Navigation in Uncharted Waters
Is Anesthesiology on Course for the 21st Century?

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IT is an honor to join a group of distinguished colleagues who have delivered the Rovenstine lecture previously. Dr. Rovenstine has special meaning for me because he was a fellow Hoosier and graduate of Indiana University, my alma mater for both undergraduate and graduate medical education. However, I am humbled by this recognition, also. I am aware that there are many in this audience who possess more judgment and knowledge than I, and all of us would benefit from their wisdom on this occasion. Nevertheless, I accept the opportunity with enthusiasm, for I believe these are defining times for the specialty.

The thoughts that follow are mine only, and they will benefit from group discussion and modification by collective wisdom. My purpose is to catalyze these discussions and stimulate action by both the leaders and the membership of this society.

My title suggests an analogy between my vocation, anesthesiology, and my avocation, sailing. Both require careful route planning to reach a desired destination, so the analogy seems appropriate. My comments are divided into four sections, which are intended to define the current position of the specialty and plot a course for the future.

The American Health Care System

As we approach the 21st century, American medicine faces challenges it has not experienced previously. In the 25 years preceding 1992, health care costs increased from 6% to 14% of the gross domestic product. Rising costs and limited access to health care alarmed the public and stimulated the Health Security Act of 1993. Although Congress did not adopt the plan, the accompanying debate triggered a frenzy of activities by individuals and corporations, who recognized the potential business opportunities in our health care system.

In his recent book, Derek Bok opened the chapter on "Doctors" by stating, "Of all the private professions, medicine has been the most successful in shielding its compensation from the chill winds of competition." These chill winds are now present throughout the health care system. What began in the 1980s as public interest and concern has accelerated into the last great Buffalo hunt for health care entrepreneurs. As a result, fundamental principles of health care delivery are often abandoned, and the pace of change is ever accelerating. Cost containment is the watchword of practice, and both hospitals and health maintenance organizations openly embrace "economic credentialism" as a part of performance evaluation. Individual care, the guiding principle of our health care system throughout the 20th century, is replaced by population-based care.

Inpatient hospital care is reduced drastically or eliminated, replaced by ambulatory care and home care. Primary care physicians have become the "gatekeepers" of both patient referrals and professional fees. Financial incentives encourage gatekeepers to restrict specialty referrals and provide care in less expensive environments. Self-employed physicians have become corporate employees, and nonphysician providers replace physicians wherever possible. Speciality care, once considered a strength of the American system, is now maligned as an example of waste and unnecessary expense. Prestige has shifted from highly trained specialists to generalists, leaving medical students, house officers, and practitioners confused about career choice or value of their services.
Workforce changes are an inevitable result of these changing values. Anesthesiology has been a prime example of those workforce changes, evidenced by a dramatic decrease in the number of medical students entering anesthesiology in recent years. However, these changes have not been unique to our discipline, nor are they limited to specialties such as radiology, anesthesiology, or pathology. Since 1990, there has been an overall 46% reduction in the number of American medical graduates who entered the National Resident Matching Program matches for the medical subspecialties. The number of American medical graduates entering the subspecialties of cardiology, pulmonology, and gastroenterology has decreased by 39%, 41%, and 64%, respectively, since 1992.†

Unfortunately, the causes of rising health care costs have received little attention. Many attribute these costs to greedy physicians, expensive technologies, or unnecessary procedures. Few acknowledge that improved survival leads to recurring health care costs for those with chronic illnesses. In brief, good medicine keeps sick people alive. In addition, the costs of medical research, new technologies, and drug development are rarely appreciated by a society that benefits greatly from these remarkable advances.

Challenges for Anesthesiology

These changes are especially threatening to anesthesiology. Market forces affect all physicians, but anesthesiologists are further challenged by a lack of public image and lack of support from those who are ill.

Simply put, there is no lobby for anesthesiology, as there is for AIDS, breast cancer, or Alzheimer’s disease, for example. Many patients remain uninformed about the role of the modern anesthesiologist or the importance of anesthesia care to long-term surgical outcome. We, of course, have contributed to these problems by our own behavior, both individually and collectively.

