

# The distinctive features of surgical oncology as a specialty: considerations for Chinese surgeons

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**Abstract:** In China, as in the United States and other countries, cancer patients will increasingly receive more than one modality of treatment delivered by cancer physicians from different medical specialties (e.g., internal medicine and surgery). In the United States and in many other countries, the surgical specialization, known as “surgical oncology” has grown as an essential part of cancer care delivery in the United States, both in academic medical centers and in the majority of cancer centers and hospitals in the local community. At a broad level, one can define the roles and responsibilities of a surgical oncologist as follows: (I) an excellent surgeon who can safely manage cancer patients through complex operations and have the judgment to know what operations to select; (II) knows how to integrate surgical treatment as part of a multidisciplinary team, including the type and timing of surgery after pre-operative systemic therapies and/or radiation therapies; (III) participates as an oncologist in the long-term disease-management of cancer patients; and (IV) participates in cancer clinical research and/or translational research. Perhaps the most compelling reason for surgical specializations is the evidence from multiple studies in the United States and Europe that “high volume” cancer centers and surgical specialists have better outcomes for treating complex or advanced cancers. It is important for all surgeons treating cancer patients to keep up to date with advances in oncology and be a partner with medical and radiation oncologists in providing contemporary multidisciplinary cancer care and to participate actively in cancer clinical trials where they are available. The uniqueness of our specialty is to function as both a surgeon and an oncologist in the management of the surgical patient with cancer.

**Keywords:** Surgical oncology; global medicine; training; outcomes

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It has been estimated by the World Health Organization that by 2030, surgical diseases will contribute significantly to the burden of global health. The treatment of cancer at its best involves a multimodality approach for local control with surgery and radiation and systemic control with a variety of oral and intravenous medications. Likewise patient characteristics as well as awareness, physician preferences, hospital type and country (1-3) impact on the care given for a particular cancer (4,5).

Cancer care is evolving from one of generalized cancer care by a single surgical oncologist to one of personalized

cancer care by a multidisciplinary oncology team. As a consequence some but not all surgical oncologists have increasingly become specialized in one or two diseases within the United States. This philosophy of training has not rapidly advanced globally and has not been practical in rural areas of United States. How does the practicing surgeon therefore incorporate new devices, diagnostics and treatment modalities into their surgical practice? More importantly do we need to train the next generation surgeons in a different way? These issues need to be addressed not only in the United States but globally by the oncology

leadership of all nations. In this context, some perspective about how the issues of surgical specialization and the role of the surgeon in contemporary cancer care here in the United States may be helpful in framing discussions about what is taking place in China and other countries around the world.

### Challenges to effective cancer control globally

In countries with rapidly improving economies, where a large majority of the populace resides in rural areas, cancer is becoming an escalating health problem worldwide (6). This is especially true for large countries like China with a population of over 1.3 billion. China published their first cancer prevention and control plan in 1986 and published results demonstrate that cancer mortality in the highest risk rural areas decreased during the following five-year period (7). The Ministry of health developed a second-stage to the national Cancer Control Plan during the period 2004 to 2010 and was successful in showing a one per cent per year reduction in the incidence of smoking in men (8). A long-term plan for 2005 through 2015 mandated and integrated a comprehensive approach for cancer (9). China has more than doubled the total Healthcare expenditure to 357 billion dollars during the past 4 years (10) and the percentage of population covered by medical insurance has increased to over 95 percent (11). The question then becomes how to train surgical oncologist to take care of this increasing population of patients? Given the success of the preventive strategies of China, could likewise training be improved by adding care pathways specific to general surgical oncology or even a particular cancer?

### Definition of a surgical oncologist

Although surgical treatment is the centerpiece of our specialty, what differentiates surgical oncology from other areas in surgery is the oncology experience and expertise needed in dealing with all aspects of cancer management in a multidisciplinary fashion. The salient feature of differentiation is that surgical oncology is both a technical and cognitive specialty involving a chronic disease process (12).

At a broad level, one can define the roles and responsibilities of a surgical oncologist as follows: (I) an excellent surgeon who can safely manage cancer patients through complex operations and have the judgment to know what operations to select; (II) knows how to integrate surgical treatment as part of a multidisciplinary team, including

the type and timing of surgery after pre-operative systemic therapies and/or radiation therapies; (III) participates as an oncologist in the long-term disease-management of cancer patients; and (IV) participates in cancer clinical research and/or translational research (11). Thus, the surgical oncologist is a dual specialist—both a surgeon and an oncologist—who can incorporate the advances in oncology management into their surgical management, which in many, if not most cancer patients involves frequent use of preoperative and postoperative chemotherapy, biological therapy and radiation therapy in various combinations and sequences (13).

