

See Article page 822.



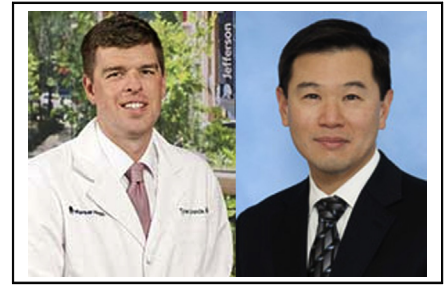
## Commentary: Quantifying “fit for esophagectomy”—Grasping for more metrics

Tyler R. Grenda, MD, MS,<sup>a</sup> and  
Andrew C. Chang, MD<sup>b</sup>

In this issue of the *Journal*, Tang and colleagues<sup>1</sup> present a single-institution prospective study of 77 patients to evaluate a novel composite measure of 4 physiologic metrics (grip strength, timed sit-stands, psoas muscle area to height ratio, and 6-minute walk distance) to predict perioperative outcomes following esophagectomy. The investigators’ measure was then compared with 2 commonly used frailty indices. Overall, the authors concluded that their “Esophageal Vitality Index” outperformed established qualitative frailty indices in prediction of the composite morbidity metric.

At the core of the current study remains the conundrum of variation in surgeon assessment and understanding of frailty.<sup>2,3</sup> Although the literature has established a strong association between frailty and perioperative surgical outcomes, there are limited reports specific to esophagectomy, a procedure associated with considerable morbidity,<sup>4-9</sup> indicating that more accurate assessments are needed to identify patients likely to experience adverse outcomes following esophagectomy. In addressing this knowledge gap, the authors used physiologic metrics to improve the prediction of postoperative morbidity related to esophagectomy.

What do Tang and colleagues<sup>1</sup> add to what has already been established in the literature? Their work provides objective data, assessing patient physiologic function to define “frailty,” and enhances a nebulous myriad of subjective assessments, measures, and scores, specifically in the context of evaluation for esophagectomy. While a single metric is unlikely to replace the surgeon’s intuition of



Tyler R. Grenda, MD, MS, and Andrew C. Chang, MD

### CENTRAL MESSAGE

Physiologic metrics in the form of a novel composite measure add to quantitative and subjective assessments of frailty in patients being considered for esophagectomy.

who may be considered “high risk,” it may serve to complement these evaluations.

While the Esophageal Vitality Index provides quantitative data to support a surgeon’s assessment of functional status, there are some weaknesses. Notably, the authors did not report patient functional status using this measure before neoadjuvant therapy. Changes in preoperative functional status related to such therapy may provide a better assessment of patient resilience to subsequent operative intervention. This is further underscored by previous literature that has demonstrated declines in functional status during neoadjuvant therapy for esophageal cancer.<sup>10</sup>

Nonetheless, Tang and colleagues<sup>1</sup> build a foundation for future efforts aimed at identifying patients at risk for adverse events following esophagectomy. Several questions remain to be addressed, including whether this index or other similar quantitative measures can be used to assess functional status longitudinally, such as during neoadjuvant treatment in patients that are considered to be “marginal” surgical candidates. As the authors indicate in their concluding remarks, indices such as proposed in this study may be useful to identify patients who would benefit most from risk mediation through a “prehabilitation” exercise and nutrition program. Although novel metrics to evaluate functional status are unlikely to displace our current subjective evaluations, they provide additional data to augment our assessment of functional status. The Esophageal Vitality Index, with further validation in larger patient cohorts

From the <sup>a</sup>Division of Thoracic Surgery, Sidney Kimmel Medical College, Philadelphia, Pa; and <sup>b</sup>Section of Thoracic Surgery, Department of Surgery, Michigan Medicine, Ann Arbor, Mich.

Disclosures: The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Nov 13, 2020; revisions received Nov 13, 2020; accepted for publication Nov 16, 2020; available ahead of print Nov 24, 2020.

Address for reprints: Tyler R. Grenda, MD, MS, Division of Thoracic Surgery, Sidney Kimmel Medical College, 1025 Walnut St, Suite 607, Philadelphia, PA 19107 (E-mail: [tyler.grenda@jefferson.edu](mailto:tyler.grenda@jefferson.edu)).

J Thorac Cardiovasc Surg 2021;161:833-4

0022-5223/\$36.00

Copyright © 2020 by The American Association for Thoracic Surgery

<http://dx.doi.org/10.1016/j.jtcvs.2020.11.059>

and refinement as needed, may help surgical teams get a better grasp of functional status for patients being considered for esophagectomy.

