Surgical Oncology in the 21st Century

Presidential Address

Charles M. Balch, MD

Substantial advances in oncology research are now taking place that will clearly benefit patients with cancer as we approach the 21st century. These research advances range from those involving molecular biology to results of prospective clinical trials involving multimodality treatments. These advances will produce some fundamental changes that will affect our surgical practice and the expertise we bring to the care of patients with cancer in the next century.

I chose this topic for three reasons. First, multimodality cancer treatment will be used for the vast majority of patients with cancer in the future. This, in turn, will require a profound change in the coordination of cancer treatment by a team of specialists instead of the surgeon alone. Second, I am concerned that some patients with cancer may not have access to optimal surgical care in the future. My experience on the American Board of Surgery as well as conversations with surgeons in the community make it very clear that many surgical trainees and practicing surgeons are having a difficult time keeping pace with oncology advances because too many are not equipped educationally or are not willing to be fully engaged in partnership with other oncology specialists. Furthermore, any void left by surgeons in decision making is being filled by medical oncologists who have had little exposure to surgery as a treatment for cancer.

Third, the Society of Surgical Oncology and its members are the most appropriate group to provide leadership within both the surgical community and the oncology community to represent the value of surgical care for patients with cancer. To do this, we will have to broaden our vision as a society by boldly adopting an even more proactive role in cancer education and research as it relates to the surgical patient with cancer.

A GLIMPSE INTO THE FUTURE OF CANCER CARE

While the centerpiece of our specialty is surgical care for the patient with cancer, the uniqueness of our specialty is oncology management. Both are important, but the latter will be the emphasis of this talk. As we approach the 21st century, advances in oncology will have a major impact on the multidisciplinary treatment of the surgical patient with cancer as well as surgical education and cancer research.

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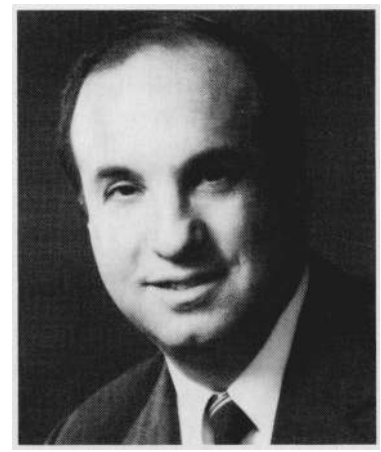

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The increased emphasis on multidisciplinary cancer care raises the important question about which physician specialty will coordinate cancer care in the future. It is already evident that cancer care will involve two or more treatment modalities for most patients in the future; in fact, it already does in many cases.

The traditional sequence of cancer management has involved either surgery alone or surgery as the first of a series of multimodality treatments, with the surgeon being the patient's entry point into the care system because we establish the diagnosis and give the first treatment. However, by the 21st century it is possible that only a minority of patients with cancer will have surgery alone as a single modality of treatment. It is more likely that chemotherapy and even radiation therapy will be used as the initial cancer treatment for many patients, while surgical treatment for some types of cancer will be relegated to a secondary or even a tertiary level.

For example, preoperative chemotherapy has been used for an increasing number of tumors, either to reduce tumor size (to facilitate the surgery) or to determine drug sensitivity in individual patients. This approach has been used successfully in patients with some stages of breast cancer, osteogenic sarcoma, testicular cancer, anal carcinoma, rectal carcinoma, gastric carcinoma, soft-tissue sarcoma, and esophageal carcinoma. On the other hand, there will be an increased role for surgical excision of distant metastatic disease as a means to achieve more complete responses in patients already responding to chemotherapy and/or radiation therapy.

COORDINATION OF CANCER CARE

As multimodality cancer treatment becomes standard for a larger number of patients, a central question is, "Who will coordinate the care of the patient with cancer?" Until recently, this has exclusively been the surgeon, but increasingly it will involve a team of oncology specialists. This team will be composed of surgeons (both specialist and generalist), medical oncologists, and radiation oncologists. What are their respective roles?

