Surgery: A Noble Profession in a Changing World

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Members of the American Surgical Association, honored guests, ladies and gentlemen: First, allow me to thank the membership for electing me president of this august organization. The greatest honor that can be bestowed on any surgeon is to be elected president of this, the oldest and most prestigious surgical association in the nation. For me, personally, it is not only the greatest honor of my life, but also the most unexpected.

And now, let me take a moment to thank the most important person in my life, my bride of 33 years, Kim. I could not have accomplished what I have were it not for her love, her endless patience, her unfailing support, and her great personal sacrifice. Kimmie, thank you.

At last year’s meeting in Colorado Springs, when my election as president was announced, my dear friend Dr. James C. Thompson of Galveston approached me with his characteristic broad smile and boyish demeanor and whispered in my ear, “There goes the neighborhood!” He was the first to acknowledge that my election as ASA President was unusual: I am the first minority to hold this office and a relatively recent immigrant from a small African village, Saganeiti, in a small African country, Eritrea, one of the youngest and poorest countries in the besieged Horn of Africa.

Given these unlikely circumstances, I debated how to entitle my address. Should it be: “It can only happen in America,” or “From Saganeiti to San Francisco”? In the end, I chose neither. Instead, I have selected the title “Surgery: A Noble Profession in a Changing World.” While carrying a faint echo of the sentiments I just expressed, the title allows me to expand on the views and concepts I have acquired as a surgical department chair, dean of a school of medicine, and chancellor of a health sciences university at the end of the 20th century and the beginning of the 21st.

Contributions of Surgery

Surgery is, indeed, one of the noblest of professions. Here is how Webster’s Third New International Dictionary defines the word noble: 1) possessing outstanding qualities such as eminence, dignity; 2) having power of transmitting by inheritance; 3) indicating superiority or commanding excellence of mind, character, or high ideals or morals.

These three attributes befit the profession of surgery. Over centuries, the surgical profession has set the standards of ethical and humane practice. Surgeons have made magnificent contributions in education, clinical care, and science. Their landmark accomplishments in surgical science and innovations in operative technique have revolutionized surgical care, saved countless lives, and significantly improved longevity and the quality of human life. Generations of surgeons have developed their craft and passed it on to succeeding generations, as they have to me and to each one of you, to take into the future.

Beyond its scientific and technical contributions, surgery is uniquely fulfilling as a profession. It has disciplined itself over the centuries and dedicated its practice to the best welfare of all human beings. In return, it has been accorded the respect of society, of other professions, and of policy makers. Its conservative stance has served it well and has been the reason for its constancy and consistency.

At the beginning of the 21st century, however, profound changes are taking place at all levels and at a dizzying pace, providing both challenges and opportunities to the surgical profession. These changes are occurring on a global level, on the national level, in science and technology, in health care, and in surgical education and practice.

To retain its leadership position in innovation and its attractiveness as a career choice for students, surgery must evolve with the times. It is my belief that surgery needs to introduce changes to create new priorities in clinical practice, education, and research; to increase the morale and prestige of surgeons; and to preserve general surgery as a profession. I am reminded of a Chinese aphorism that says, “You cannot prevent the birds of unhappiness from flying over your head, but you can prevent them from building a nest in your hair.”
Changes on a Global Scale

Never in the history of humankind have so many profound changes occurred in such a relatively short period as they have done near the turn of the millennium. On the largest scale, a new world order has emerged, brought about by the end of the cold war, the growth of the global economy, and the development of high-speed communications. September 11th showed us just how small the world has really become and how world terrorism can easily invade the shores of a nation that until that moment had seemed the most secure.

The unprecedented magnitude of human migration and mobility makes people everywhere vulnerable to rare and exotic diseases from the most remote corners of the world. The travel time from the most distant country is shorter than the incubation period of most infections. The scourge of HIV/AIDS is now worldwide. The World Wide Web transmits at lightning speed information that bypasses national authorities. Television and other global media spread pictures of a popular and commercial cultural element that is in profound conflict with the values of old traditions and civilizations.

In the midst of this global new world order, the perspective of medicine must also be global. Experts who have studied the relationships between pandemics, the economy, and national policies have suggested that global health may be a powerful bridge to world peace.

