



## Editorial: Updating the Operative Standards for Cancer Surgery Key Questions

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Not all patients with cancer are eligible for curative-intent surgery. Those who enter it with great hope and trust that it will be conducted in accordance with best practices and will inherently optimize their likelihood of cure. In reality though, not all surgery is the same and not all surgery is high-quality. The Operative Standards for Cancer Surgery (OSCS) is a multivolume text that was created by the American College of Surgeons (ACS) Cancer Research Program with the aim of standardizing and optimizing cancer surgery across community and academic centers.<sup>1–3</sup> The OSCS is structured to contain critical elements, synoptic operative report templates, and key questions in cancer surgery. Volume 1 covered disease sites of breast, lung, pancreas, and colon.<sup>1</sup> Volume 2 covered thyroid, esophagus, gastric, rectum, and melanoma.<sup>2</sup> Volume 3 became available in August 2022 and covers sarcoma, adrenal, neuroendocrine, urothelial, and hepatobiliary.<sup>3</sup>

As stated in the preface of volume 1 of the OSCS, “there is evidence of what is effective and there is accompanying variability in the actual practice.”<sup>1</sup> While the reasons for this variability in practice are multifactorial, individual surgeon training and experience is likely a major factor. Surgery is learned to a minor degree from textbooks, but mostly from demonstration, practice, and experience, all of which are highly individualized. In general surgery training, the overarching, ingrained goal is to become a safe surgeon. Once this is achieved, the skills developed are

taken either directly into general practice or into further specialty training. While specialty training programs do provide an opportunity to further refine technical skills and gain experience with uncommon and complex operations, the primary aim is not to again learn technical skills focused on safety. Rather, it is to learn the comprehensive treatment of patients and become familiar with and fluent in the process of continuing medical education as it pertains to that field.

In real-world practice, cancer surgery is performed by general surgeons as well as specialty trained surgeons, and among them surgeons who trained recently and surgeons who trained decades ago. The OSCS critical elements clearly define the minimum standards or key steps of cancer operations, from skin incision to closure, that are thought to directly affect oncologic outcomes. These elements are inclusive of steps involved both in disease extirpation as well as in reconstruction and restoration of normal bodily function with minimization of complications. By clearly defining these minimum standards for cancer operations, the OSCS were meant to serve as a reference to all surgeons regardless of training background, as well as to investigators who design cancer clinical trials that include surgery. The OSCS also provide a brief discussion of existing data supporting each critical element and an assessment of the quality of the data. The critical elements serve to form the ACS Commission on Cancer (CoC) surgical standards. In 2020, CoC standards on sentinel lymph node biopsy and axillary dissection for breast cancer, wide excision of melanoma, colon resection, lung resection, and total mesorectal excision for rectal cancer (standards 5.3 through 5.8) were incorporated, all of which were based on OSCS critical elements.<sup>1</sup>

An additional component of the OSCS similarly based on the critical elements are the synoptic operative reports. Synoptic operative reporting in accordance with the

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**TABLE 1** List of Annals of Surgical Oncology manuscripts written to update key questions from OSCS volumes 1 and 2

Author	Year	Title
OSCS volume 1 key questions		
Chun <sup>9</sup>	2016	Role of Radical Antegrade Modular Pancreatosplenectomy (RAMPS) and Pancreatic Cancer
Gray et al. <sup>10</sup>	2018	Intraoperative Margin Management in Breast-Conserving Surgery: a Systematic Review of the Literature
Hennon and Landreneau <sup>11</sup>	2018	The Role of Segmentectomy in the Treatment of Early Stage Non-small Cell Lung Cancer
Zhu L., et al. <sup>12</sup>	2018	Axillary Lymphadenectomy in Sentinel Lymph Node-Positive Breast Cancer
Kasumova and Conway <sup>13</sup>	2018	The Role of Venous and Arterial Resection in Pancreatic Cancer Surgery
Ali et al. <sup>8</sup>	2018	Timing of Surgical Resection for Curative Colorectal Cancer with Liver Metastasis
Nasir et al. <sup>14</sup>	2018	Endobronchial Ultrasonography/Endoscopic Ultrasonography: When Should Negative Endobronchial Ultrasound Findings Be Confirmed by a More Invasive Procedure?
Paquette et al. <sup>15</sup>	2018	Impact of Proximal Vascular Ligation on Survival of Patients with Colon Cancer
Erickson et al. <sup>16</sup>	2018	Minimally Invasive and Open Approaches to Mediastinal Nodal Assessment
Volume 2 key questions		
Cleary et al. <sup>17</sup>	2018	Controversies in Surgical Oncology: Does the Minimally Invasive Approach for Rectal Cancer Provide Equivalent Oncologic Outcomes Compared with the Open Approach?
Cools-Lartigue and Ferri <sup>18</sup>	2019	Should Multidisciplinary Treatment Differ for Esophageal Adenocarcinoma versus Esophageal Squamous Cell Cancer?
Gartland R. and Lubitz C. <sup>19</sup>	2018	Impact of Extent of Surgery on Tumor Recurrence and Survival for Papillary Thyroid Cancer Patients
Halverson et al. <sup>20</sup>	2019	For Patients with Early Rectal Cancer, Does Local Excision Have an Impact on Recurrence, Survival, and Quality of Life Relative to Radical Resection?
Hieken et al. <sup>21</sup>	2019	The Role of Completion Lymph Node Dissection for Sentinel Node-Positive Melanoma
Hughes et al. <sup>22</sup>	2018	Prophylactic Central Compartment Neck Dissection in Papillary Thyroid Cancer and Effect on Locoregional Recurrence
Mogal et al. <sup>23</sup>	2019	In Patients with Localized and Resectable Gastric Cancer, What Is the Optimal Extent of Lymph Node Dissection-D1 versus D2 versus D3?
Ramay et al. <sup>24</sup>	2019	What Constitutes Optimal Management of T1N0 Esophageal Adenocarcinoma?
Tseng and Posner <sup>25</sup>	2020	For Gastroesophageal Junction Cancers, Does an "Esophageal" or "Gastric" Surgical Approach Offer Better Perioperative and Oncologic Outcomes?
Yeung et al. <sup>26</sup>	2020	How Many Nodes Need to be Removed to Make Esophagectomy an Adequate Cancer Operation, and Does the Number Change When a Patient Has Chemoradiotherapy before Surgery?