The surgeon and the surgical oncologist should continue to have the symbiotic relationship that we have had for decades. In general, surgical oncologists will work in tertiary-care hospitals, primarily in teaching institutions with surgical residency programs, while board-certified surgeons will continue to be the cancer surgery specialists in local hospitals. Both groups of surgeons have traditionally been involved in the overall care of their surgical patients, including the coordination of multidisciplinary cancer care. All surgeons must therefore incorporate new knowledge from oncology advances that now extend well beyond the technical aspects of surgery if we are to maintain a viable partnership with other oncology specialties.

The American Board of Surgery has sanctioned this concept by formally incorporating surgical oncology as one of its primary specialty components and defining it to include the broader components of oncology management in addition to cancer surgery (ie, coordinated multimodality management of the cancer patient by screening, surveillance, surgical therapy, adjunctive therapy, rehabilitation, and follow-up).

To do this, surgeons must address educational and practice issues that incorporate oncology principles to a greater degree than we have in the past. While this should not be a problem for most members of the Society of Surgical Oncology, I am very concerned that the practice of cancer care by community surgeons will not succeed unless there are fundamental changes in surgical residency training programs and continuing education that more fully incorporate oncology principles.

Surgical oncologists have the dual responsibility, indeed the obligation, to be role models and consultants in both surgical care and oncology care. In addition, we must teach other surgeons and surgical residents how to incorporate oncology principles into their practices. Are we doing that well enough? Recently, I analyzed the topics most frequently failed on the American Board of Surgery's oral examination and found, much to my dismay, that oncology topics were the least understood by recent graduates of surgical training programs. These data corroborate my impression, after examining hundreds of candidates for the American Board of Surgery, that a significant number have only a rudimentary knowledge of oncology. Some of these candidates could not address such straightforward issues as when to give tamoxifen in patients with node-positive breast cancer. A frequent reply to such a question was, "I would refer the patient to a medical oncologist for all those decisions."

Medical oncologists, by their practice and training, are positioning themselves to coordinate cancer treatment from the time the diagnosis is first established. From the medical oncologist's perspective, almost every patient with cancer has metastatic disease (at least subclinically), and therefore, almost everyone will potentially benefit from systemic therapy. Most surgeons would not necessarily agree with this perspective, since many of our patients with cancer are cured after appropriate surgery. Nevertheless, it is the medical oncologist who is increasingly perceived by the public as "the oncologist."

It is also a medical oncologist who, increasingly, is coordinating the tumor boards in hospitals and who is providing much of the intellectual leadership for clinical trials involving adjuvant therapy (with the notable exception of surgical leadership in the National Surgical Adjuvant Breast and Bowel Project). Indeed, medical oncologists have incorporated the rigor of clinical trials into every aspect of their patient care, at university medical centers, in their training programs, and in community practice as well. We should compliment them on their foresight and ask the question, "Why shouldn't surgeons be more involved in shaping the future of cancer through clinical trials?"

Table 1.—Oncology Staffing

Specialty	No. of Physicians	No. of Training Programs
Surgical oncology	1000	12
Medical oncology	6000	166
Radiation oncology	2500	75

Radiation oncologists provide an important form of local and regional cancer therapy. Often, radiation therapy is used after surgery to improve local disease control rates (eg, rectal cancers and breast cancers) or even before surgery to reduce tumor bulk (eg, some head and neck cancers). Sometimes, irradiation is used as an alternative to surgical excision of a cancerous organ (eg, gastric lymphoma or laryngeal carcinoma). Radiation oncologists usually work closely with medical oncologists and surgeons, but more often, in general, with the former.

ONCOLOGY MANPOWER ISSUES

We also need to examine manpower issues if we are going to ask the question, "What is the surgeon's role in coordinating cancer care in the 21st century?"

The first thing we can say is that surgical oncologists will *not* directly provide cancer care for the majority of patients with cancer. After all, there are only 1000 members of our society, and if one adds the membership of all other specialty societies of surgical oncology, the number still would not exceed 2500. Our surgical oncology specialty is about one eighth the size of our medical oncology and radiation therapy counterparts (Table 1). Shouldn't we at least consider increasing the number of surgical oncology specialists?

