



New ways of practicing surgery: *Alternatives and challenges*

by **Mecker G. Möller, MD, Tampa, FL;**

Luis A. Santiago, MD, Tampa, FL;

John Karamichalis, MD, London UK;

and **Joshua M.V. Mammen, MD, Cincinnati, OH**

Throughout history, the field of surgery has been shaped by social, cultural, and economic forces. However, in recent years, its evolution has been aimed at expanding service access, improving patient outcomes, and reducing cost. In an era of global competitiveness and rapid flux of information, physician groups and training programs must mold their organizational models and curricula, respectively, to the demands of today's surgical practice.

Volunteer surgeons

The U.S. Census Bureau has estimated that some 44.8 million Americans are currently uninsured.¹ Despite great technological advances in medicine, lack of access to health care continues to have calamitous implications for underserved populations, especially in developing countries.

Many active and retired American surgeons have committed to volunteering as part of their practice of surgery. These brave surgeons and residents deal anonymously with the myriad logistics of missionary work and often travel at their own expense.

The noble crusade of Keith Harmon, MD, comes to mind. As a third-year surgery resident at Michigan State University in Grand Rapids, he spent his vacation time in Viet Nam in collaboration with a local surgeon. Dr. Harmon dedicated many weekends to raising money for the purchase of wheelchairs for Vietnamese amputees. He continues to be an inspiration for young residents who are enlightened by the stories of his missionary trip.

Not surprisingly, surgery residents involved in volunteer work often continue this practice throughout their careers. Surgical residents at the University of California at San Francisco (UCSF) may already enroll in an elective volunteerism rotation in a developing country. In fact, an overwhelming majority of participants claim a satisfactory experience.² Similarly, residents at New York University may choose a training track in international surgery.³

Volunteerism demonstrates its value as an essential building block in the formation of future surgeons across international boundaries.^{2,4,5} It comple-

ments the resident's training by exposing him or her to a broad pathology spectrum, sometimes necessitating innovative surgical approaches in the absence of sophisticated technology. Working in the context of limited resources nurtures the volunteer's intellectual growth, compassion, and understanding of surgical practice worldwide.

In his "From my perspective" editorial in the March 2007 *Bulletin*, Thomas R. Russell, MD, FACS, Executive Director of the American College of Surgeons, shares his experience during a medical mission in Haiti.⁶ Dr. Russell reminds us eloquently of why we chose a career in surgery and urges us to honor the noble roots of our profession.

The ACS recognizes and supports volunteer surgeons who offer their services to underserved communities around the world. In this spirit, it has created Operation Giving Back (OGB). This organization manages a Web site that has become a valuable resource for surgeons interested in volunteer work.⁷ It currently lists 34 American organizations offering international volunteer opportunities for U.S. surgical residents and 20 organizations with domestic volunteer opportunities. The experience gained in these appointments promotes an enhanced understanding of the disparities and similarities of the daily practice among surgeons domestic and abroad.

The OGB Web site also contains links to several university programs and organizations such as Robert Wood Johnson Medical School, University of Arizona, University of Massachusetts, University of Washington, University of Wisconsin, the Association of American Medical Colleges, the Global Health Education Consortium, and several other foundations that provide scholarships, fellowships, and information about funding for students, residents, and physicians interested in volunteerism and global health. In a recent survey, OGB asked about the types of volunteer work that are most interesting to surgeons. Among respondents, 55 percent indicated an interest in international clinical surgery; 20 percent in international teaching, and the remainder in domestic volunteer opportunities.⁷

In a 2006 article in the *New England Journal of Medicine*, Adam Wolfberg, MD, MPH, Fellow of Maternal-Fetal Medicine at Tufts-New England Medical Center, comments that it does not suffice for a surgeon to visit a foreign country once a year

with the mere intent of performing hundreds of surgical procedures.⁸ It is also extremely important to share knowledge with those local physicians who will ultimately care for patients once the missionary surgeons leave. Operation Smile is one example of cross-integration of knowledge. Each year, this program invites surgeons from developing countries to the U.S. for surgical training.

Policies and legislation across the nation are being proposed to legally protect surgeons who are involved in volunteer work. In 1997, Congress passed the Volunteer Protection Act, legislation that provides immunity from tort claims that might be filed against volunteers with not-for-profit organizations, contingent on the organizations carrying adequate levels of general liability insurance.⁹ In this regard, Volunteers in Health, a not-for-profit organization, has created a guide for volunteer physicians to better understand the intricacies of this legislation.¹⁰

Notwithstanding the possibility of malpractice lawsuits, surgeons continue to step up, volunteering their skills and knowledge in caring for distressed patients in all corners of the world. Recent examples include the rescue and treatment efforts following the catastrophes of Hurricane Katrina in 2005 and the Asian tsunami in 2004.

