



Impact of fellowships on surgical training

by **Keith D. Amos, MD, Houston, TX**

Historically, surgical training programs emphasized a broad-based curriculum to train residents to pursue a variety of career paths without additional surgical training.¹ The majority of program graduates entered practice directly after completing primary surgical training. However, over the last 15 years, an increasing number of surgery residents have chosen to pursue fellowship training after completing general surgical training. Since 1992, the proportion of general surgeons pursuing fellowship training increased from more than 55 percent to more than 70 percent.² Why are surgical residents choosing to lengthen their training when surgical leadership debates the pros and cons of truncated training and early specialization? The factors driving this paradoxical trend and its effects on surgical training warrant discussion.

Depending on the surgical program setting, 40 percent to 90 percent of chief residents choose fellowship training.³⁻⁶ The decision to pursue an additional one to three years of subspecialty surgical training often occurs before internship. A survey of fourth-year medical students interviewing for categorical general surgical training positions over a two-year period at The Johns Hopkins School of Medicine indicated that 93 percent of the applicants intended to pursue fellowship training.⁷ Contrary to the rising cost of medical education, 92 percent of these applicants indicated that debt did not affect their choice of specialty.⁷

The proliferation of fellowship training is not limited to general surgery. Of the more than 600 residents who complete orthopaedic surgery each year, more than 60 percent enter into fellowship programs of some kind.⁸ In otolaryngology, there are more than 150 fellowship positions listed for approximately 265 residency program graduates each year.⁹ The number of surgical subspecialty fellowship positions continues to increase even though programs in urology, orthopaedics, and otolaryngology have shortened the previously required one or two years of general surgery training.

The progressive subspecialization of surgery has significantly affected the career choices of trainees in many ways. Surgeons with narrowed practice areas have provided the broad-based experience of modern general surgery training. Medical students and surgical residents are trained predominantly by faculty with limited areas of surgical practice. Student surgical clerkships and resident rotations are commonly defined by practice area such as breast, hepatobiliary-pancreatic, and minimally invasive surgical services. Some residents perceive that additional training will provide more attractive job opportunities. Residents also perceive that surgeons with specialized training and fellowship training credentials are more likely to succeed in academic surgery. With these focused experiences, students and residents make career choices and select surgical role models based on these narrowed practice areas. Ultimately, trainees want to be considered as experts in their chosen field of practice.

Acknowledging this trend leads to questions about how such training demands shape both current and future structures of general surgery training programs.

Surgical training and medical practice

Over the last two decades, there has been a rapid expansion of knowledge in medical science. The proliferation of information technology has not only aided the medical community, but it has allowed our patients to become more informed about their medical problems. Now, patients demand specialized care and better outcomes. In response to these and other forces, the advent of minimally invasive techniques has decreased morbidity

and shortened hospital stays. Acceptance of such techniques has led to the establishment of fellowships in minimally invasive, endovascular, and radiosurgery. Furthermore, financial and lifestyle pressures associated with trauma surgery have led to recent proposals to establish a fellowship in acute care surgery—the surgeon’s version of the hospitalist. Recently, what has been historically known as “general surgery” has become the subject of a new fellowship established for rural surgery. According to Malcolm M. E. Johns, MD, these changes have affected medical practice as follows:

The usual response to new developments in medicine is to create new specialties, which trainees can generally pursue only after completing a traditional residency program. This may lead to a form of “fellowship fetishism,” where everyone has to attain the latest credential. Regardless of the general or specialty focus, residency training is treated (and residents often experience it) as if it were a term of service or servitude rather than of learning and achievement.¹⁰

Skill set acquisition

General surgery programs are providing graduates with adequate skill sets to practice without acquiring further training. Approximately 30 percent of the individuals who complete a general surgery residency do not seek additional fellowship training and practice general surgery safely and well. Ultimately, most of these graduates will practice in a community setting performing a mix of open gastrointestinal procedures, breast, trauma, hernia repairs, vascular access, and basic/advanced laparoscopic procedures. It is certainly not necessary for everyone to pursue advanced training, but whether program graduates have competence in these essential practice areas must continue to be addressed.

Fellowships and surgical training programs

Surgical training is a balance between service, experience, and education. Although the Residency Review Committee (RRC) of surgery develops accreditation standards and reviews accredited program for compliance, all surgical training programs are not equivalent in service or operative volume. Therefore, experience in

diagnosis, operative skills, and management of complications in complex surgical cases will vary among programs. All training programs will not be “centers of excellence” in each area of surgery. It has been argued that it is irrelevant if the average general surgery residency does not produce competence in several advanced areas and that the resident will be best trained in those procedures and diseases in which the program has the best educational experience.¹¹ The problem with this argument is that many residents change career paths during residency.

Fellowships also allow trainees to fill voids in residency training and to develop a high level of knowledge in one area rather than limited knowledge in many areas. A graduate of a program known for expertise in a certain area would not have needed to do a fellowship 30 years ago. However, that has changed. The criteria for academic excellence in surgical specialty areas have been expanded to include an expectation of fellowship training.

General surgery programs should not be adversely affected by the presence of advanced trainees in fellowships. Residents in programs without fellowships are often concerned about a negative impact on their training if a new fellowship position is planned; they worry that certain types of operations will be performed only by fellows, thus diluting the resident’s operative experience.¹² Although the RRC in surgery mandates that chief residents and fellows should not be placed on the same service, fellows do compete with general surgery residents for number and quality of cases. But residents should not be relegated to surgical assistants if a fellow is present.