Let me see if I can graphically illustrate this issue by examining the number and distribution of oncologists in Texas. Figure 1 shows the locations and number of surgical oncologists who are members of the Society of Surgical Oncology. There are 76 members in Texas, of whom 80% are located in Houston. Clearly, these members of our society cannot provide all the cancer surgery needed by the nearly 17 million people in Texas. What influence do these surgical oncologists have on general surgical training in Texas? Not enough, since a Society of Surgical Oncology member is on the teaching faculty of only 50% of the general surgical residency programs in Texas.

The map in Fig 2 shows the number and locations of board-certified surgeons. Manpower is adequate, and the surgeons are distributed throughout the state. Keep in mind, however, that, on average, only one quarter of a general surgeon's practice involves cancer operations. The map in Fig 3 shows the number and location of the 255 medical oncologists in the state. Note that medical oncologists are located throughout Texas, including small to medium communities in which there are board-certified surgeons but no surgical oncologists. While it was not fea-

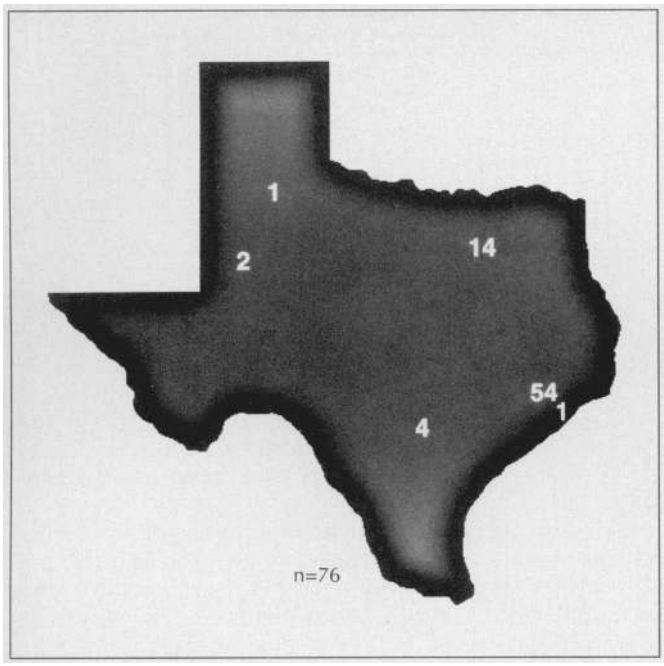

Fig 1.—*This map shows the number and geographic location of members of the Society of Surgical Oncology (SSO) who live in Texas. Approximately 80% of the 76 members of SSO practice in the Houston metropolitan area. These data demonstrate that surgical oncologists are not located throughout the state and cannot provide clinical care for all patients with cancer in Texas (source: scientific programs of the 45th Annual Cancer Symposium of the Society of Surgical Oncology).*

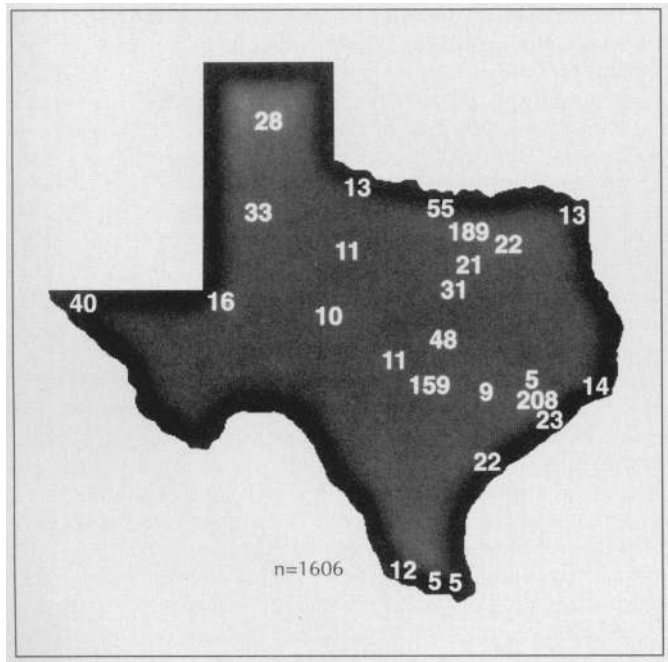

Fig 2.—*There are 1606 board-certified surgeons practicing in Texas. A partial listing of the number and geographic location of these surgeons is shown on the map. These surgeons are located throughout the state, but, on average, devote approximately one quarter of their surgical practice to cancer surgery (source:* ABMS 1991 Directory of Certified Surgeons. *Evanston, Ill: American Board of Medical Specialties).*

sible to study data from other states, it is reasonable to assume that this manpower analysis for Texas is representative of the situation nationwide.