Others cite anesthesiologists as examples of the concept that tertiary care medicine means high technology medicine, provided by aloof and impersonal technocrats rather than caring physicians. Far too often, we have limited our activities to intraoperative care only, and thus have been invisible to our patients. Collectively, we have been equally invisible in setting health care priorities or addressing public health needs. Anesthesiologists have first-hand clinical experience with the consequences of smoking, alcohol, illicit drugs, violence, and limited access to health care, but we have not used the resources of the American Society of Anesthesiologists as our collective voice to emphasize our concerns about these important public health matters. The risks to our profession are considerable, and we are especially vulnerable in this era of cost containment.

Health workforce issues were the major theme of the 1995 annual meeting of the Association of Academic Health Centers, the national organization for corporate leaders of academic health centers. Selected experts briefed these leaders on a variety of general issues in health care, but anesthesiology was the only specialty that received individual discussion. The presentation by the President of Health Economics Research, Inc., focused on “physician substitution” as a cost saving technique.‡ It included the following statements:

“Anesthesia is a traditional nursing function that has been replaced, in a fair part, by physicians over the past 20 to 25 years.”

“Anesthesia, therefore, provides an excellent example of what can go wrong with the workforce mix when you pay for inputs (i.e., types of providers) rather than outputs (i.e., the services delivered).”

“Nurse anesthetists can perform nearly all the anesthesia tasks with minimal supervision and are nearly perfect substitutes for anesthesiologists.”

These views were presented to some of the most influential leaders in all of medicine. Members of this elite organization advise both government and the private sector on health policy, and they make the strategic decisions that influence our medical schools, our graduate medical education programs, and our university teaching hospitals. In turn, these are the organizations that influence the attitudes of our colleagues in other disciplines, and especially the attitudes of the future physicians of this country.

The presentation on physician substitution made no reference to quality of the service provided, but only to the type of service. The author presumed that all anesthesia care was equal in quality, or that anesthesia care had no influence on outcome. The flaws in this fundamental tenet may be obvious to us, but, clearly, they were not apparent to others. Perhaps we are victims of our accomplishments, because anesthesia mortality has decreased so dramatically in recent decades. Perhaps these attitudes result from our failure to explore the value of anesthesiology services to overall


Anesthesiology, V 86, No 3, Mar 1997
patient outcome. Perhaps we have failed to extol the importance of anesthesiology to both our medical colleagues and to society. Perhaps we have failed to link more closely with those who understand our value best. Certainly our surgical colleagues recognize the value of our services when they request particular anesthesiologists for challenging surgical problems, but we have done little to form alliances with surgeons and surgical organizations in this changing health care environment.

Up to this point, I have emphasized some of the stormy seas and fierce currents that have buffeted all of medicine, and anesthesiology in particular. However, these concerns must be balanced by the potential benefits resulting from changes in health care delivery, and by the accomplishments of modern anesthesiologists. Many would argue that the new emphasis on primary care and population-based medicine will have long-term beneficial effects on the health status of the American public. The best health care is that which extends the interval of wellness, not that which prolongs illness. Strategies for disease prevention and wellness will benefit the majority of the population who are healthy and well currently. Recent federal legislation that mandates insurers to provide transportable health care coverage should decrease the number of individuals who lose health care benefits, especially in an era when downsizing and part-time employment are common in corporate America. In addition, anesthesiologists have contributed greatly to improved surgical care in recent decades.

We have expanded into new areas of practice, also. Examples include the preoperative assessment of surgical patients, acute pain management for postoperative surgical patients, critical care medicine, cancer pain management, and chronic pain management. Other recent Ravenstine lecturers have summarized these areas of practice, but a few special examples deserve emphasis.

A small number of visionary departments, including both those in academic centers and those in the community practice, are exploring the boundaries and pushing the frontiers of anesthesiology, with almost universally positive results. Preoperative evaluation of surgical patients has expanded to include not simply the preanesthetic considerations, but the complete preoperative preparation of the surgical patient. This approach avoids the limitations of algorithms for preoperative care that are based on the operation only, with little attention to coexisting diseases. It avoids the tendency to order excessive laboratory or radiologic evaluations "because anesthesia (sic) will want them." It decreases the tendency to refer preoperative evaluation to a medical consultant who is well intentioned but not currently knowledgeable about anesthesiology or surgical practice. In short, it places the preoperative preparation responsibilities squarely in the hands of those who will be caring for the surgical patient during the most unstable portions of their illness. This approach is even more valuable when combined with active participation in postoperative care.