Kathryn Anderson, MD, FACS, FRCS, during her 2005 Presidential Address, "Crises in humanity," to the Fellows of the American College of Surgeons, encouraged physicians to get involved in volunteer works, especially in the wake of medicine's recent industrial revolution. In her lecture, she pointed out that by giving of ourselves, we are not only giving of our time and heart, but we are also receiving the rewards of the greatest humanitarian profession.¹¹

Surgeons as innovators

New approaches and technologies continue to push the envelope in what can be achieved in surgery. For instance, mini-laparotomies have managed to substitute for large, painful, and disfiguring incisions, while advanced laparoscopy and robotics have further minimized the need for mini-laparotomies. Likewise, endovascular and angiographic tools and a new generation of medications are putting the scalpel to rest.¹²

Surgeons are active contributors to emerging technologies, as some of them dedicate time away from their regular practice to collaborate in designing new surgical tools. Other surgeons get involved in research to improve the current technology.

One example of recent surgical innovation is natural orifice transendoluminal endoscopic surgery (NOTES). The Natural Orifice Surgery Consortium for Assessment and Research (NOSCAR) is a collaboration of the American Society for Gastrointestinal Endoscopy and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), dedicated to the development of NOTES. The interest in this minimally invasive technology was so great that the 2007 NOSCAR conference was fully booked a few days after registration opened. Even though endoscopic approaches have been used for years, the report of a transoral appendectomy by D. Nageshwar Reddy, MD, FRCP, DSC, and G. Venkat Rao, MS, MAMS, at the Asian Institute of Gastroenterology in Hyderabad, India, drew the attention of surgeons and journalists alike. The media storm was even greater when Marc Bessler, MD, at the College of Physicians and Surgeons of Columbia University in New York reported a transvaginal cholecystectomy on a 66-year-old woman. The NOTES field continues to progress with surgeons at the forefront.

Scientific and technological advances continue to shape medical decision making. For example, anti-peptic ulcer procedures have become second-line therapy after medical treatment. Likewise, the maze procedure has revolutionized the treatment of atrial fibrillation and is preferred over medical therapy for a group of selected patients. Furthermore, more patients are undergoing Roux-en-Y gastric bypass procedures for treatment of morbid obesity. In California, for example, the number of Roux-en-Y gastric bypass procedures alone increased from 887 in 1995 to 13,637 in 2003.¹³ Other advances have improved patient outcomes in areas where surgery was once thought to be contraindicated. For example, a combination of chemotherapy with debulking is now considered standard of care for mucinous appendiceal cancer.¹⁴ More commonly, colon adenocarcinoma metastatic to lung or liver is considered for surgical resection.¹⁵

Surgeons as constant educators

Fundamental to the existence of any discipline is the ability to transmit both time-tested traditions and new innovations to a new group of pupils. The model advocated by William S. Halsted, MD, has been the basis for surgical education as well as education in other medical disciplines. However, a host of scientific and educational changes have led to a reevaluation of the current model, which has retained some of the original Halsted elements but has lost others as well. In the particular, the ideal of graduated responsibility based on readiness or competence of the trainee (that Dr. Halsted initially advocated) is being resurrected.

Several surgical societies have taken the lead in creating a competency-based surgical model. SAGES developed the fundamentals of laparoscopic surgery program, a prime example of a competency-based model.¹⁶ The organization continues to devote efforts not only in the implementation, but also in validation of this educational model.

The academic study of surgical education has truly grown over the last several years. Surgical Education Week—a collaboration of the Association for Surgical Education, the Association of Program Directors in Surgery, and the Association of Residency Coordinators in Surgery—brings together a variety of disciplines to address the challenges of surgical education. The number of publications focused on surgical education continues to climb with nearly twice as many articles published in the last five years as were published a decade ago. Furthermore, another sign of the current times may be the name change of the journal *Current Surgery* to *The Journal of Surgical Education*.