The data thus show that the majority of cancer care in Texas and presumably throughout the United States is being coordinated by community surgeons, medical oncologists, and radiation oncologists or all three in a partnership on behalf of the patient with cancer. However, if surgeons are not educated in oncology and do not take the time to coordinate cancer care, this responsibility will fall by default to medical and radiation oncologists. I do not believe such a situation is in the best interests of patients with cancer who then lose the benefit of a surgeon's expertise in treatment planning and decision making.

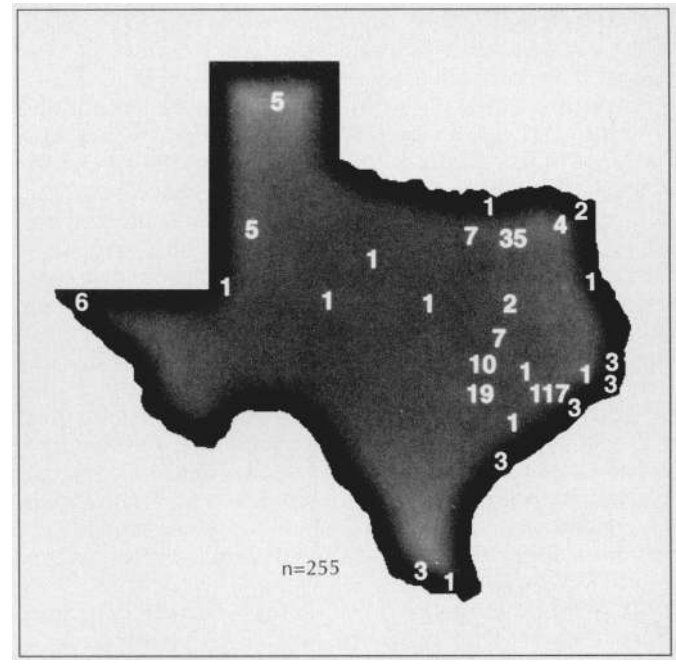

Fig 3.—*There are 255 medical oncologists practicing in Texas. A partial listing of the number and geographic location of these surgeons is shown on the map. While approximately 40% of medical oncologists practice in the Houston metropolitan area, the remainder are located throughout the state, including small to medium communities (source:* ASCO Membership Directory 1991. *American Society of Clinical Oncology).*

SURVEY OF MEDICAL ONCOLOGISTS' PERSPECTIVES ON CANCER SURGERY PRACTICE

Let's examine some practice and training issues from the medical oncologist's perspective. Recently, I mailed a survey to medical oncology training directors and received a 55% response (91 of the 166 program directors). This is a logical group to survey for they provide the educational leadership that will impact the next generation of medical oncologists in the 21st century.

The vast majority of medical oncology fellows (93%) rotate on radiation therapy services (Table 2). However, only 14% of medical oncology training programs include a regular rotation on surgical services (Table 2). An additional 20% have elective rotations. The most common form of rotation was "conferences." It is clear, therefore, that the exposure of most medical oncology trainees to cancer surgery is minimal. It was even more unlikely that a surgical trainee would have any formal exposure to medical oncology (Table 3). The oncology education for surgical trainees apparently comes from surgical oncologists or surgical educators with variable experiences in oncology. The schism here is obvious. Medical oncologists and radiation oncologists have developed common educational goals and objectives that largely exclude exposure to surgery as a cancer treatment, and surgical trainees have minimal ex-

Table 2.—Medical Oncology Training Directors Survey: Do Medical Oncology Fellows Rotate on Radiation Therapy or Surgical Services?

Frequency of Rotation	Positive Responses, %	
	Radiation Therapy	Surgery
Regularly	60	14*
Occasionally	33	20*
Never	7	66

*Most assignments were conferences.

