

EDITORIAL

American College of Surgeons Commission on Cancer Standard for Curative-intent Pulmonary Resection



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For the first time, the Commission on Cancer (CoC), a quality program of the American College of Surgeons, included six operative standards in its 2020 accreditation standards, Optimal Resources for Cancer Care. The inclusion of operative standards is a significant advancement, and means that surgeons and pathologists at CoC-accredited facilities will now be required to adhere to standards regarding the manner in which certain operations are conducted and documented. These operative standards are based on critical elements of cancer operations as described in *Operative Standards for Cancer Surgery*, volumes 1 and 2, and are meant to establish evidence-based standards for the conduct of cancer operations in the United States.

The following editorial focuses on CoC Standard 5.8 for curative-intent resection of primary pulmonary malignancy. We offer a summary of Standard 5.8, and relevant data on which it is based, in hopes of improving implementation in 2021 and improving compliance, which will first be assessed during site reviews taking place in 2022 (Figure 1). We also describe best practices for pathologists, registrars, and surgeons to achieve these compliance goals, with additional linked video resources.¹

COG OPERATIVE STANDARD 5.8

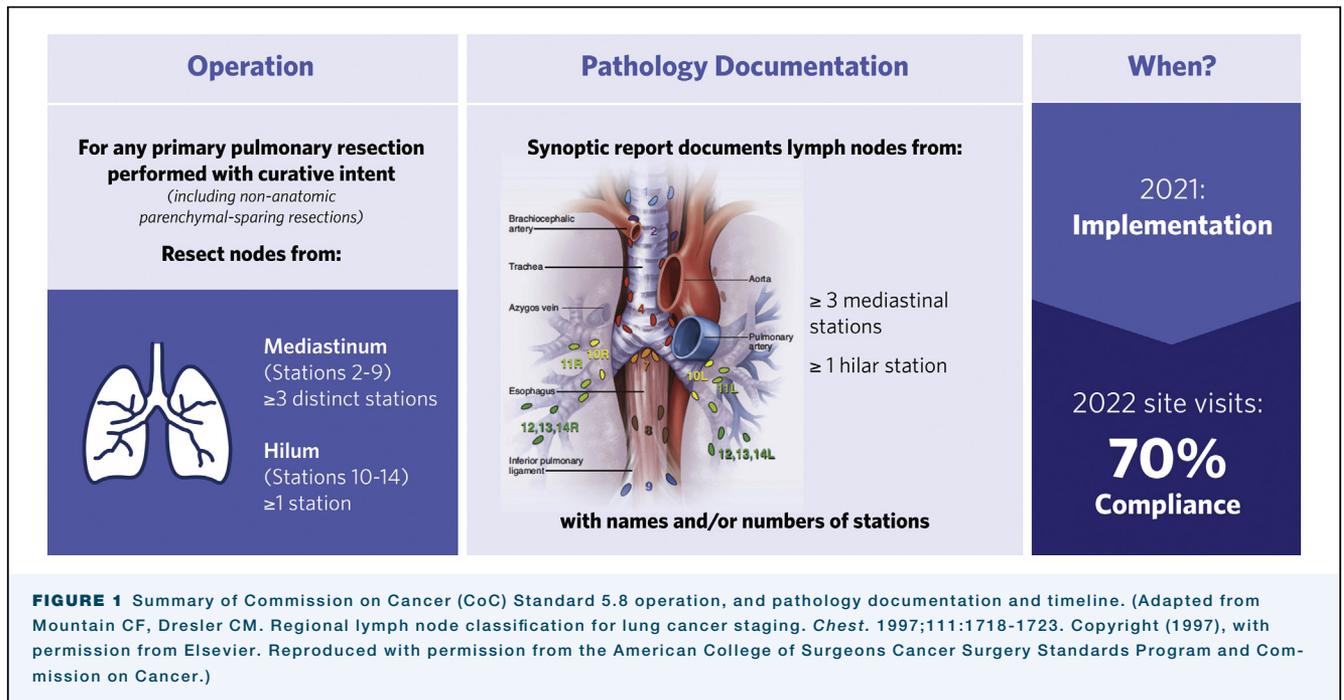
COG STANDARD 5.8. For any curative-intent resection of primary pulmonary malignancy (including nonanatomic parenchymal-sparing resections), resection should include nodes from three or more distinct mediastinal nodal stations (stations 2 to 9), and one or more hilar station (stations 10 to 14). Nodal