Telepresence and telementoring

Advances in digital communication, especially the progress made in the transmission of real-time media, have facilitated the implementation of training sessions for novice surgeons in remote areas.^{17,18} Thus, telepresence and telemonitoring permit the instruction of nouvelle surgical procedures by an expert surgeon while guaranteeing the highest level of care and safety for patients. The National Aeronautics and Space Administration

and the U.S. Department of Defense continue to invest financial resources in technology, which would allow a surgeon in a base station to operate on an astronaut in outer space or a wounded soldier in the battlefield. The same technology potentially could be imported to civilian life in order to assist surgeons in remote locations or underprivileged countries with emergent or complex surgical procedures. It is arguable that “remote preceptorship has always been difficult to implement due to the inefficient use of the expert surgeon’s time.”¹⁹ However, an experienced surgeon may choose a career in real-time consultation services from a remote site. Meanwhile, the novice surgeon may benefit from these services by receiving immediate, needs-based training from experienced surgeons without having to travel long distances.

It is foreseeable that telesurgery, assisted by a remote interface, will not only foster long-distance training but will also facilitate direct intervention by surgeons who are not physically located at the patient’s bedside. In fact, the use of telesurgery is already supported by multiple feasibility studies. Results show that total anesthesia time in robot-assisted procedures is either comparable or slightly shorter than in conventional procedures. Furthermore, complication rates and outcomes are similar in both approaches; however, in robotic surgery, there is the added benefit of a stable camera platform, three-dimensional imaging systems, increased degrees of freedom, and improved ergonomics for the surgeon.¹⁹ Nonetheless, as more capabilities are added to robotic arms for increased dexterity and haptic feedback, greater data transmission rates will be required to make surgical procedures appear fully virtual.

The use of telepresence and telemonitoring breaches the gap between the uniform surgical training of yesteryear and the ever-evolving needs of a served population. This problem becomes tangible in the case of remote communities that have limited access to health care and that are served by surgeons who have not retrained in the latest therapeutic modalities. In this sense, exploiting media communications may improve the surgeon’s technical skills and ultimately facilitate service access. Unfortunately, the high cost of a reliable communication infrastructure remains a handicap for many underprivileged regions.

Surgeons, the written word, and the media

Writer surgeons

Although surgeons have historically demonstrated talent as writers, nowadays more surgeons write about subjects beyond the scope of clinical practice. Some are also novelists, storytellers, and social and political commentators. Their books and opinions have traditionally had a significant impact on how society perceives the surgeon’s arduous vocation and strong sense of mission. However, most recent writings depart from the portrayal of the stoic surgeon with nerves of steel to that of a sensible physician who shows heightened respect for life. In turn, this new attitude allows the public to identify with the courage, humaneness, and sensibility that have characterized surgeons in many difficult historical scenarios.

Many of us recall H. Richard Hornberger, MD, an Army surgeon who served as a war correspondent during World War II (who also wrote under the names W. C. Heinz and Richard Hooker). His collection of experiences was published in *When We Were One: Stories of World War II* (Cambridge, MA: Da Capo; 2007 [reprint edition]) and *MASH: A Novel About Three Army Doctors* (New York: Harper Perennial; 1997 [reprint edition]). The latter was adapted for a movie and the popular television series and became part of America’s culture and heart.

Richard Karl, MD, FACS, chairman of the department of surgery at University of South Florida College of Medicine, has delighted and inspired us with his book, *Across the Red Line: Stories from the Surgical Life*. Dr. Karl has also written for the *St. Petersburg Times* and is a contributing editor and monthly columnist (“Gear Up”) to *Flying*.

Richard E. Sall, MD, a general surgeon specializing in occupational medicine, has published a fictional novel *Straightjacket*, and other nonfiction books of social impact such as *Strategies on Workers Compensation* and *Behind the Union Curtain: The Battle between Union Workers and Company Doctors*.

Atul Gawande, MD, FACS, has published a few fascinating books, *Complications: A Surgeon’s Notes on an Imperfect Science* and *Better: A Surgeon’s Notes on Performance*. He also writes for *Slate* and *The New Yorker*.

Other fine examples of current publications by surgeons include *The Making of a Surgeon in the 21st Century*, by Craig A. Miller, MD, a board-certified vascular surgeon; *Mortal Lessons: Notes on the Art of Surgery*, by Richard Selzer, MD, a retired assistant clinical professor of surgery at Yale University; *When the Air Hits Your Brain*, by Frank T. Vertosick, Jr., MD, a neurosurgeon; *Hot Lights, Cold Steel: Life, Death, and Sleepless Nights in a Surgeon's First Years*, by Michael J. Collins, MD, an orthopaedic surgeon; and *Daktari: A Surgeon's Adventures With the Flying Doctors of East Africa*, by Thomas D. Rees, MD.