## References

1. Tang A, Raja S, Rappaport J, Raymond D, Sudarshan M, Bribriescio A, et al. Looking beyond the eyeball test: a novel vitality index to predict recovery after esophagectomy. *J Thorac Cardiovasc Surg*. 2021;161:822-32.e6.
2. Ferguson MK, Thompson K, Huisingh-Scheetz M, Farnan J, Hemmerich JA, Slawinski K, et al. Thoracic surgeons' perception of frail behavior in videos of standardized patients. *PLoS One*. 2014;9:e98654.
3. Holeman TA, Peacock J, Beckstrom JL, Brooke BS. Patient-surgeon agreement in assessment of frailty, physical function, and social activity. *J Surg Res*. 2020; 256:368-73.
4. Mrdutt MM, Papaconstantinou HT, Robinson BD, Bird ET, Isbell CL. Preoperative frailty and surgical outcomes across diverse surgical subspecialties in a large health care system. *J Am Coll Surg*. 2019;228:482-90.
5. Hodari A, Hammoud ZT, Borgi JF, Tsiouris A, Rubinfeld IS. Assessment of morbidity and mortality after esophagectomy using a modified frailty index. *Ann Thorac Surg*. 2013;96:1240-5.
6. Shah R, Attwood K, Arya S, Hall DE, Johanning JM, Gabriel E, et al. Association of frailty with failure to rescue after low-risk and high-risk inpatient surgery. *JAMA Surg*. 2018;153:e180214.
7. Hirpara DH, Kidane B, Rogalla P, Cypel M, de Perrot M, Keshavjee S, et al. Frailty assessment prior to thoracic surgery for lung or esophageal cancer: a feasibility study. *Support Care Cancer*. 2019;27:1535-40.
8. Sandini M, Pinotti E, Persico I, Picone D, Bellelli G, Gianotti L. Systematic review and meta-analysis of frailty as a predictor of morbidity and mortality after major abdominal surgery. *BJS Open*. 2017;1:128-37.
9. Sheetz KH, Zhao L, Holcombe SA, Wang SC, Reddy RM, Lin J, et al. Decreased core muscle size is associated with worse patient survival following esophagectomy for cancer. *Dis Esoph*. 2013;26:716-22.
10. Guinan EM, Doyle SL, Bennett AE, O'Neill L, Gannon J, Elliott JA, et al. Sarcopenia during neoadjuvant therapy for oesophageal cancer: characterising the impact on muscle strength and physical performance. *Support Care Cancer*. 2018;26:1569-76.

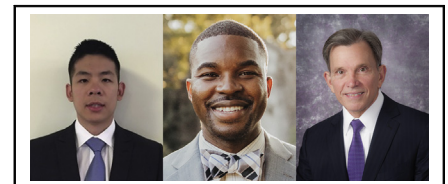
See Article page 822.



## Commentary: Surgical risk assessment in 2020: Is a handshake and a walking test really the best we've got?

Ernest G. Chan, MD, MPH,  
Chigozirim N. Ekeke, MD, and  
James D. Luketich, MD

Minimally invasive approaches to many disease processes, including esophageal cancer, can help lower the risk of morbidity and mortality.<sup>1</sup> Accurate preoperative assessment is a key component in stratifying patients who present to clinic for possible esophagectomy. These tools allow both medical oncologists and general thoracic surgeons the ability to predict the outcomes of various treatment plans,



Ernest G. Chan, MD, MPH, Chigozirim N. Ekeke, MD, and James D. Luketich, MD

### CENTRAL MESSAGE

There is a need for better pre-operative assessment in patients undergoing esophagectomy. The Esophagectomy Vitality Index is a novel system that assesses physical status and fitness in these patients.

including multimodal therapy and esophagectomy, and identify nonsurgical candidates. An accurate predictive assessment might also help us decide when a period of physical rehabilitation and medical “tune-up” might be considered when the initial risk assessment appears concerning. While the literature has presented many methods for assessing surgical candidacy,<sup>2-6</sup> there continues to be a need to improve our preoperative assessment tools, since esophagectomy continues to be associated with major morbidity and mortality even in the era of minimally invasive esophagectomy.<sup>7</sup>

From the Department of Cardiothoracic Surgery, University of Pittsburgh School of Medicine and the University of Pittsburgh Medical Center, Pittsburgh, Pa.

Disclosures: Dr Luketich owns stock in Intuitive Surgical and Express Scripts. All other authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

Received for publication Nov 11, 2020; revisions received Nov 11, 2020; accepted for publication Nov 12, 2020; available ahead of print Nov 20, 2020.

Address for reprints: James D. Luketich, MD, FACS, Department of Cardiothoracic Surgery, University of Pittsburgh, School of Medicine, C800 PUH, 200 Lothrop St, Pittsburgh, PA 15213 (E-mail: [luketichjd@upmc.edu](mailto:luketichjd@upmc.edu)).

*J Thorac Cardiovasc Surg* 2021;161:834-5  
0022-5223/\$36.00

Copyright © 2020 Published by Elsevier Inc. on behalf of The American Association for Thoracic Surgery

<http://dx.doi.org/10.1016/j.jtcvs.2020.11.040>