

radiation and ablation procedures, the Eurolung risk model becomes an important tool to help us select the most appropriate therapy for our patients.

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Commentary: Eurolung score as a predictor of long-term survival: It is not all about the tumor

Taryne Imai, MD,^a and Benny Weksler, MD^b

Thoracic surgeons must care for an aging population with lung cancer, and lung resection in elderly patients has become relatively common.¹ With increased patient age comes increased comorbidities and frailty. It is intuitive that survival in elderly patients with lung cancer is not dependent on traditional TNM staging alone. Scores evaluating comorbid conditions and frailty have been shown to predict surgical mortality and also may correlate with long-term survival.²⁻⁵ These studies illuminate the need for a thorough evaluation of candidates for lung resection that includes careful assessment of nononcologic measures that may determine survival independent of TNM cancer staging.



Taryne Imai, MD, and Benny Weksler, MD

CENTRAL MESSAGE

The Eurolung score may correlate with overall and disease-specific survival after curative resection of lung cancer. This may assist surgeons during shared decision making with patients.

From the ^aDivision of Thoracic Surgery, Department of Surgery, Cedar Sinai Medical Center, Los Angeles, Calif and ^bDivision of Thoracic and Esophageal Surgery, Department of Thoracic and Cardiovascular Surgery, Allegheny General Hospital, Pittsburgh, Pa.

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Address for reprints: Benny Weksler, MD, Division of Thoracic and Esophageal Surgery, Department of Thoracic and Cardiovascular Surgery, Allegheny General Hospital, 320 E North Ave, 14th Floor, South Tower, Pittsburgh, PA 15212 (E-mail: benny.weksler@ahn.org).

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In their article in this issue of the *Journal*, Brunelli and colleagues⁶ provide a retrospective review of a prospectively collected database evaluating the Eurolung risk score and patient survival after curative resection for lung cancer. Although the Eurolung score was developed to stratify the risk of postoperative 30-day morbidity and mortality in patients undergoing lung resection, the authors applied the model to investigate its association with long-term survival.⁶ A total of 1359 consecutive patients who underwent potentially curative (R0) anatomic lung resection for non-small-cell lung cancer were analyzed, with a median follow-up of 802 days. Patients were categorized into 4 risk classes according to their calculated Eurolung scores. The authors found that 3-year overall survival and 3-year disease-specific survival decreased as the Eurolung score risk class

increased. Multivariable analysis demonstrated that the association of the Eurolung score with overall and disease-specific survival was independent of pathological T and N stage. The authors concluded that in addition to stratifying short-term morbidity and mortality outcomes, the Eurolung score can be applied to stratify long-term survival outcomes.

The Eurolung risk score is a reliable predictor of complications and perioperative mortality after lung resection.⁷ Brunelli and colleagues add to the literature, presenting the implications of a perioperative risk model on a long-term outcomes metric, as they demonstrate the impact of the Eurolung score on overall survival. The authors also distinguish their work by demonstrating an association between the Eurolung score and lung cancer–specific survival independent of pathological T and N stage. These results add to an increasing number of identified factors that predict survival independent of tumor stage. In addition, although the connections between risk modeling and prognostication are evident, the thoracic surgical community remains uncertain of the best applications of risk prediction models to clinical practice. Should these models serve as metrics for assessing quality of care, enable us to provide more realistic counseling to patients, or guide us in making informed clinical decisions? Furthermore, we have yet to determine whether risk models and scores maintain their validation when applied in different populations globally. The Eurolung score has been shown to have less applicability in populations outside of Europe, for reasons that remain unclear.⁸

The Eurolung is a relatively simple scoring system based on age, predicted postoperative forced expiratory volume in 1 second (ppoFEV₁), body mass index (BMI), sex, open surgery (vs video-assisted thoracoscopic surgery), and extent of resection (pneumonectomy vs others). Its correlation with long-term survival may reflect the contribution of pneumonectomy and open surgery to a high Eurolung score, and also may reflect increased comorbidities in older patients and patients with very low BMI. It would be interesting to assess the performance of the Eurolung score

against established scores of comorbidity, such as the Charlson Comorbidity Index, and frailty scores.^{2,3}

Independent of this model's performance compared with other predictive scores, it is clear to us that careful evaluation and surgical planning are essential to patients' long-term survival. For example, a 70-year old patient with a ppoFEV₁ of 50% undergoing an open pneumonectomy will have a Eurolung score >7. According to the data presented by Brunelli and colleagues, this patient's likelihood of 3-year survival is only 36%. This type of assessment will become mandatory during discussions of surgical options and shared decision making with lung cancer patients. As thoracic surgeons continue to offer curative resection to older patients with higher perioperative risk, we need to be mindful that patient prognosis is multifactorial. Risk prediction models may need to carry more weight during the surgical selection process.

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