Table 3.—Medical Oncology Training Directors Survey: Do Surgical Oncology Fellows, Surgical Fellows, or Surgical Residents Rotate on Your Medical Oncology Service?

Frequency of Rotation	Positive Responses, %
Regularly	7
Occasionally	8
Never	85

posure to the principles of medical and radiation oncology. This dichotomy is simply not in the best interest of the patient with cancer.

Next, the survey asked about the extent to which surgeons should be involved in providing adjuvant systemic therapy and other cancer treatments (Table 4). The majority of the medical oncology training directors (63%) believed that surgical oncologists should be involved in administering hormonal therapy, but only 46% believed they should be involved in administering chemotherapy. Only a small proportion of directors believed that general surgeons should be involved in these activities (Table 4).

When asked whether the role of cancer surgery would change by the year 2000, their responses were interesting (Table 5). Between 21% and 30% thought the role of surgery would be enhanced for sarcomas, lung cancer, colorectal cancer, and melanomas, but 22% to 39% thought surgery's role would be *reduced* for prostate cancer, breast cancer, head and neck cancer, pediatric cancer, pancreatic cancer, and ovarian cancer. When asked why surgery would play a diminished role in treatment, 74% of the responding medical oncology training directors stated that "surgery would be eliminated with advances in radiation therapy or chemotherapy" (Table 6).

When interpreting these survey results, keep in mind that the orientation and interactions of the medical oncologists during their training were much more with the radiation therapists than with the surgeons. Another explanation for these survey results is that many medical oncologists significantly underestimate the treatment value and overestimate the morbidity of cancer surgery. Clearly, we must acquaint them more about the value of surgery as a cancer treatment.

FUTURE TREATMENT OF PATIENTS WITH CANCER

I believe we are at a crossroad in the treatment of patients with cancer. As we approach the 21st century, surgeons, including members of this society, will need to decide how much oncology to incorporate into their practice and into surgical training. The medical oncologists and radiation oncologists must also fully incorporate principles of cancer surgery into their training, including a formal exposure to patients undergoing surgery for cancer, at least on an outpatient basis.

Table 4.—Medical Oncology Training Directors Survey: In Your Opinion Should a Surgeon Be Involved in the Following Cancer Treatments?

Treatment	% of Medical Directors Responding Yes or Occasionally	
	Trained Surgical Oncologist	General Surgeon With Major Emphasis in Cancer
Hormonal therapy	63	40
Adjuvant chemotherapy	46	22

Table 5.—Medical Oncology Training Directors Survey: By the Year 2000 What Do You Think Will Be the Role of Surgery as a Cancer Treatment Compared With Its Present Status?

Role of Surgery	Positive Responses, %
Surgery enhanced	
Sarcoma	30
Lung cancer	29
Colorectal cancer	24
Melanoma	21
Surgery diminished	
Prostate cancer	39
Breast cancer	33
Head and neck cancer	33
Pediatric cancer	30
Pancreatic cancer	30
Ovarian cancer	22

Table 6.—Medical Oncology Training Directors Survey: If You Marked That Surgery Would Be Reduced, What Are Your Reasons?

Reason	% of Directors Citing Reason
Radiation therapy replacing surgery for local treatment	38
Chemotherapy replacing the need for surgery	36
Surgery too morbid and disfiguring	18

The worst-case scenario is that surgeons will not keep abreast of the rapidly advancing treatments in oncology and that the medical oncologists will continue with their present perspective that surgery will play a diminished role in the treatment of many types of cancer. What will be the consequences of inaction or lack of proactive leadership in the surgical community if we do not fully incorporate oncology management into our practice? Table 7 lists those types of cancer that general surgeons and general surgical oncologists currently treat that could be referred to other board-certified surgical specialists for the technical aspects of their cancer surgery.