Embracing the media

Surgeons working as media consultants are increasing public awareness about important health care issues such as malpractice reform. For instance, recall the restrictions placed on residency work hours after the Libby Zion malpractice case was made public in New York.²⁰ Following the fatal outcome of this 18-year-old Bennington College undergraduate, allegedly after a surgical intern failed to diagnose a sepsis syndrome and pneumonia secondary to a tooth extraction and/or a drug-to-drug interaction, training programs were compelled to reevaluate the level of supervision of surgical residents and to limit work hours. Even though lawyers and mainstream media were the first to present this case for public scrutiny, it was physician reporters who brought insight into how close expert supervision of medical residents is crucial in arriving at a timely diagnosis, especially in potentially life-threatening scenarios where patient histories and clinical findings are clouded by inconclusive information.

Several surgeons and physicians contribute to newspapers and provide televised interviews in their areas of expertise. A well-known example is Sanjay Gupta, MD, a neurosurgeon and medical correspondent for CNN who reports on medical news worldwide. In the midst of today's hype and sensationalism over glamorous surgical makeovers performed on television, it is extremely important that the public receives objective information about the risks and benefits of surgical procedures from qualified medical advisors, especially from surgeons themselves. In this sense, public awareness must be raised about recent developments in

surgery and their potential outcomes, especially in an era of heightened expectations of the medical profession. Most importantly, the way a case is presented through the media may alter public opinion overnight.

Broadcasting accurate, evidence-based medical information to the general public in lay terms has been incorporated into surgical practice and is welcomed by patients. Discussing the available treatment options and their potential risks and benefits empowers patients to choose the treatment that better suits them. In this manner, keeping patients well informed avoids false expectations, improves patient satisfaction, and protects physician trustworthiness even in the face of complications.

Surgical practice and legislation

American surgeons live in a litigious society that demands rigorous technical standards and minimal margin for error.²¹ In view of the ever-present risk of perioperative complications, surgeons are forced to disburse considerable amounts of money in malpractice insurance in order to protect their ability to practice.

Some surgeons may be reluctant to abandon high-risk procedures, but the possibility of a lawsuit and its catastrophic consequences may deter them from helping the sickest of patients. It is likely that adopting such a defensive attitude may take some of the joy away from surgery.

It is imperative that surgeons become knowledgeable of their state and federal laws regarding health care. Not only should they be aware of

Dr. Möller is a surgical oncology fellow at Moffitt Cancer Center at the University of South Florida, Tampa. She is Co-Chair of the RAS-ACS Communications Committee and the International Medical Graduate Committee.



liability issues but also of national health policy issues such as Medicare reform, managed care policies, and service reimbursements. The latter elements potentially affect career satisfaction, financial solvency, and, ultimately, service availability. Medicare fee reimbursements have declined consistently for the past 20 years despite inflation and rising costs of surgical practice. Caring for the Medicare population and the uninsured population has become a financial burden for many surgeons. As a result, some surgeons have relocated their practice, and whole communities have been left without surgical services. The ACS has already presented this problem to Congress. In September 2006, Dr. Russell addressed the House Energy and Commerce Committee Subcommittee on Health regarding Medicare physician payments.²²

Surgeons must be aware of the restrictions imposed by the managed care model in order to have a successful practice. Unfortunately, some restrictions jeopardize the traditional surgeon-patient relationship by limiting the amount of diagnostic studies, procedures, and referrals that a patient is approved for. Consequently, it has become crucial to hire staff that is knowledgeable of the potential pitfalls and perils of this business model.

Surgeons as policy consultants

Alternatively, some surgeons have made a career out of representing the interests of other fellow surgeons. These guardians keep a watchful eye on how hospital budgets are allocated, how insurance reimbursements are processed, and how hospitals

implement health care policy. Even though the surgeon's time is primarily dedicated to patient care, a surgeon working as a full-time representative ensures that the guild's needs and point of view are always considered.

In some private settings, the board of directors includes all the partnering doctors in addition to other administrative staff. Although this inclusion strategy may seem a bit extreme, the point is made that appointing surgeons with a master's degree in business administration to key positions inside the hospital administration makes sure the surgeons' collective voice is heard.

At a national level, there are 11 physicians who are members of the 110th U.S. Congress. Of those elected physicians, two are Fellows of the College: Charles Boustany, MD, FACS (R-LA); and Tom Price, MD, FACS (R-GA). And in the 109th Congress, the Senate majority leader was Sen. Bill Frist, MD, FACS, a cardiothoracic surgeon, and Joe Schwarz, MD, FACS, an ear, nose, and throat surgeon, was a representative.

