

With the exceptions of the 80-hour work-week's introduction in 2003 and the elimination of the "training pyramid" in the 1980s, the structure of general surgery training programs has changed little since the days of William S. Halsted. Under the auspices of the Accreditation Council for Graduate Medical Education and the Surgical Residency Review Committee, the specific requirements regarding numbers and types of operations have changed over the years, but the overall training paradigm, introduced more than a century ago, has remained unaltered.

The current model, based on a five-year core training period, has been remarkably successful in training surgeon-scientists and clinicians for generations. With an emphasis on equality, this model ensures that all graduating

chief residents fulfill standardized minimum requirements, have similar case logs, and are exposed to the full breadth of general surgery. Particularly over the past 20 years, however, although residency structure has remained fixed, the stakeholders in surgical education have all changed dramatically. As I will discuss, the patients, residents, faculty, health care system, and even the field of surgery itself are no longer reminiscent of their century-old counterparts. As a result, and despite the outstanding history that residency training has had, I believe that the time has come to consider change. Our system, so effective in the past, is an outdated model and is lacking in its ability to promote professionalism, mentorship, and preparedness for the realities of practice in the 21st century.

Increasingly, and in various ways, residents



**From the Chair
of the RAS-ACS:**

*Surgery residency training:
The time for change has come*

by Jacob Moalem, MD

are stating that the current residency structure inadequately satisfies their needs. Despite enormous financial, familial, and social pressures, an increasingly high number of graduating chiefs defer becoming an attending and prolong their training by pursuing fellowships.¹ Moreover, despite the grueling nature of residency, many senior residents consider the current hours limitations to be a serious barrier to their education and would appreciate the opportunity to work beyond 80 hours per week when educational opportunities arise.²

A different world

Burdened by an average educational debt of more than \$200,000 and represented by an equal number of women and men, medical students and residents themselves have changed over the years. They have a strong sense of the importance of work-family balance and autonomy, yet desire mentorship, leadership skills, and opportunities for volunteerism.^{3,4} They are also eager to emerge into the workforce after having spent their youth in school and in residency. In a survey of surgical residents, only 15 percent of 319 respondents agreed with the statement, "I would be willing to add a year to my residency if it meant I could work shorter hours."⁵ Despite this telling result, many residents do at least one year of research during residency, and 80 percent do a fellowship at its conclusion. Thus, for many graduating medical students, the initial five-year commitment is extended to eight years or more, their emergence to practice delayed until their mid- or late 30s, and their educational loans are inflated as a result of the power of compounding of interest.

Older and sicker than ever before, the average inpatient is also different from who was the average inpatient when our current residency structure was conceived. As length of stay for surgical procedures has progressively decreased, and as outpatient services have improved, there are almost no inpatients of low acuity. Octogenarians, once exceedingly rare on a surgical service, now represent a large subset of our patients; with their multiple comorbid conditions and propensity for imperfect outcomes, they are among the most challenging patients to care for. Far more savvy and educated, today's patients are also increas-

ingly demanding of specialty care and less likely to identify individual residents on the team as their doctor. They are also less trusting and willing to accept physicians' orders and recommendations at face value.

Perhaps more than the patients and residents, the health care environment itself has completely changed over the past several years. Gone are the days of resident autonomy, when entire operations were done unsupervised by faculty. As regulation has tightened, so have the burden of documentation and the required knowledge of billing and coding—critical facets of medicine that are generally not taught in residency—increased. As oversight and scrutiny into individual surgeons' outcomes continue to increase and become public, faculty's incentive to allow residents meaningful participation in operations and care decreases. This trend is exacerbated by the decreased availability of residents, whose prime directive is to comply with hours regulations.

The past several years have also witnessed an explosion of surgical technology and innovation. Entire specialties have been born; laparoscopic, endovascular, and endoscopic procedures have become standard; and other minimally invasive approaches continue to be developed and refined. Each of these changes requires the understanding of a different physiology, the acquisition of a different set of technical skills, and the mastery of a different vocabulary, far beyond that which was traditionally associated with general surgery training.

Because of the changes previously discussed, the demands on today's surgical residents are greater than ever. As more and more knowledge and skill areas are incorporated into the curriculum and contact time with faculty is reduced, the pressure builds. Patients are sicker and more demanding, and regulatory demands have burgeoned. Moreover, with an increasing reliance on cross-coverage systems, residents' familiarity with patients and the educational benefit of each case have decreased, as has their personal investment in patient care. Educators have observed the development of a shift-work mentality among junior residents and a decrease in their professionalism and ownership of patients.⁶ In my opinion, this trend is a direct result of our current rules, which prohibit residents from providing the longitudinal

care they wish to and forces them to sign out to colleagues whenever their shift is over.

New structure for residency training?

I believe that we must modify the existing residency structure in order for surgery training to remain relevant and attractive to graduating medical students. Although some authors have advocated a competency-based model of progression, I do not believe that that model addresses many of the challenges I have outlined. An early differentiation program, however, as proposed by the American Surgical Association's Blue Ribbon Panel,⁷ might be more effective. By providing all residents with basic surgical core training during the first two years and then allowing them to differentiate into tracks, this new model would allow for more focused and improved educational opportunities for residents, and for enhanced instruction and mentorship by faculty.

Under this new paradigm, residents would be able to better master the technical and perioperative details of the procedures that they are most likely to actually do when they emerge into practice, and many might feel less compelled to pursue fellowship training. Residents would benefit from increased contact time with their mentors who, in turn, would be more motivated to teach and mentor the residents who have committed to their field of specialty. With the decreased breadth of exposure, continuity of care for patients would improve, and residents' increased involvement in the care would foster a heightened sense of responsibility and professionalism. The slightly decreased scope of exposure would also allow for the introduction of a specialty-specific curriculum in ethics, regulatory requirements, and financial implications of treatment decisions—all integral elements of practice that currently are not commonly taught.

In summary, although the current residency paradigm has produced and continues to produce surgeons who receive excellent training, the price that current residents pay to achieve competence for independent practice is too high. Presently, graduating residents in surgery routinely invest 15 years or more in training and education and make enormous financial, familial, and social sacrifices. As a system, we must make better use of the limited work hours that we are allotted to

train our residents by focusing their exposure to the specialties in which they will practice and by limiting their experience in operations that are less related to their specialty of choice. □

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References

1. Borman KR, Vick LR, Biester TW, Mitchell ME. Changing demographics of residents choosing fellowships: Long-term data from the American Board of Surgery. *J Am Coll Surg*. 2008;206(5):782-788.
2. Moalem J, Salzman P, Ruan DT, et al. Should all duty hours be the same? Results of a national survey of surgical trainees. *J Am Coll Surg*. In press.
3. Cherr GS, Moalem J, Dayton MT, et al. Young surgeons' attitudes regarding surgery and professional organizations. *Am J Surg*. 2009. In press.
4. Powell AC, Casey K, Liewehr DJ, et al. Results of a national survey of surgical resident interest in international experience, electives, and volunteerism. *J Am Coll Surg*. 2009;208(2):304-312.
5. Whang EE, Mello MM, Ashley SW, Zinner MJ. Implementing resident work hour limitations: Lessons from the New York State experience. *Ann Surg*. 2003;237(4):449-455.
6. Hutter MM, Kellogg KC, Ferguson CM, et al. The impact of the 80-hour resident workweek on surgical residents and attending surgeons. *Ann Surg*. 2006;243(6):864-871.
7. Debas HT, Bass BL, Brennan MF, et al. American Surgical Association Blue Ribbon Committee Report on Surgical Education: 2004. *Ann Surg*. 2005; 241(1):1-8.

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