Visionary departments participate in critical care medicine and in subspecialty areas of intensive care medicine, such as the care of postoperative cardiac surgical or neurosurgical patients. Anesthesiologists who enter into these arrangements become integral members of a team of physicians who care for surgical patients. These efforts have enhanced the image of our specialty greatly. Surgeons, nurses, patients, and their families identify the anesthesiologist as an essential member of the care team. In addition, the quality of care that results from this team approach is unmatched by anything I have witnessed in surgical care previously.

Many of these visionary departments have expanded into diverse areas of pain medicine also. Here again, the results of these efforts have been almost universally beneficial to patients, to colleagues, and, consequently, to the image of the specialty. Patients and their families are especially grateful to those anesthesiologists who provide acute pain management services. Similarly, both patients and referring physicians have high regard for anesthesiologists who provide chronic pain care. Several anesthesiologists have taken leadership roles in the management of cancer pain, including home care or hospice care for those with terminal illnesses. The specialty benefits tremendously from such efforts, because they provide increased visibility for the discipline, and they demonstrate our commitment to important chronic health care problems.

If such approaches were universal, then I could end this presentation on a very positive note, with kudos for all. I would conclude that anesthesiology is on course for the 21st century and only recommend occasional reevaluations, to be certain we have not drifted off course in the coming years. Unfortunately, these approaches are not universal. Many in both academic and community practice are tempted by expedient routes for clinical practice, education, and research in anesthesiology. These approaches may be attractive for the immediate future, but they will have long-term negative consequences for the specialty in the first quarter.
of the next century. To follow the analogy, the expedient and comfortable approach will lead us into shoal waters and the specialty may run aground in the future.

The temptation to avoid change is considerable. Anesthesiologists benefited from an especially comfortable lifestyle in recent decades. We have not been the most well rewarded financially, nor have we worked less than those in many other disciplines. However, a practice limited to the operating room produced a combination of financial reward and controlled hours that was the envy of many of our colleagues. These work conditions are difficult to abandon, and there is a strong tendency to maintain the practice patterns that produced these comfortable benefits. In addition, older leaders may be unprepared to lead clinical initiatives in new areas of practice, and some may be tempted to maintain the status quo for just a few more years until their own retirement.

Educational leaders may make short-term expedient decisions also. There has been a steady decline in the number of American medical graduates entering anesthesiology in recent years, especially since 1992 (fig. 1). This decline reached dramatic proportions in the March 1996 National Resident Matching Program match, when 43 United States seniors matched for the clinical base year and 126 matched for the CA I year (fig. 2). The total of 169 American medical graduates entering the discipline amounts to approximately one trainee for each program, or 1.2% of American medical graduates who entered the match†‡


‡ Academic leaders have responded in a variety of ways that I believe are unhealthy for the long-term prospects of the specialty. Some have simply filled the resulting vacancies by hiring large numbers of international medical graduates. American medical graduates composed only 42% of those entering the clinical base year in 1995 or 1996. Some have retreated to an educational approach that focuses almost exclusively on intraoperative care and ignores the new frontiers of anesthesiology. Some leaders in academic anesthesiology have reinforced a defensive posture by decreasing their class size, to mask the shortfalls in resident recruitment. This is particularly unfortunate when it occurs in the leading programs that represent the future of clinical care, education, and research in the discipline.

Some academic programs are curtailing their research missions as well, principally as a result of financial pressures associated with health care in the 1990s. This too, is an expedient but ill-fated approach that will harm the specialty eventually. Fee-for-service medicine will be a niche market for nearly all when we enter the next century. Managed care and capitation will continue to grow, and practitioners will divide the discounted health care dollar based on work effort and contribution to outcome.

Here, anesthesiology faces stiff competition, especially because others may share the views that were expressed to the Association of Academic Health Centers. These attitudes will not be changed by negotiation skills or persuasive personalities, but by evidence that the services provided by anesthesiologists make important contributions to the quality of health care in
the 21st century. In short, both financial recognition and prestige will be determined by value (quality of outcome divided by cost of service), not by emotion. If we limit our efforts in research now, then we will be unable to document the value of our contributions to health care in the future.

