Stereotactic body radiation therapy (SBRT) has emerged as a safe and effective treatment modality for selected patients with non-small cell lung cancer (NSCLC) (1). Compared with other radiation techniques, SBRT is delivered with fewer fractions of higher-dose radiation that are directed more precisely at located targets, providing a higher biologically effective dose while minimizing toxicity to the surrounding normal tissue. Since the introduction of SBRT to clinical practice more than a decade ago, there has been growing interest in its role in the treatment of NSCLC, as demonstrated by the increasing number of publications on SBRT in the literature (Figure 1) (2–4). Historically, clinical data on SBRT were from patients with significant comorbidities who were not suitable surgical candidates (4). However, recent studies have expanded the patient cohort to high-risk surgical candidates who can tolerate either surgical resection or SBRT (5,6). The authors of a retrospective subgroup analysis of two prematurely terminated randomized controlled trials commented that SBRT may even be superior to lobectomy, in terms of overall survival, for early-stage operable candidates—a claim that is challenged by most surgeons (7,8).

From a surgical perspective, the most important clinical question addressed by the ASTRO guidelines relates to the patient selection process for operable patients with T1-2, N0 NSCLC. The guidelines make three key recommendations for this patient cohort.

(I) Patients with stage I NSCLC should be assessed by a thoracic surgeon for operability.

(II) For patients with standard operative risk and stage I NSCLC, SBRT is not recommended outside of a clinical trial.

(III) For patients with high operative risk and stage I NSCLC, discussions about SBRT should be encouraged, and SBRT should be considered an alternative treatment to surgery.

Further qualifying statements by ASCO point out the lack of randomized data comparing SBRT to lobectomy or sublobar resection, the limited long-term data on SBRT guidelines were produced by a task force approved by ASTRO and are based on a literature search from 1995 to April 2017. The guidelines specifically address a number of key clinical questions, separated primarily by the operability of the patient cohort. For operable surgical candidates, when is SBRT appropriate for patients with T1-2, N0 NSCLC? For nonoperable surgical candidates, when is SBRT appropriate for patients who have tumors of a particular size, location, or with synchronous or multifocal presentation and who have had previous surgery or radiotherapy?
beyond 5 years, and the difficulty of assessing and defining operative risks.

Several key challenges remain to identify the appropriate role of SBRT for operable patients. First, there is a paucity of robust long-term data on locoregional control for SBRT beyond 5 years. This becomes more important as life expectancy increases in an aging population and as SBRT is offered to younger patients. A patient should be fully informed of the lack of long-term data on SBRT, especially compared with established surgical outcomes from historical data. Future studies should strive to obtain long-term clinical data with clearly defined clinical and radiographic follow-up regimens to assess for locoregional control. Second, there is a heterogeneous requirement for histologic confirmation before treatment with SBRT, especially in Europe, where up to 60% of treated patients have no recorded histologic diagnosis (10). This likely has an influence on overall, disease-free, and cancer-specific survival, to an unknown extent. To address this issue, the ASTRO guidelines strongly recommend that clinicians obtain a biopsy before treatment with SBRT to confirm that a nodule is malignant in nature. However, they also provide a moderate recommendation to allow SBRT in patients who refuse or fail biopsy or are considered to have prohibitive risks for biopsy after discussion within a multidisciplinary team. Another consideration when comparing SBRT to surgery is that much of the surgical data originated from historical records before the introduction of minimally invasive surgery (11). Abundant evidence suggests VATS produces superior perioperative outcomes and similar if not superior long-term outcomes compared with open thoracotomy (12,13). Future comparative studies of SBRT versus surgery need to include higher proportions of patients who undergo VATS lobectomy or segmentectomy and mediastinal lymph node dissection/sampling, which is the standard treatment for operable patients with early-stage NSCLC (14). Finally, it should be acknowledged that there are limited data on quality of life and cost-effectiveness outcomes between SBRT and surgery.

In summary, ASTRO and ASCO should be commended for producing a set of guidelines in a timely manner to help guide physicians and surgeons in their clinical practice and to update the available clinical data on SBRT. We agree that it is absolutely necessary for a thoracic surgeon to assess a patient with resectable NSCLC before consideration of SBRT. We acknowledge that there is a significant and perhaps growing role for SBRT for high-risk patients who are considered inoperable or very high risk for perioperative adverse outcomes. These patients should, in our opinion, have a pretreatment histologic diagnosis and have long-term clinical and radiographic follow-up to assess for locoregional control after SBRT. Although the ASCO Expert Panel considers the recommendations from these guidelines to be clear, thorough, and based on the most relevant clinical evidence, they also note a lack of strong evidence for many of the recommendations in the guidelines. Therefore, they emphasize the importance of shared decision making between surgeons, physicians, patients, and their families. With maturing long-term data and the initiation of more carefully designed prospective studies, we hope that the role

Figure 1 Number of publications on stereotactic body radiation therapy for the treatment of non-small cell lung cancer by year, as indexed by PubMed.
of SBRT will become better defined in the future.

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Footnote

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