Now more than ever, members of the College are becoming a strong and active force in the legislation of malpractice reform. For instance, the College has supported legislation such as the Medical Liability Reform; the Help Efficient, Accessible, Low-Cost, Timely Healthcare Act of 2005; the Medicare Physician Payment-Medicare Value-Based Purchasing for Physicians' Services Act of 2005; the Preserving Patient Access to Physicians Act of 2005; and the Medicare Coverage Screening Abdominal Aortic Aneurysms Very Efficiently Act of 2005. Most recently, members have been urged to sign the petition for Mitigating the Impact of Uncompensated Service and Time Act of 2007.²³ The latter legislation has been introduced in the U.S. House of Representatives to help physicians recoup some of the financial losses they incur while taking emergency department call.

The College's Division of Advocacy and Health Policy helps the College to lobby draft legislation at the state and federal levels, to prepare legislative and issue briefings, and to provide testimony for committee hearings. Furthermore, it has sponsored a complimentary consultation for practice management during the Clinical Congress for issues such as coding and reimbursement, compliance with the Health Information Portability and Accountability Act, group mergers, and contract negotiations.



Dr. Santiago is a first-year general surgery resident at University of South Florida, Tampa.

The era of hour limitations

In the ideal health care system, patients are offered affordable, effective, sensible, and close-to-home surgical services by experienced physicians. Medical errors, complication rates, and length of hospital stays are kept to a minimum through continued hands-on training and the application of the latest medical and surgical technologies. In such a system, surgeons are delighted to improve patients' lives as long as they are also able to stay abreast of the latest medical knowledge, they are not subject to frivolous defamation and lawsuits, and their practice remains profitable. Nevertheless, the reality of surgery is far from ideal because it is influenced by complex cultural, societal, and market forces.

It has been proposed that implementing work-hour restrictions on attending physicians may be beneficial in surgical practice. However, such a policy has potential advantages and disadvantages. On one hand, it may help reduce specialized manpower cost, improve patient safety by reducing case load and fatigue, reduce medical error liability and malpractice insurance cost, foster academic activities such as medical research and education, and enable the hiring of junior attending physicians for a fraction of the cost. On the other hand, it is arguable that it may jeopardize client satisfaction by limiting the amount of time physicians dedicate to their patients. It is also worrisome that more patients could be referred to surgeons with less operative experience in an effort to reduce cost, which may then result, ironically, in increased morbidity and mortality, inefficient resource use, unacceptable medical liability, and, ultimately, fewer referrals. Moreover, the more experienced surgeons may opt to relocate to geographical areas where overhead and medical insurance costs are not prohibitive and that allow for higher incomes. This exodus of experts could be detrimental to medical education and may even leave entire towns without basic surgical services, thus necessitating long-distance transport to already congested tertiary hospitals in neighboring cities.

Locum tenens

The general surgery enterprise has experienced changes similar to those seen in the management consulting, banking, and engineering industries.

Hospital directors, medical managers, and human resource personnel are proposing and implementing business models to deliver competitive and comprehensive services to their served populations. Great emphasis continues to be put on innovative ways for reducing cost, improving return on capital investment, improving service quality, and promoting new services. Nevertheless, hospital managers are refocusing their attention on the liabilities produced by medical error and on how these may affect patient safety, service availability, institution trustworthiness, and, of course, profit. It is noteworthy that hospitals have invested heavily in information technology and new business processes (for example, medication reconciliation, pain scales, and so on) in order to expedite care and increase patient safety. However, even though physician workload, fatigue, and inexperience have long been recognized as potential sources of medical error, these human matters have not been addressed as aggressively as financial and organizational ones.

In this sense, the hiring of surgeons as locum tenens presumably serves multiple purposes—namely, to relieve the workload and improve the quality of life of the permanent staff, to meet work hour regulations, and to make available a broader offering of services to patients without assuming the cost of recurring employment benefits. Furthermore, the novice surgeon benefits from this modality as some hospitals agree to pay for malpractice insurance and ancillary services. Nevertheless, it is arguable that the outsourcing of medical services may be detrimental to patient

Dr. Karamichalis is a
cardiothoracic surgeon
at Royal Brompton
Hospital, London, UK,
and a member of the
RAS-ACS Advisory
Committee.



care because locum tenens may not have the same sense of ownership as permanent staff. For instance, a patient may present to the emergency room with an acute condition, and the physician on-call may limit his or her duty to the initial work-up without a greater sense of urgency. Moreover, patients may misinterpret the lack of continuity of care as gross inattention. Of most concern, nonetheless, is the possibility that a temporary physician may lose the ability to empathize with patients if he or she is unable to enjoy patient recuperation in the long term.