We are at a decision-making point for the specialty. We have arrived at a midchannel marker, where we must make a choice regarding our destination. We can go in either of two directions without immediate threat of harm, but the long-term destination will be markedly different, depending on our choice. The land equivalent would be a fork in the road. One route isretrenchment to the operating rooms and preservation of lifestyle. Here, the waters may be smoother in the short term. The other involves a greater commitment to new areas of practice, education, and research, and will require us to buck strong headwinds and choppy seas in the short run. I choose the latter course, for I believe the long-term destination is simply so much more attractive that it justifies the short-term discomforts.

Opportunities for Anesthesiology Practice

Let us now look at some of the course corrections that will be required if my long-term vision is to be achieved.

Anesthesiology must include all aspects of perioperative medicine and pain management, an approach that Lawrence J. Saidman, M.D., championed in the Rovens- tine lecture of 1994. Anesthesiologists will need to assume new responsibilities for the perioperative care of surgical patients, including at least preoperative preparation, intraoperative care, recovery room care, postoperative intensive care, and acute pain management.

In a recent special article in the New England Journal of Medicine, Wachter and Goldman described the development of "hospitalists"; internists who specialize in hospital care. This approach is the medical equivalent of the perioperative medicine practice that several anesthesiology departments have adopted already. It should remind us to accelerate our efforts, to solidify our role in the perioperative care of surgical patients. Here we have the distinct advantages of knowledge, continuity of care, and regular professional relationships with our surgical colleagues, all of which should assist in accomplishing our goal. Others envision our role in perioperative medicine also.

In 1994, Wickham proposed that "the anaesthetist (sic) will be responsible for preoperative and postoperative care" as specialties realign in the future. We can encourage this process by clinical alliances with our surgical colleagues in specific areas of practice, such as the cardiac surgery or neurosurgical models I described earlier. Successful implementation of these ventures will inevitably lead to new opportunities, as others see the value of the services provided. Similarly, there are opportunities in chronic pain management that include collaboration with medical and surgical colleagues who have special interests in musculoskeletal disease and oncology, among others.

We will need to revise graduate medical education in anesthesiology to accomplish our purpose. Anesthesiology faculty members cannot retreat to the operating rooms to avoid perioperative medical practice, despite the natural comfort of the operating room environment for many of us. In addition, the structure of graduate medical education in anesthesiology must change if we are to become truly accomplished perioperative physicians. Specifically, the anesthesiology program should control the clinical base year. The American Board of Anesthesiology and the Residency Review Committee for Anesthesiology might mandate certain core rotations to ensure the development of clinical skills in the preoperative assessment of surgical patients. The subspecialty clinical track is considered a pseudo fellowship by some, and its existence both demeans the value of a true fellowship and questions the purpose of the CA III year for all. This track should be eliminated. The resulting CA III year would consist of an advanced clinical track that emphasizes perioperative medicine skills, especially on rotations where partnerships have been formed with surgical colleagues for the overall care of surgical patients. On many rotations, the CA III resident would be involved in the continuum of preoperative, intraoperative, and postoperative care of surgical patients. I venture that these changes would enhance the quality of education and improve the image of our discipline among medical and surgical colleagues, and certainly among patients.

The importance of anesthesiology research cannot be overemphasized, in my view. We cannot be leaders in education or practice if we simply apply the findings of others. Kingsman Brewster, then President of Yale, said it best in 1971: "If teaching is to be more than the retailing of the known, and if research is to seek real breakthroughs in the exploration of man and the cosmos, then teach-
ers must be scholars, and scholarship must be more than refinement of the inherited store of knowledge."

I envision themes for research in three major areas: mechanisms of drug action, the scientific basis of perioperative medicine, and the scientific basis of pain medicine. Although the identification of themes may appear simplistic or superficial to some, I believe there is real merit to such an approach. Research themes will help define the direction of the specialty, and research accomplishments will help secure our rights to new areas of practice. We cannot expect access to new practice opportunities if we simply apply the scientific accomplishments of others. Rather, we must contribute to the fundamental knowledge that guides clinical care in all the areas that we define as anesthesiology practice.

Finally, such themes are necessary to define the scientific interests of a specialty that is not identified with a specific disease or diseases.