stations examined by pathologists after any curative-intent pulmonary resection must be documented in pathology reports in synoptic format, specifically in the College of American Pathologists synoptic report. All nodal stations examined must also be named or numbered, and that must be documented in the pathology report.

MEASURES OF COMPLIANCE

At the 2021 accreditation site visit, the site reviewer will review seven pathology reports for curative-intent pulmonary resections. If a program has fewer than 7 patients who meet the patient criteria for a specific standard, then all patient charts meeting the criteria will be reviewed by the site reviewer. To be compliant with the standard, (1) pulmonary resections for primary lung malignancy include lymph nodes from at least one (named or numbered) hilar station and at least three distinct (named or numbered) mediastinal stations; and (2) pathology reports for curative-intent pulmonary resection document the nodal stations examined by the pathologist documented in synoptic format. An example is shown in the linked reference.¹

TIMELINE. As of January 1, 2021, CoC-accredited cancer programs must meet compliance with this standard. Site reviews in 2022 will evaluate 2021 documentation to determine whether 70% of reviewed pathology reports for eligible patients meet the requirement for Standard 5.8. The compliance rate will increase to 80% beginning with 2023 site visits (reviewing 2021 and 2022 pathology reports).



RATIONALE. The CoC operative standards are evidence based and were implemented to improve surgical care for cancer patients. Standard 5.8 is based on data that systematic lymph node assessment has a positive impact on survival after curative-intent resection of primary pulmonary malignancy. Recently, in a prospective trial of sequentially more stringent nodal sampling criteria among more than 2000 patients with non-small cell lung cancer, increased nodal sampling and sampling from at least three mediastinal nodal stations were each associated with improved survival, most strikingly among pN1 patients with at least three mediastinal stations sampled.² This survival benefit of systematic mediastinal lymph node sampling was preserved regardless of the extent of pulmonary resection.

More comprehensively, the National Comprehensive Cancer Network guidelines for surgical resection of non-small cell lung cancer recommend (1) anatomic resection, (2) negative margins, (3) examination of hilar and intrapulmonary nodes, and (4) examination of three or more mediastinal nodal stations. In a study comparing patients whose resection met all of these criteria with patients for whom one or more criteria was missed, those undergoing standard-compliant resections showed significantly improved survival.^{1,3} Of note, American College of Surgeons CoC Standard 5.8 does not require, or apply specifically to, anatomic resections, but applies to any curative-intent resection, including nonanatomic or wedge resections. These and other studies demonstrate the importance of systematic

lymph node sampling, specifically sampling of nodes from at least one hilar and at least three mediastinal lymph nodes stations, as required by Standard 5.8.^{2,4,5}

Standard 5.8 is a significant departure from the prior lung cancer CoC quality metrics, specifically moving away from a requirement for at least 10 lymph nodes, and instead to systematic sampling of lymph nodes stations. Previous concerns were raised regarding the reliability of a metric focused on the number of lymph nodes rather than on which nodal stations are evaluated.⁶ Recognizing these concerns, Standard 5.8 calls for systematic lymph node sampling rather than a specific number of lymph nodes resected, based on a growing body of literature that systematic mediastinal lymph node evaluation improves survival.^{2,3,7}

While systematic mediastinal lymph node sampling clearly has an impact on survival, there is no additional benefit of full mediastinal lymphadenectomy. The American College of Surgery Oncology Group (ACOSOG) Z0030 demonstrated equivalence of systematic mediastinal lymph node sampling versus formal mediastinal lymphadenectomy, with regard to overall survival, local, and distant recurrence-free survival.⁸ Therefore, Standard 5.8 does not require complete mediastinal lymph node dissection, but sampling of nodes from at least three mediastinal and at least one hilar station.