College of American Pathology recommendations is required this year at CoC-accredited sites (standard 5.1).<sup>1</sup> This format and requirement is another means to promote standardization and optimization of cancer surgery nationwide. By including key data elements in prespecified terminology, it is hoped that this reporting format will remind providers to consider what are the critical elements of the surgery being performed and will result in discrete data for facile abstraction and analysis. With past narrative and unstructured operative reports, it is not possible to determine whether critical elements of surgery are being performed.

The process of developing the critical elements highlighted that not all aspects of cancer surgery are well informed by high-quality data. Areas where data are lacking or controversial were developed into key questions.

These were written in the form of comprehensive systematic reviews with approximately one to three key questions per disease site.<sup>1-3</sup> The key questions were intended to generate further study or clinical trials, and in the more recent OSCS volumes were written in patient, intervention, comparison, outcome (PICO) format to make them clearly assessable by reproducible studies.<sup>2,3</sup>

A major challenge faced with the OSCS is dissemination. The manuals were originally written as printed books, and the first two volumes sold approximately 3200 copies each. To improve dissemination and allow for updating of contents, the critical elements are being transitioned to a web-based format. They have also been incorporated into Surgical Counsel on Resident Education (SCORE) curriculum, are available through OVID, and have been made available as individual sections by disease site.<sup>4-7</sup> The key

questions require continuous reevaluation and updating as additional pertinent primary data become available. This has been done in the form of updated systematic reviews published in the *Annals of Surgical Oncology*. Multiple key questions from volumes I and II have already been updated into manuscripts and are summarized in Table 1.<sup>8–26</sup> Now that OSGS volume 3 has been completed, a continued series of ASO articles will ensue. The current issue contains the first article in this renewed effort, entitled, “Oncologic Components of HIPEC: Key Question: In patients with gastric or colorectal adenocarcinoma metastatic to the peritoneum, does cytoreductive surgery (CRS) plus hyperthermic intraperitoneal perfusion with chemotherapy (HIPEC) prolong survival or increase the risk of complications relative to CRS alone?”<sup>27</sup>

The OSGS is a unique and important resource that is likely underutilized. With this editorial and the upcoming series of articles, we hope not only to update highly relevant key questions in cancer surgery but also to draw attention to this important publication and more effectively disseminate the OSGS to surgeons across the nation and the world. Surgery is different from other components of cancer treatment such as chemotherapy and radiation. It cannot be entirely standardized and so is more difficult to formally study. There will always be patient factors such as age, performance status, and comorbidities that may alter decision-making in how a curative-intent cancer operation is to be conducted. Safety is first and foremost in surgery, and a surgeon may, for example, elect against a modified D2 lymphadenectomy for gastric cancer in an elderly patient if it is felt to introduce more risk than benefit. We should make every effort though to carry out the critical elements in curative-intent cancer surgery. Reasons to omit them should not be things such as surgeon inexperience or unawareness of the elements. If a surgeon is concerned about performing a step such as appropriate lymphadenectomy for gastric cancer or peri-adventitial dissection of the superior mesenteric artery for pancreatic cancer because of their own inexperience or skill level, then they should either seek further experience or training in the technique or refer those patients to a high-volume center where the operation can be performed in accordance with standards. In surgical treatment of potentially curable cancer, we cannot only be safe but need to be both safe and effective. In terms of controversial or uncertain topics, we need to stay current and aware of present-day data and ongoing trials. This can be difficult to do with the abundance of literature available on cancer treatment. The upcoming series of articles will effectively summarize existing data on highly relevant questions in cancer surgery. We hope that they will aid readers in difficult clinical

decision-making and potentially provide basis for prospective surgical trials, which are greatly needed to advance cancer care.

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