Mechanisms of drug action might emphasize the actions of inhalation anesthetics, local anesthetics, opioids, analgesics, hypnotics, and other related drugs. Reductive approaches are required to understand the mechanisms responsible for the actions of these compounds, and to produce new, more potent and more specific drugs for the future. However, advances in the area of anesthetic mechanisms should lead to explorations in fundamental behavior. Here, there are opportunities to apply anesthesia-related findings to the mysteries of pain, consciousness, and sleep, especially by applying integrative neuroscience approaches to explore these most basic areas of behavior. There are huge opportunities for pain research also, and such approaches are essential if we seek to identify pain medicine with the discipline of anesthesiology. Studies involving the gene therapy of pain management might be an excellent example in this area.

Investigations in the area of perioperative medicine would be purposely diverse and inclusive, rather than restrictive. However, some of the greatest opportunities involve the care of the critically ill, and an understanding of the problems that are unique to this population. Unfortunately, many patients now survive the intraoperative course, only to wither in the intensive care unit postoperatively. Sepsis, septic shock, acute respiratory distress syndrome, and the multiple organ dysfunction syndrome are common denominators in these patients, and meaningful research in these areas is logical for clinician scientists who embrace perioperative medicine.

Investigations in clinical epidemiology and biostatistics are essential if we seek to define the contributions of quality anesthesia care to overall patient outcomes. Here, the work of Silber serves as an example for our efforts. Silber and colleagues analyzed factors that contributed to mortality (death rates), complications (adverse event rates), and failure to rescue (death rates in those who experienced complications) after operation. Their study involved 5,972 Medicare patients requiring cholecystectomy or transurethral prostatectomy. Among others, they examined the influence of board-certified anesthesiologists on surgical outcomes. The results demonstrated that adverse events were predicted primarily by patient factors, indicating that complication rates alone are a poor measure of provider quality. However, failure to rescue was a better measure of provider quality, presumably because it examined the clinical skills required to rescue the patient from complications resulting from underlying disease.

Both death rates and failure-to-rescue rates were negatively related to the proportion of board-certified anesthesiologists on the anesthesia provider staff. Stated in the positive, the more board-certified anesthesiologists involved in the delivery of anesthesia care, the better the outcomes, as measured by survival rates and rescue from complications. These are clear examples of research that demonstrate the value of our services, and help to define the provider mix for future practice.

All of medicine is moving toward the use of physician extenders, although there is scant clinical evidence to guide the implementation of such approaches. Anesthesiology, a field that has included nonphysician providers for many decades, is fruitful ground for exploring the relationships between provider type and outcome. In addition, such approaches will help resolve the emotional debates that now dominate the discussions involving solo practice versus the anesthesia care team approach. Defining the benefits and limitations of various practice models will allow the specialty to take a leadership role in national discussions involving workforce and health care delivery.

The American Society of Anesthesiologists will need to change as well if we are to achieve our full potential. Our Society has a major role in molding attitudes about the specialty, and its influences are evident in the specialty, in all of medicine, in government and regulatory agencies, and in the public media. Future public relations efforts should include our views on major public
health issues. The results of outcome studies that demonstrate the value of board-certified anesthesiologists could be emphasized also. Finally, our Society should work more closely with the major surgical societies wherever possible. Our combined voices would be more powerful and effective in areas of mutual agreement.

Conclusions

I have tried to identify what I believe to be the most important issues that face anesthesiology, and I have emphasized that this is a crucial interval for the future of the specialty. I am confident of our abilities to address these issues successfully, for there are several examples of community practices and academic programs where these approaches have succeeded already. I am less confident about our overall resolve to select a course that will be uncomfortable in the immediate future despite its apparent long-term benefits. Candidly, I worry that the seductive forces of fear, denial, political ambition, personal comfort, and inertia could lead us to a more comfortable defensive posture. This would be unfortunate for our patients and for our profession. Change will not be easy, but it will be rewarding. We have the opportunity to set the course for this discipline, especially during this interval of fundamental change in our health care system. We can stay the course or we can change. I think you know my choice. I concur with Yogi Berra, who said “When you come to a fork in the road, take it.” I hope the members and leadership of this Society will follow his adage also.

References