Despite the benefits of systematic nodal sampling, mediastinal lymph node sampling at the time of curative-intent resection lung cancer is frequently inadequate. In the study of National Comprehensive

Cancer Network guideline-compliant resections,³ only 51% of patients underwent hilar nodal sampling, and just 17% underwent operations meeting all four criteria. Of note, there was a substantial improvement over time, from 2% to 39% at conclusion.³ Prospectively collected Surveillance, Epidemiology, and End Results registry data again confirmed the high frequency of inadequate mediastinal staging, and that patients who did not undergo mediastinal lymph node sampling had reduced overall and cancer-specific survival.⁷ Subsequent examination of data from the National Cancer Database has confirmed improvements in lymph node sampling among patients with early stage lung cancer, and that this is correlated with improved survival.⁴ These data underscore the importance of CoC Standard 5.8 and its dissemination.

Of note, Standard 5.8 applies to any curative-intent lung cancer resection, including nonanatomic parenchymal-sparing resections, recognizing the potential benefit of nonanatomic pulmonary resection in patients with marginal pulmonary function or favorable tumor characteristics. Previous investigations have demonstrated less extensive lymph node assessment in patients undergoing sublobar resections, which has significant staging and therapeutic implications.⁹ Standard 5.8 addresses these observations by requiring mediastinal and hilar lymph node assessment regardless of the extent of curative resection.

In addition to improvements in lymph node sampling, Standard 5.8 aims to improve compliance with synoptic reporting of pathologic nodal examination. The pathology report serves as the documentation on which staging and postoperative treatment are based, yet discordance between operative reports and pathology reports frequently occurs.⁵ The use of a checklist format distinguishes the College of American Pathologists synoptic reporting format from narrative reporting, and synoptic formatting has been shown to improve accuracy and completeness of documentation. That is of paramount importance as incorrect staging may lead to stage migration, inappropriate patient counseling, and even inappropriate selection of adjuvant treatments. Of note, CoC Standard 5.1 (College of American Pathologists synoptic reporting) requires that 90% of eligible cancer pathology reports

are structured using the CAP synoptic reporting format, so that should not be a new requirement for cancer programs.

BEST PRACTICES FOR COMPLIANCE. Although the ultimate measure of compliance to Standard 5.8 will be based on pathology reporting, it is dependent on communication between surgeons and pathologists. First, surgeons must document whether pulmonary resections for cancer are done with or without curative intent in their operative report. Without this important piece of information, the standard may be incorrectly applied to cases with palliative intent, where systematic nodal sampling would not be expected.

Second, a pathologist's ability to correctly document examination of at least three mediastinal and at least one hilar lymph node station is dependent on surgeons both performing adequate sampling and labeling nodal stations clearly and separately. For simplicity and reproducibility, we encourage surgeons to send each lymph node station in separate, labeled specimen containers. Whether lymph nodes stations are resected separately, or resected en bloc and separated ex vivo, is left to surgeon discretion. (Additional information, including technical aspects of lymph node resection, can be found at: <https://www.facs.org/quality-programs/cancer/cssp/resources.1>)

The effectiveness of using pre-labeled specimen collection kits, checklists, and sending lymph node stations in separate containers has been examined, confirming that this strategy resulted in a dramatic increase in the number of mediastinal nodes examined in pathologic reporting (1 vs 6), and improved concordance between operative and pathologic reports (39% vs 80%).^{10,11}

CONCLUSION. Despite improvements in lung cancer care, there remains substantial need for wider adoption of quality standards and systematic pathology reporting. Simple methods for separate lymph node station collection and labeling appear to narrow the communication gap between surgeons and pathologists. Dissemination of evidence-based best practices for the CoC operative standards is critical for implementation at CoC accredited cancer programs, with the ultimate goal of improving the quality lung cancer care nationwide.

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