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OUTCOMES FOR LVRS: FINDING THE CORRECT LEMONADE RECIPE

Reply to the Editor:

I thank Pompeo and colleagues for their comments regarding our article and their insights on lung volume reduction surgery (LVRS). I also congratulate them on their excellent results in this difficult patient population with an innovative technique. We and our patients have benefited greatly from the sentinel work of Pompeo's group with this disease. Our Society of Thoracic Surgeons (STS) database investigation of LVRS procedures from 2003 through 2011 was in no way meant to dissuade thoracic surgeons from applying this proven therapy, but rather was intended to assess the current state of LVRS's utilization and outcomes in the United States. The STS database has been integral in evaluating outcomes and defining and improving performance standards for procedures in our discipline ranging from coronary artery bypass grafting to lobectomy. Now more than a decade since the initial publication of the National Emphysema Treatment Trial (NETT) data, my coauthors and I believed that it was time to assess LVRS outcomes in a systematic way. Our effort was

particularly motivated by what we perceived as a lack of enthusiasm for the procedure in both the pulmonology and surgical communities. Since the adoption of the Lung Allocation Score for distribution of donor lungs and the subsequent shift in recipients toward a population with fibrotic lung disease, our institution has seen an increasing need for alternative strategies for patients with emphysema. The University of Wisconsin Advanced Lung Disease Program has aggressively applied LVRS in the population with emphysema as a definitive therapy, as opposed to a bridge to transplant. In a review of our institutional data between 2008 and 2014, the 30- and 90-day mortalities were both zero, and the 3-year survival was 96.7% (2008-2012). Postprocedure forced expiratory volume in 1 second, beginning with an average of 790 mL (26% of predicted), increased 480 mL, or an average of 60% above baseline. We have found that the mechanical and subjective improvements were durable, and no patients have crossed over to transplantation since 2008. Our results, similar to those of Pompeo's group, are from a single institution with a mature, robust, and multidisciplinary LVRS program.

The STS database is focused on 30-day outcomes. We concede that the database interrogation does not tell the whole story, especially with regard to the impact of LVRS on long-term survival. We ask this question: Can we expect the outcomes from this STS database query to match the NETT outcomes that have been generated in a more restricted and controlled trial format? In the STS cohort, 27% of patients had absolute exclusion criteria (coronary artery disease or previous chest surgery) to enrollment in the NETT. Hypertension was a potential exclusion from the NETT if it was severe, and it was present as a comorbid condition in 45% of the

STS cohort. In addition, we do not have data regarding the preoperative preparation, including smoking cessation or pulmonary rehabilitation requirements. Perhaps most importantly, the database does not differentiate high-volume, multidisciplinary programs from lower-volume centers. We would expect, as with cancer resection or congenital cardiac surgery, that a relationship exists between volume and mortality.^{1,2} This STS review can help to set expectations for real clinical practice, versus a single-center series or the more constrained patient population included in a clinical trial. As we stated in the article, a more robust review of relative performance measurements for LVRS would allow programs to compare their performance with others and potentially learn from high-performing organizations, such as Pompeo's group. The addition of long-term outcomes, such as 5-year survival, is planned for the STS database and will ultimately provide data regarding longevity of these patients albeit not regarding their quality of life. Both within the United States and internationally, thoracic surgeons who perform LVRS would benefit from a collaborative registry. Without such a tool, it will be difficult to accurately compare outcomes of LVRS with those of evolving and existing bronchoscopic therapies. I very much look forward to seeing the results of multi-institution trials confirming the excellent results documented in single-institution series such as that of Pompeo and colleagues. At the University of Wisconsin, we will continue to aggressively use LVRS to treat a highly selected cohort in an effort to improve the quality of life and increase the longevity of our patients.

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