Thus, general surgeons and surgical oncologists could very well lose their future referral base for many cancers if our expertise is confined just to the technical aspects of cancer surgery and does not incorporate the broader issues

Table 7.—Erosion of Surgical Oncology and General Surgery Practice	
Disease Site	Other Board-Certified Specialists Who Provide Patient Care
Breast cancers	Gynecologists
Soft-tissue tumors	Orthopedic surgeons
Skin cancers	Dermatologic surgeons
Head and neck cancers	Otolaryngologists/head and neck surgeons
Gastrointestinal cancers	Colorectal surgeons
Esophageal cancers	Thoracic surgeons

of oncology management. Our role could then be confined to the management of abdominal cancers. While I am not suggesting that this will happen on a national scale, most surgeons would recognize that the onset of this erosion in general surgery and general surgical oncology has already begun in many communities and academic institutions throughout the nation.

Clinical trials of adjuvant therapy are another area that illustrates the problem of inadequate surgical oncology involvement. Nationally, there is insufficient interest on the part of the National Cancer Institute and our medical oncology colleagues who lead Cancer Cooperative Groups regarding surgery quality control issues. I can cite examples from three randomized adjuvant therapy trials for melanoma, lung carcinoma, and gastric carcinoma that, in retrospect, did not fulfill surgical quality control criteria and in which patients had significantly lower survival rates than those in patients with cancer who had appropriate surgery.

There are two messages here. First, many of our medical oncology colleagues do not understand that proper surgery can have an impact on survival or they would pay more attention to incorporating surgical quality control into these trials. Second, some surgical educators have failed to train surgeons who can obtain reproducible surgical results. This is yet another area in which this society should exert greater leadership in defining standards of care, including full implementation of surgical quality control criteria into all adjuvant therapy trials.

There is a best-case scenario for our specialty and for the care of patients with cancer. In this case, surgeons would incorporate more knowledge about oncology into their practice and would also advocate a greater exposure to cancer surgery during the training of medical oncologists and radiation oncologists. To do this, we will have to do five things to enhance our specialty of surgical oncology: (1) continue providing optimal surgical care to our patients, (2) participate more in coordinating all aspects of adjuvant cancer therapies (before and after surgery); (3) provide more educational leadership to both surgeons and other oncologists about the indications, risks, and benefits of cancer surgery; (4) participate more in research (clinical and laboratory); and (5) increase the number of surgical oncologists.

Most of these goals are self-evident, but the last two cannot be overemphasized if we are to avoid erosion of our specialty. That is, we must participate even more fully in clinical and laboratory research because today's successful cancer research will affect the standard treatment of tomorrow, and we must facilitate an increase in the number of surgical oncologists who will be able to provide leadership in cancer education and research.

THE ROLE OF THE SOCIETY OF SURGICAL ONCOLOGY

This society and its members bear a significant responsibility, for the society is the logical organization, by virtue of its membership and focus, to provide the leadership in cancer care, cancer research, and cancer education within both the surgical and oncology communities. What should the Society of Surgical Oncology do as an organization? First, we must have a vision and a plan for the 21st century. I wholeheartedly endorse the expanded mission statement (appendix) and the strategic plan that were developed this year by Peter Deckers, MD, and the Issues Committee along with input from the Executive Committee. (A copy of the SSO Strategic Plan is available by request.) The strategic plan reflects a vital future direction for our society that is proactive and visionary. It incorporates a comprehensive educational role in both surgery and oncology. It also strongly advocates basic and clinical research and begins to address our manpower shortage.

Educational Issues

Educational issues are an important component of our mission. We must continue to strengthen the annual meeting format so that it addresses the diverse educational needs of all our members, including those in specialties such as thoracic surgical oncology, pediatric surgical oncology, orthopedic oncology, head and neck surgical oncology, neurosurgical oncology, urologic oncology, reconstructive oncology, and others. Many changes in the annual meeting were introduced this year to increase the quality and breadth of both scientific and educational presentations. I want to thank Raphael Pollock, MD, William Wood, MD, Alfred Cohen, MD, and their committee members, who have all worked very hard during the past year to make this meeting such a success.