### Surgery and surgical oncology training paradigm

Presently general surgical training is evolving in terms of what we see for the future to meet an ever increasing demand within the United States for qualified and well-trained surgeons without unduly extending the time to train them. The first of the changes to be implemented was early specialization where after basic training one could specialize in the area of their choice, that is early tracking into a particular specialty. In addition there have been changes to the surgical environment with less work hours and a change in how we train residents. In the new paradigm residents are required to pass certain mile stones before being allowed to operate or even advance to the next level of their training. These might include a certain level of knowledge and being able to demonstrate proficient performance of an operation or surgical task or simulators (14).

As defined by the ACGME training requirements and a subspecialty board of the American Board of Surgery (ABS) in what is now termed the discipline of Complex General Surgical Oncology. It is mandated that training include 80 percent surgical management which would cover approximately 15 percent upper GI, 15 percent hepato-pancreatic-biliary, ten percent colorectal, ten percent endocrine, 15 percent breast, ten percent of a group including melanoma, cutaneous malignancies, and sarcoma, and five percent other miscellaneous surgical treatments such as regional therapies, palliation, pain therapy, and end of life issues. Also included in training are ten percent medical and radiation oncology, five percent patient counseling, four percent clinical research and trial design and one percent community outreach (15). Further to this in areas that have super specialized training such as Colorectal that has its own member board of the American Board of Medical Specialties. Other subspecialties that have huge organizations without specific ABS board certification

such as breast and hepato-pancreatico-biliary which are certified by their respective individual organizations. What has not been included in surgical training for the most part has been to incorporate well will have opportunities into such fellowship training programs.

Grigorian and colleagues note the need to incorporate global health opportunities into residency training programs and they propose international electives to address some of this need. Such initiatives can help trainees develop a heightened awareness of the social determinants of health in resource-limited areas, as well as gain insight into different cultures, health beliefs, and pathologic conditions, rely less upon technology, while further developing residents' physical examination and communications skills (16). The Society of Surgical Oncology in a new International program has invested significantly in an exchange program for countries around the world to not only give fellows from other countries a chance to visit multiple training institutions within the United States but allow for a true exchange for Surgical Oncology Fellows in the United States to train in other countries such as China.

### **The value of surgical oncology in multidisciplinary cancer care and research**

Surgical oncology training should not only encompass education on national policies and implementation of prevention programs but training to educate the population on attitudes to cancer in the specific area population base and overcome barrier attitudes to cancer, also to educate the local community health care providers to communicate strategies for cancer prevention, screening, and treatment. This is really basic leadership training in terms of what oncologist can do in a particular community and is perhaps one of the most important aspects of the training of a surgical oncologist. We also need to not only provide research available from a national research strategy basis but also to promote local research to assess differences in cancer biology in terms of acceptability of treatment and response (6).

### **Better outcomes for surgeons who specialize**

Perhaps the most compelling reason for surgical specializations is the evidence from multiple studies in the United States and Europe that "high volume" cancer centers and surgical specialists have better outcomes for treating complex or advanced cancers. Variation in performance is related to several surgeon characteristics, including how often they

perform a given procedure (volume), subspecialty certification, and the hospital setting in which they operate; thus surgeon factors predict rates of postoperative complications and even cancer outcomes after selected surgical procedures (17-19). For example, of 27 studies examining surgeon outcomes based on training and specialization, 25 found that specialized surgeons had better outcomes for cancer surgery than non-specialized surgeons (19).

These findings are most compelling for surgical management of the GI cancers and their metastases to the liver. For example, one study suggested a key role of experience in surgical skill and sensitivity for early stage diagnosis in gastric cancer survival (20). Reductions in hospital mortality and length of hospital stay by high volume and/or specialized centers have also been shown pancreatic, colorectal and liver cancers (21-23).

Many studies have shown the benefits of specialist care and particularly a multidisciplinary approach in the management of breast cancer including improved survival (24). Yet even in the UK where specialized breast units with specified quality control measures have been in place for decades surgeon and unit volume have a marked influence on patient management and treatment (25).

These outcomes results should not be interpreted that all cancer patients need to be treated by specialists. However, with ever increasing technical skills needed as well as in depth knowledge of genomics and genetics, training of residents in surgical oncology as well as training of the surgical oncologist specialist takes on new importance to not only improve early detection but know when to treat and not over treat as well as involve multiple specialties as necessary to improve the patient's outcome.

### **Conclusions**

Regardless of the surgical specialty, and level of training, it is important for all surgeons treating cancer patients to keep up to date with advances in oncology and be a partner with plastic surgeons, radiologists, pathologist, geneticists, medical and radiation oncologists in providing contemporary multidisciplinary cancer care and to participate actively in and promote cancer clinical trials where they are available. The uniqueness of our specialty is to function as an oncologist that operates.

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