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EDITORIAL COMMENTARY

“Moving right along” after lung resection, but the data suggest “not so fast”

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During the last decade, there has been a boom in the interest of “fast track surgery,” with numerous studies comparing standard perioperative care with enhanced recovery pathways (ERPs). The expectation is that ERPs will accelerate recovery, improve patient outcomes, and decrease hospital stay without increasing readmissions. In a meta-analysis of 38 trials of ERPs across all surgical subspecialties, ERPs reduced overall complication rates and hospital stay.¹ Leading the way with fast track surgery is colorectal surgery, accounting for 18 of these 38 trials. A recent Cochrane review of 4 highly selected colorectal surgical randomized, controlled trials (RCTs) again showed a reduction in overall complications and stay for those treated with ERPs.² Importantly, there was no difference in the readmission rate between the 2 groups.² Despite these findings, the trials were deemed to be of low quality, and the reviewers cautioned against widespread implementation of ERPs.² The literature surrounding ERPs in thoracic surgery is of even lower quality than that of colorectal surgery.

In this issue of the *Journal*, Fiore and colleagues have undertaken the task of completing an exhaustive literature search to identify the best evidence regarding ERPs for elective lung resection. Second, the authors should be applauded for comparing 6 disparate articles, an endeavor

that is akin to comparing not just apples and oranges but apples to zucchini, because the methodologies for each study were vastly different. Finally, the authors’ use of a descriptive approach is laudable, because the results of a true meta-analysis would be uninterpretable.

A common theme throughout this systematic review is that of biases affecting the results of ERP studies. There has been only a single RCT of ERPs in thoracic surgery, and it showed a decreased risk of pulmonary complications in the ERP arm (7% vs 36%) but no differences in overall morbidity or mortality.³ As Fiore and colleagues astutely

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Central Message

Current evidence is insufficient to support implementation of enhanced recovery pathways in thoracic surgery.

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point out, however, the RCT investigators did not describe the randomization scheme or treatment allocation strategy, 2 critical steps in designing and implementing RCTs. These steps ensure that each subject enrolled has an equal opportunity to be assigned to either group, thereby preventing selection bias. In the nonrandomized studies, it is highly likely that ERPs lead to improved outcomes because thoracic surgeons are choosing patients who are better candidates for fast tracking. The major challenge with an ERP trial is the inability to blind the patients and the hospital staff caring for them. The knowledge that a patient is in the intervention arm can be a significant motivating factor for all parties involved and may lead to a spurious association between ERPs and improved outcomes. One way to circumvent this bias in part is to blind the outcome assessment for each subject. In other words, members of the health care team who are unaware of a subject's treatment arm should use objective criteria to assess the primary and secondary outcomes.^{4,5} Furthermore, rather than measuring stay, subjects should be evaluated for readiness for discharge, because this would reduce the effect of systems-based obstacles to discharge.

The colorectal surgery ERPs may have been more successful because those pathways are novel compared to standard care. For example, preoperatively, probiotic use, omission of oral bowel preparation, carbohydrate loading, and much shorter duration of fasting before surgery are significant deviations from the norm for bowel surgery.⁶ Intraoperatively, transverse incisions (as opposed to midline incisions) and the avoidance of nasogastric tubes and other drains were part of the ERP. Finally, postoperatively, colorectal patients in the ERP could have clear liquids on postoperative 0 and a regular diet the following day.⁶ In contrast, surgical care improvement measures such as antibiotic prophylaxis and common practice modalities such as epidural analgesia, postoperative fluid restriction, and early mobilization are part of the ERP package in thoracic surgery studies. The ERPs are not dissimilar enough from standard care to elicit a difference in outcome.

Two major potential barriers to fast tracking thoracic surgical patients are (1) pain control and (2) chest tube management. Epidural analgesia is commonly thought of

as the criterion standard for pain management in thoracic surgical patients; however, paravertebral blockade provides similar pain control with decreased risk of pulmonary complications, urinary retention, and hypotension.^{7,8} In addition, patients can be safely discharged home with the paravertebral catheter connected to an autoinfuser. For these reasons, paravertebral blockade may be better suited to fast track pathways. In addition, the use of multimodal analgesia, including acetaminophen and nonsteroidal antiinflammatory drugs can reduce the amount of narcotics needed, thereby mitigating side effects.⁸ Chest tube management is commonly subject to thoracic surgeon preference. Chest tubes without an air leak and with nonchylous fluid output of less than 450 mL/d can be safely removed,⁹ and patients with an air leak but no pneumothorax on water seal can be discharged home with a chest tube. These strategies may facilitate the goal of ERPs.

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