American surgeons now provide an impressive array of expert services pro bono in many needy nations, an act of splendid individual volunteerism. But these efforts are now ad hoc. If these volunteer activities were strategically harmonized, American surgery could provide highly visible, meaningful educational and clinical services to the developing world. A well-organized outreach activity such as this could be attractive to philanthropy and could also provide unique clinical experience for housestaff in American surgery residencies. It is my hope that American surgery will look outward and consider this an idea whose time has come.

National Changes Affecting Surgery

Let us consider the changes occurring at the national level that will have a significant impact on surgery. These include the aging of the American population, changes in the composition of the workforce, the growth of minority populations, and an increasingly well-informed public. Perhaps the most important of these is the aging of the American population.

In the U.S., those age 65 years and older constitute about 13% of the population today and will increase to 20% by 2030 (Fig. 1). People over 85, those most likely to have chronic care needs, are the fastest-growing age group. Chronic conditions will increasingly consume resources and efforts in the future healthcare system. In 1996, 100 million Americans suffered from chronic conditions. This number will grow to 134 million by 2020. The cost of chronic conditions in 1990 was $425 billion, or 70% of the total healthcare expenditure. In 2001, fewer than 20 chronic conditions consumed 80% of the personal health expenditure. To be a key player in the management of chronic conditions, surgery must develop a strategic approach so that it is not relegated to the last position in the food chain. After all, surgeons play a critical role in the management of cardiovascular disease, cancer, diabetes, and joint and neurodegenerative diseases.

Changes in the composition of the workforce and of the entire U.S. population represent two other key demographics at the national level that will affect surgical education and practice. In 1950, women accounted for 27.4% of the total workforce. In the year 2000, they accounted for 44.3% of the workforce (Fig. 2).
A similar change is taking place in medicine. The gender gap that existed in the composition of medical students is now essentially closed (Fig. 3). By contrast, the gender composition of the membership of the American Surgical Association is far behind this trend. Undoubtedly the pipeline issue has been one problem.

Nevertheless, in 2002, we have only 20 active, 6 senior, and 2 honorary women members in our association. We must make a concerted effort to recruit more women into our membership. The future vitality of the association and of the entire profession of surgery, for that matter, will depend on how well women are integrated as members and leaders.

Likewise, a major demographic shift has occurred with the growth in minority populations in the U.S. Some 56 million Americans are new immigrants, most of them from Mexico, Latin America, and Asia (Fig. 4). The number of minority members in the Association is pitifully small. The election of a minority as President of the Association stands in stark contrast to the small number of its minority members. I am humbled by your electing me President and see it as an important statement of resolve on the part of the Association to address the need for greater diversity in its membership.

The increasingly well-informed public has had a profound effect on the practice of medicine. Some 70,000 websites now exist, purporting to give the public answers and solutions to its healthcare questions and needs. The information given by these websites is often superficial, sometimes misleading, and occasionally harmful. Some websites, however, do provide useful information and service. The Internet has been used to improve the quality of informed consent by providing videos of surgical procedures and discussion of risks and benefits of operations. The surgical profession must use the Internet strategically, not only for doctor–patient interaction, but also to ensure that the public receives the right information and is appropriately informed about surgical care. It is my belief that a well-informed public is the best ally for the surgical profession. In the healthcare systems of the future, patients will be playing a more prominent role in their own care.

**Advances in Science and Technology**

The coalescence of major advances in science and technology made the end of the 20th century unique in human history. Notable among the achievements are the development of microchips and miniaturization, which fueled the explosion in information technology. The structure of the human genome is nearly completely elucidated, ushering in the genomic era in which genetic information will be used to predict, on an individual basis, susceptibility to disease and responsiveness to drug therapy. A whole field of pharmacogenetics has been born. National Science Foundation funding has enabled scientists to develop femto-second laser and medical robotics that will make surgery safer, cheaper, and more precise. The field of nanotechnology allows scientists to work at a resolution of less than one nanometer, the size of the atom. By comparison, the DNA molecule is 2.5 nanometers.