As the new generation of surgeons, residents share the responsibility of standing up for our profession and of being proactive in matters regarding national health policy and surgical education and practice. Most importantly, we should strive to meet today's demands without comprising patient care. □

References

1. Center on Budget and Policy Priorities. The number of uninsured Americans is at an all-time high. August 29, 2006. Available at: <http://www.cbpp.org/8-29-06health.htm>. Accessed May 24, 2007.
2. Ozgediz D, Roayaie K, Wang J. Surgery and global health: The perspective of UCSF residents on training, research, and service. *Bull Am Coll Surg*. 2006;91(5):26-35.
3. Lovinget SP. Volunteers hone skills while helping the needy. *Surgery News*. March 2007:16.
4. Karamichalis JM, Möller MG. Surgery residents and volunteerism. *Bull Am Coll Surg*. 2005;90(7):23-26.
5. Schecter WP, Farmer D. Surgery and global health: A mandate for training, research, and service—A faculty perspective from the UCSF. *Bull Am Coll Surg*. 2006;91(5):36-38.
6. Russell TR. From my perspective. *Bull Am Coll Surg*. 2007;92(3):4-7.
7. Operation Giving Back. Available at: www.operationgivingback.facs.org. Accessed May 24, 2007.
8. Wolfberg AJ. Volunteering overseas—Lessons from Surgical Brigades. *N Engl J Med*. 2006;354(5):443-445.
9. Public Law 105-19. 105th Congress. Volunteer Protection Act of 1997. http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=105_cong_public_laws&docid=f:publ19.105.pdf Accessed May 25, 2007.
10. Hattis PA, Walton J. Understanding Charitable Immunity Legislation. A Volunteers in Health Care Guide. 2004. Volunteers in Health. Available at: www.volunteersinhealthcare.org. Accessed May 24, 2007.
11. Anderson KD. Presidential Address: Crises in humanity. *Bull Am Coll Surg*. 2005;90(12):10-16.
12. Farley DR, Van Heerden J. Can you pass this mock oral examination? Today's correct answers may not be tomorrow's. *Contemp Surg*. 2007;63(4):158-160.
13. Zingmond DS, McGory ML, Ko CL. Hospitalizations before and after gastric bypass surgery. *JAMA*. 2005;294(15):1918-1924.
14. Sugarbaker PH. New standard of care for appendiceal epithelial neoplasms and pseudomyxoma peritonei syndrome? *Lancet*. 2006;7(1):69-76.
15. LaFreniere R. What's new in general surgery: Surgical oncology. *J Am Coll Surg*. 2004;198(6):966-988.
16. Peters JH, Gried GM, Swanstrom LL, et al. Development and validation of a program of education and assessment of the basic fundamentals of laparoscopic surgery. *Surgery*. 2004;135(1):21-27.
17. Whitten P, Mair F. Telesurgery versus telemedicine in surgery: An overview. *Surg Tech Int*. 2004;12:68-72.
18. Satava RM. Robotics in colorectal surgery: Telemonitoring and telerobotics. *Surg Clin North Am*. 2006;86(4):927-936.
19. Ballantyne GH. Robotic surgery, telerobotic surgery, telepresence, and telementoring. *Surg Endosc*. 2002;16:1389-1402.
20. Robins N. *The Girl Who Died Twice: The Libby Zion Case and the Hidden Hazards of Hospitals*. New York, NY: Delacorte Press; 1995.
21. Mueller LP. Manpower issues: A golden opportunity. Advocacy blog. Available at: http://efacs.org/forum/viewpost_171_1.html. Accessed May 24, 2007.
22. Statement of the American College of Surgeons to House Energy and Commerce Committee Subcommittee on Health by Thomas Russell, MD, FACS, on Medicare Physician Payments: 2007 and beyond. September 28, 2006. Available at: <http://www.facs.org/ahp/testimony/russell0906.html>. Accessed May 24, 2007.
23. ACS advocacy Web portal link. Available at: http://www.capitolconnect.com/acspa/alert_detail.aspx?AlertID=42. Accessed May 24, 2007.

Dr. Mammen is chief resident of general surgery at University of Cincinnati, OH.