A fellowship must have a positive effect on a surgical training program. Fellows should be integral in the education of residents. Jay L. Grosfeld, MD, FACS, describes the value of a fellowship to a training program as follows:

Many post-graduate fellows, because of their experience, provide a high level of quality care and play a role in teaching junior-level residents and students assigned to their service. The general surgery residency program provides the resident manpower and support structure for the fellowship and does much of the less-gratifying

legwork. In theory, as long as a facility has an adequate case volume for both the fellow and the general surgery residents, and the fellowship does not interfere with the general surgery residents training experience and continuity of care issues, the [two] can coexist.¹³

This coexistence must be carefully monitored to ensure that the resident’s education is not compromised. The residency and fellowship directors must also work together closely to prevent these issues.

The expansion of fellowship training does suggest the urgent need to redesign surgical training. More than 60 percent of all U.S. medical schools have undertaken significant curricular revision during the last decade.¹⁴ Graduate medical education has been much slower to evolve. The most significant changes have been duty hour limitations and longer training times in most medical disciplines. In 2004, Carlos A. Pellegrini, MD, FACS; Andrew L. Warshaw, MD, FACS; and Haile T. Debas, MD, FACS, proposed a scheme for restructured surgical training.¹⁵ Everyone interested in surgical education should take time to read the *Surgery* article written by these well-known surgical leaders. This design uses a modular system for surgical training. First, all surgical residents would be required to complete a basic surgery core module (learning basic surgical skills with a national curriculum), which would take two to three years. The resident would then be allowed to graduate to the advanced modules of surgery or a research module after competence in the basic module is verified. Completion of the advanced surgery module would then lead to board certification. Resistance to such a sweeping change is understandable, but these ideas must be evaluated in pilot programs to improve how training is conducted.

The value of the fellowship

Obviously, fellowship training allows trainees to obtain a mastery of skills and knowledge in a specific area beyond that developed in residency. Fellowship also provides the opportunity to emulate the diagnostic and treatment approaches of several faculty role models as trainees develop their own practice style. There is evidence that

fellowship training enhances career satisfaction. In a study of surgeons in academics, surgeons who completed fellowship training expressed greater career satisfaction and had fewer concerns about professional confidence as compared to those who did not complete fellowships.¹⁶

On a personal note, I am in my ninth year of training and in the second year of a surgical oncology fellowship at The University of Texas M.D. Anderson Cancer Center in Houston, TX. Participating in a fellowship has enhanced my ability to evaluate and comprehensively recommend treatment for complex cancer patients. I have been exposed to a high volume of patients with rare tumors such as sarcoma. I have developed collegial relationships with co-fellows and important mentoring relationships with faculty. The fellowship has also offered opportunities to participate in laboratory and clinical research experiences to provide a foundation for a future in academic surgery. In retrospect, this experience has certainly been of great benefit.

Conclusion

There are multiple factors that drive residents to pursue fellowship training. Medicine will continue to undergo significant change, and we should not limit our profession by allowing the lengthening of training to be our primary response to improving surgical education. We must be willing to reform graduate medical education and not allow surgical training programs to become a conduit for fellowship training. Although there are numerous benefits to fellowship training, we can no longer educate by the old mentality of: "See one. Do one. Teach one." □

References

1. Cheadle WG, Franklin GA, Richardson JD, et al. Broad-based general surgery training is a model of continued utility for the future. *Ann Surg.* 2004;239(5):627-632.
2. Stizenberg KB, Sheldon GF. Progressive specialization within general surgery: Adding to the complexity of workforce planning. *J Am Coll Surg.* 2005;201(6):925-932.
3. Ko CY, Whang EE, Karamanoukian R, et al. What is the best method of surgical training? *Arch Surg.* 1998;133(8):900-903.
4. Warshaw AL. Restoration, not preservation, of general surgery residency. *Arch Surg.*

- 1993;128(3):265-268.
5. Maier RV. To be or not to be? *Surgery.* 1992;112(2):121-129.
6. Barnes RW. The next generation of surgical residencies. *Arch Surg.* 1990;125(4):433-436.
7. Hardacre JM, Chen H, Martin C, et al. General surgery and fellowship training: Opinions of surgical intern applicants and fellowship directors. *Surgery.* 2000;127(1):14-18.
8. Garfin SR. Editorial on residencies and fellowships. *Spine.* 2000;25(20):2700-2702.
9. Medina JE. Tragic optimism vs learning on the verge of more change and great advances: Presidential address, American Head and Neck Society. *Arch Otolaryngol Head Neck Surg.* 2001;127(7):749-755.
10. Johns MME. The time has come to reform graduate medical education. *JAMA.* 2001;286(9):1075-1076.
11. Ferguson CM. The arguments against fellowship training and early specialization in general surgery. *Arch Surg.* 2003;138(8):915-916.
12. Rattner DW, Apelgren KN, Eubanks WS. The need for training opportunities in advanced laparoscopic surgery. *Surg Endosc.* 2001;15(10):1066-1070.
13. Grosfeld JL. General surgery and fellowship training: Mutually beneficial or competing entities? *Surgery.* 2002;132(3):526-528.
14. Barzansky B, Etzel SI. Educational programs in US medical schools, 2000-2001. *JAMA.* 2001;286(9):1049-1055.
15. Pellegrini CA, Warshaw AL, Debas HT. Residency training in surgery in the 21st century: A new paradigm. *Surgery.* 2004;136(5):953-965.
16. Anderson KD, Mavis BE. The relationship between career satisfaction and fellowship training in academic surgeons. *Am J Surg.* 1995;169(3):329-333.

Dr. Amos is a fellow in surgical oncology at The University of Texas M.D. Anderson Cancer Center, Houston, TX.