In the last 50 years, biomedical research became increasingly reductionist, turning physiologists and anatomists into molecular biologists. As a result, two basic science fields—integrative physiology and gross anatomy—now have a lower standing in medical education and surgical science than they once did. Surgery and surgical departments can and possibly should claim these fields, but the window of opportunity is narrow. Research is now moving back from discipline-based reductionist science to multidisciplinary science of complexity, in which biomedical scientists work side by side with engineers, mathematicians, and bioinformaticists. The ability of high-speed computers to quickly
process tens of millions of pieces of data now allows for data-driven rather than hypothesis-based research. This collaboration among different disciplines has already been successful. Techniques are now available to study how molecules behave in situ within a living cell without destroying their microenvironment. Remarkable advances now enable scientists to observe directly how molecules walk within the cell, a field known as “molecular motors.”

My prediction is that the ability to use molecular techniques to answer questions about the whole organism, combined with advanced imaging technology and bioinformatics, will allow future young surgeons to answer new questions that will have potential applications in the surgery of tomorrow. Hence, organizations like the American Surgical Association must ensure the continued production of future surgeon-scientists with expertise in all fields, particularly in genetics, bioinformatics, and bioengineering. We cannot aim any lower, as Robert Browning has observed: “Ah, but a man’s reach should exceed his grasp, or what is a heaven for?”

The ASA fellowships are an important enabling mechanism to train the surgeon-scientists of the future who will keep surgical science at the cutting edge. Possibilities for important contributions also exist in the fields of minimal access surgery, robotics, and simulation technology. Minimal access surgery was a major contribution at the end of the last century, but much remains to be done to improve access, visibility, instrumentation, and miniaturization. Computer-assisted or robotic surgery is in its infancy, but there is no doubt that this field will flourish. Computer-assisted surgery and telemedicine can be used to train surgeons in distant places, including the developing countries.

Medical simulators have attracted widespread interest from policy makers, purchasers, regulators, industry, and the public. Medical simulators will be increasingly required to train surgeons in operative techniques and to assess their technical competence. The public sees this as a matter of patient safety.

These areas are ripe for development and provide fresh opportunities for surgeons to lead in incorporating advances in technology to promote surgical training and create innovations in surgical technique, and to initiate creative partnerships with industry to accomplish this.

Transformation of the Healthcare System

During the past 75 years, we have seen the entire healthcare system undergo a profound transformation. In the 1930s and for a considerable period thereafter, medical practice was fee-for-service, the doctor–patient relationship was strong, and the physician perceived himself or herself as being responsible nearly exclusively to his or her individual patients. The texture of medical practice started to change when the federal government became involved in the provision of healthcare by introducing Medicare and Medicaid in 1965.

This event was seminal because it began to introduce the concept that a doctor’s responsibility was not only to individual patients, but also to populations of patients. More importantly, Medicare and Medicaid introduced large amounts of public funds into healthcare. Services to the elderly and the poor were now paid for, and new money was available to fund graduate medical education. As a result, academic departments progressively increased the size of their clinical faculties. These were the halcyon days of academic medicine, which lasted roughly until the mid-1980s.

The bubble burst with the introduction of managed care and market-driven healthcare. Financial control and control of access to healthcare were taken over by HMOs and insurance companies. As-for-profit medicine proliferated, the health of our patients has come to be treated as a commodity traded daily on Wall Street. History will record that the medical profession was sidelined and watched helplessly as MBAs and business executives defined the fate of healthcare. It is my hope that as we enter the post-managed care era, as we most certainly are doing now, organized medicine and academia will, this time, not be bystanders, but will claim their rightful role in developing the new healthcare system for the 21st century. A new healthcare system is needed because the frustration of both patients and clinicians has reached unacceptable levels.

The Institute of Medicine published a report last year entitled Crossing the Quality Chasm: A New Health System for the 21st Century. The report states, “Healthcare today harms too frequently and routinely fails to deliver its potential benefits.” The report’s most important conclusion, however, is this: “The current care systems cannot do the job. Trying harder will not work. Changing systems of care will.” Herein, then, lies the first opportunity for organized medicine and academia to lead in designing the healthcare system for the 21st century by reshaping clinical practice to be evidence-based and quality-driven, and by making sure doctors are at the table when healthcare policies are formulated and promulgated.

I believe that, after its deplorable experience with managed care, the American public will insist that healthcare be brought under the control of healthcare professionals. President Bush recently uttered these same words. But we cannot underestimate the power of the HMO lobby. Our efforts must focus not only on policy makers but also on the grassroots. We must mobilize every physician and every nurse to participate in securing patients’ support to advocate for a new healthcare system that is run by healthcare professionals.