Other educational issues include the following: (1) developing more oncology educational materials sponsored by the society; (2) developing standards of care for relevant cancer disease sites (the standards of care document for breast cancer that was completed this year by David Winchester, MD, and the Standards of Care Committee is an excellent example of the impact we can have in setting standards); (3) increasing our educational impact on the training of surgical residents and medical students by strengthening our liaison with the educational organizations directly responsible for surgical training, such as the Residency Review Committee, the American Board of Surgery, and the Association of Program Directors in Surgery; (4) increasing our impact in continuing education for practicing surgeons by closer liaison with the Commission on Cancer and the American Cancer Society; and (5) developing a stronger liaison with the American Society of Clinical Oncology, the American Society of Therapeutic Radiation Oncologists, and oncology training directors to give a more surgery-oriented perspective to trainees in medical oncology and radiation oncology.

Surgical Residency Training

Surgical residency training is an area in which the society and its members must be more involved if we are to have an impact on the next generation of cancer surgeons. All surgical educators must incorporate more about oncology management into surgical residency training. We

must also increase the cancer surgery experience for residents who will actually practice cancer surgery so that they will be more specialized at the completion of their residency. There is presently a significant dilutional effect by the practice of allowing those chief residents whose career goals will lead them into cardiovascular surgery, plastic surgery, or other surgical specialties to perform major cancer surgeries (eg, pancreatic, liver, and pelvic surgery) even though they will never again perform these complex cancer operations in their practice. Finally, at least one surgical oncologist should be on the teaching staff of every surgical residency training program.

Research Issues

Research issues are also critical. We should continue to advocate greater surgical participation in basic science research and in clinical trials, including promulgation of surgical quality control criteria. Other issues include the following: (1) promoting the training of surgical scientists; (2) providing direct support for research fellowships, such as the Beecham Fellowship, which the society began to support in 1992, thanks to Glenn Steele, MD, and the Research Committee; and (3) advocating more research funding from federal agencies and other organizations. This also includes helping our members submit a larger number of competitive grant applications.

Manpower Issues

The shortage of surgical oncologists should be addressed as well. I believe we must increase membership in the Society of Surgical Oncology by recruiting qualified applicants from all surgical oncology fields. We took a big step forward this year by taking in 143 new members from seven different surgical specialties. I want to thank Bernard Gardner, MD, and the Membership Committee for their efforts in reviewing these applications.

Another vitally important manpower issue is the need to increase the number of clinical fellowships accredited by the Society of Surgical Oncology. Presently, only 28 fellows complete their training each year from society-approved programs. No one knows how many we should be training in the future, but I believe that 28 graduates fall far short of the manpower needs for the next decade. I would urge those of you in academic surgery departments, including those in subspecialty oncology disciplines, to consider developing a surgical oncology fellowship and then applying for Society of Surgical Oncology accreditation. This is the only way we are going to meet even a modest goal of producing 50 or more graduates annually. Marshall Urist, MD, and the Training Committee are working hard on this issue.

Why should we change? This is not an issue of "turf" or economic preservation or elevation of the status of the Society of Surgical Oncology. We are here today to explore ways to better serve our patients with cancer, not only those we personally care for but also those treated by all surgeons, now, and in the future. To do this, we must be maximally effective partners as surgeons, oncologists, educators, and researchers as we move into the 21st century. It is for our patients!

APPENDIX: SOCIETY OF SURGICAL ONCOLOGY MISSION STATEMENT

- The Society will develop and promulgate optimal standards for multidisciplinary care of cancer patients. Such standards will include specific cancer control plans (strategies) regarding prevention, early detection, surgical as well as adjuvant therapies, rehabilitation, and follow-up in tumor systems of surgical interest.
- The Society will promote and support outstanding programs of education and training in surgical oncology for students, residents, fellows, practicing surgeons, and the lay public.
- The Society will actively foster, promote, and support outstanding clinical and laboratory research of interest to surgeons and surgical oncologists.
- The Society will actively support and strengthen positive and cooperative relationships with selected major oncology societies, other surgical oncology specialties, the American College of Surgeons, department chairmen in surgery, public policymakers, the private medical corporate community, and the lay community-at-large.
- The Society will preserve and actively enhance its organizational and financial strength.
- The Society will assume a leadership role in oncology by defining not only efficient and expeditious, but cost-effective, strategies of importance in the provision of quality cancer clinical care, education, and research as part of a comprehensive cancer control plan.
- The Society will enhance communication with its members and will actively inform all health care providers of its programs, strengths, and resources.