies). Although these newer training techniques will not be able to impart clinical judgment, they will be critical for equipping graduating general surgery residents with the technical skills to handle such uncommonly encountered scenarios should contemporary approaches fail.

Providing residents with off-site opportunities to further their training in broad-based general surgery—whether in rural America, abroad, or via simulators—has been challenging because of ACGME duty-hour restrictions and residency salary structure. Residency programs are struggling to provide coverage of their core hospitals with an 80-hour workweek. Moreover, funding for rotations away from a residency's core hospitals is also an obstacle because resident salaries are tied into Medicare/Medicaid funds that are distributed based on a resident's presence at a particular institution. Despite these constraints on time and financial considerations, leaders in surgical education recognize that training is paramount.

Accordingly, surgical educators have undertaken innovative and rewarding solutions that will likely spread to general surgery residencies throughout the country. Hopefully these improvements in surgical training will bolster the recruitment, and moreover the retention, of medical students interested in broad-based general surgery careers. However, further incentives are needed. The compensation disparity between general surgeons and subspecialists must be narrowed to retain new graduates who have an ever-widening array of subspecialty paths to pursue. Policymakers should

consider loan forgiveness programs for general surgeons willing to practice in areas with greater need, similar to those that have been implemented for primary care physicians. Broad-based general surgery mentors should be made available to all surgical trainees at some point during their training so that they can experience the challenges and rewards of what might otherwise be a dying field.

To avert this pending crisis in U.S. health care caused by a shortage of general surgeons, Cofer has suggested that the Residency Review Committee expand the number of slots in those residency programs that have made the effort to promote and sustain broad-based general surgery training.[4] The Blue Ribbon Committee on Surgical Education—a collaborative effort between the College, the American Surgical Association, and the Resident Review Committee on Surgery—formed in 2002 and has recommended a "modular" surgical training format in which a basic surgery core is followed by specialization in general surgery or the varied subspecialties.[29] This approach may increase the appeal of general surgery by reducing the length of training, through the elimination of subspecialty electives that neither interest nor increase the skill set of aspiring general surgeons.


Modern challenges to surgical training and the public health impact of a shortage of surgeons are key focuses of the College. Causes of, and potential solutions for, this pending crisis will be addressed at the 2008 Clinical Congress, in a session tentatively entitled The Educational Challenge of Surgical Workforce Shortage. Ω

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