The necessary changes in clinical medicine must be driven by evidence-based practice that is informed by outcome measures and continuous monitoring of quality and patient safety. Such a process will require the institution of electronic patient records across the system.
The IOM committee on “Crossing the Quality Chasm” identified six key attributes of the 21st-century healthcare system. It must be:

1. Safe, avoiding injuries to patients
2. Effective, providing services based on scientific knowledge
3. Patient-oriented, respectful of and responsive to individual patients’ needs, values, and preferences
4. Timely, reducing waits, eliminating harmful delays for both care receiver and caregiver
5. Efficient, avoiding wasted equipment, supplies, ideas, and energy
6. Equitable, providing equal care across genders, ethnicities, geographic locations, and socioeconomic strata

No one knows at present what this 21st-century healthcare system will look like. Dr. Ralph Snyderman, chancellor of health affairs at Duke University, sees several pointed differences between the “old” and “new” systems.

While care in the old system was reactive, in the new system it will be proactive. The “find it, fix it” approach of the old system will be replaced by a “predict it, prevent it, and if you cannot prevent it, fix it” approach. Sporadic intervention, provided only when patients present with illness, will give way to a system in which physicians and other healthcare providers plan 1-, 5-, and 10-year care programs for each patient. Care will be more interactive, with patients taking a more important role in their own care. The technology-oriented system will become a system that provides graded intervention. Delivery systems will not be fractionated but integrated. Even more importantly, care will not be based simply on experience and clinical impression but on evidence of proven outcome measures. If the old system was cost-insensitive, the new system will be cost-sensitive.

New technologies will have an even more profound effect. The new healthcare system will have the ability to predict risk based on genetic factors, to minimize risk, to provide individualized care aided by pharmacogenetics and bioinformatics, and to manage chronic disease.

Effect on Surgical Education and Practice

How are all these changes going to affect surgical education and practice? Of course they already have begun to do so, and I shall examine this question from the perspective of the impending shortage of physicians and general surgeons, an approach that will enable us to examine the root causes of this unexpected development.

In 1981, the Graduate Medical Education National Advisory Committee and the Committee on Graduate Medical Education (COGME) estimated that there would be a 15% to 30% surplus of specialty physicians by 2000. In a remarkable reverse, newly developed physician supply estimates based on trend model analysis predict a deficit of 200,000 physicians by 2020. How could the 1981 estimates have been so wrong?

Apparently, the 1981 studies failed to accurately account for population growth by 15 million and underestimated the work effort of physicians. The studies did not properly account for the increase in women physicians and the fact that women physicians as a group average 20% fewer work hours than men. Neither did they account for the decrease in productivity of aging physicians. In addition, early retirement of physicians is on the increase, and the number of medical students selecting careers in primary care specialties and in general surgery has declined. The aging American population has a greater need for healthcare services. The public has flatly rejected the system of primary care gatekeepers and has clearly asserted its preference for care by specialists.

A dearth of doctors is predicted based on the size of the general population and the effective supply of physicians, accounting for both gender and age of the physician workforce. These studies estimate a physician shortage of 50,000 by 2010 and 200,000 by 2020.

Richard Cooper has observed that the physician shortage is close to becoming a political problem. He says, and I quote, “We are about three or four years away from that point, but we are already seeing the early sign of shortages and of public unrest.”

Of more immediate concern to us is the decline in applications to medical school and to general surgery residencies. Data from the AAMC indicate that the number of applications to medical schools has declined from a high of nearly 47,000 in 1996-97 to less than 35,000 in 2001-02 (Fig. 5). Some of the reasons cited to explain this decline are the diminished prestige of the medical profession, the drop in financial compensation for physicians, the perception that the practice of medicine is less professionally rewarding, and the high financial debt incurred by students, which averages $97,000 per student on graduation. Another little-appreciated fact is that only about 13,000 of the 16,000 students we graduate enter graduate medical education. Most of the rest are believed to go into biotechnology and the pharmaceutical and healthcare consulting industries.

In the March 2002 issue of Archives of Surgery, Bland and Isaacs provide an analysis of the AAMC database of trends in general surgery as a career choice among medical students. The pattern they identify is particularly troubling. In the late 1980s, general surgery was the first choice of specialty for some 10% of U.S. senior medical students. By 2001, this figure had declined to 6%, a 40% drop (Fig. 6).

Bland and Isaacs further examine the percentage of categorical positions offered in general surgery that were actually filled by U.S. graduates. The percentage of matched categorical positions declined from a high of nearly 90% in 1995 to less than 80% in 2001. The linear projection estimates performed by Bland and Isaacs anticipate further decline to 76.6% by 2005 (Fig. 7). Unfortunately, the decline has been even faster, since only 75% of positions were
matched in 2002. Reversing this trend is the most important challenge for general surgery.

There are many reasons for the declining interest in general surgery, some of which parallel reasons for the drop in medical school applicants in general. One problem specific to surgery is that medical students are given less and less exposure to surgery, due to the shortening of required surgical rotations. Most important, however, is their perception that the life of the surgical resident is stressful, the work hours too long, and the time for personal and family needs inadequate. The workload of the surgical resident over the years has increased significantly both in amount and intensity, without concomitant increase in the number of residents and at a time when hospitals have significantly reduced the support personnel on the surgical ward and in the operating rooms. Students graduating with debts close to $100,000 simply find the years of training in surgery too long, followed by uncertain practice income after graduation.

From several recent studies, lifestyle is the critical and most pressing issue in surgical residency. Some studies have also shown that the best students tend to select specialties that provide controllable lifestyles, such as radiology, dermatology, and ophthalmology. We have a problem not only in the declining number of students applying for surgical training but also in the declining quality of those who do apply.

In a preliminary survey of 153 responding general surgery programs, we found that attrition (i.e., categorical
residents leaving the training programs) occurred at a rate of 13% to 19% in the last 5 years. In 2001, 46% of those leaving general surgery training programs cited lifestyle as the major reason.

Unless these trends are reversed, general surgery as a specialty is threatened, and a future shortage of general surgeons is inevitable. I know that the Council of the American Surgical Association is most concerned about the crisis in general surgery. We must do a better job of communicating to students and residents that the practice of surgery is as rewarding as ever and full of opportunities in this new era. Innovations in minimal access and computer-assisted surgery and simulation technology provide exciting new possibilities in surgical training. We must also look very carefully at the demands of surgical residency and improve the life of residents without compromising their surgical experience. Unless we deal with work hours and quality of life issues, we are likely to see continuing decline in the interest of medical students in surgical training.

I have no doubt that the ASA, working collectively with the ACS, ABS, RRC, SSAT, and other surgical organizations, will solve these problems and create opportunity out of adversity.

In conclusion, ladies and gentlemen, the noble profession of surgery must rise to meet numerous challenges as the world in which it operates continues to undergo profound change. These challenges represent opportunities for the profession to develop an international perspective and a global outreach and to address the growing needs of an aging population undergoing major demographic and workforce shifts. The leadership of American surgery has a unique role to play in the formulation of a new healthcare system for the 21st century. This task will require commitment to quality of care and patient safety, and it will depend on harnessing the trust and support of the American public. Advances in science and technology—particularly in minimal access surgery, robotics, and simulation technology—provide unprecedented opportunity for surgeons to continue to make landmark contributions that will improve surgical care and the human condition. I believe it is also crucially important that we train surgeon-scientists who will keep surgery at the cutting edge in the genomic and bioinformatics era.

That’s the easy part. We all find it easy to be excited by our love of medicine and surgery, the passion that brought us to this noble profession in the first place. The daunting task will be rethinking and restructuring our training programs and ensuring that surgeons are adequately reimbursed and can practice with less hassle than they do now. Failure to succeed in this struggle threatens the viability of general surgery and will lead to a shortage of surgeons at a time when terrorism poses an urgent threat to national security.

Ours is a noble profession imbued with eminence, dignity, high ideals, and ethical values. It has a rich and proud heritage. I am confident that surgery will meet the challenges of the 21st century and that the American Surgical Association will play a key role in this process. Thomas Babington Macaulay must have been thinking of the American Surgical Association when he wrote, and I quote, “The highest intellects, like the tops of mountains, are the first to catch and reflect the dawn.”

It has been a great honor and privilege to serve as your president, and I am deeply grateful for the confidence and trust of the members of the American Surgical Association. Thank you.

References