We agree with the concern that "overconsolidation of services could produce access barriers and other unintended consequences," especially in rural areas of the country. We contend that the best way to optimize children's surgical care is to provide a team approach that emphasizes system building by forging alliances with other surgical specialties (including anesthesiology), pediatrician and family practice colleagues, and administrative entities that can provide the essential infrastructure in rural hospitals that care for children.[6] System building is a relatively new concept, different from regionalization, that has the potential to optimize pediatric surgical care even in the face of uncontrolled consolidation.

Competing Interests

Dr. Oldham is the Chair and Drs. Houck, Barnhart, Deshpande, and Fallat are members of the American College of Surgeons Children's Surgery Verification Committee, Chicago, Illinois.

Constance S. Houck, M.D., M.P.H., F.A.A.P., Keith T. Oldham, M.D., F.A.A.P., F.A.C.S., Douglas C. Barnhart, M.D., M.S.P.H., F.A.C.S., F.A.A.P., Jayant K. Deshpande, M.D., M.P.H., F.A.A.P., Mary E. Fallat, M.D., F.A.A.P., F.A.C.S. Boston Children's Hospital, Harvard Medical School, Boston, Massachusetts (C.S.H.). constance.houck@childrens.harvard.edu

The corresponding author of the original article referenced above has read the letter and does not have anything to add in a published reply.

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Obesity and Positive End-expiratory Pressure: Comment

To the Editor:

We read with great interest the recent article by Simon *et al.*[1] In this study, the authors have shown that individualized positive end-expiratory pressure (PEEP) exerts lower driving pressure.[1] This in turn proved the redistribution of ventilation toward dependent lung areas, as measured by electrical impedance tomography. These sound results imply great notions regarding intraoperative respiratory management. However, we highlight four concerns regarding the methodology used.

First, the study combined data from a multicenter[2] and a single-center trial. This was likely to cause selection bias. The inclusion periods were separated at 4-yr intervals. The authors divided the combined cohort into three treatment groups: individualized PEEP, fixed low PEEP, and fixed PEEP of 12 cm H_2O. The differences in the patient characteristics were unclear. The Assess Respiratory Risk in Surgical Patients in Catalonia (ARISCAT) score greater than 44 was noted in one patient (4%) in the individual PEEP group, which is less in comparison with the other two groups. We would like to know whether preoperative pulmonary function (forced expiratory volume in 1 s/forced vital capacity), oxygenation, and partial pressure of carbon dioxide differed among the groups. We question this because capnoperitoneum time and duration of an operation are basic information for considering postoperative pulmonary complications. To us, it seems that these might have influenced the results.

Second, the results clearly demonstrated that the individualized PEEP group needed larger amounts of fluid infusion and doses of vasoactive medication than the other two groups. There was no doubt as to whether these discrepancies were related to pulmonary management

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strategy. We question how intraoperative infusion management strategies differed between the period of the single-center study (2012 to 2013) and the multicenter study (2016 to 2018). Additionally, preoperative oral intake or dose of hypertensive drugs may have differed in the 4-yr interval.

Third, the complications related to individualized PEEP cannot be studied in totality. Hemodynamic depression attributable to excessive PEEP may be a risk factor for patients with cardiovascular diseases. In this study, the transpulmonary pressure was not measured, which could have been used as an alternative parameter for lung injury. It is known that intracranial pressure or perfusion in the brain is largely influenced by PEEP.[3]

Finally, the definition of postoperative pulmonary complications described by the authors was not relevant to the process of early recovery after surgery. The postoperative complications earlier included acute respiratory distress syndrome, bronchospasm, new pulmonary infiltrates, and so on[2]. In our opinion, setting a clinically relevant outcome could be as simple as the need for oxygen therapy, including a low-flow nasal cannula. This approach would resemble ventilator-associated event surveillance for intubated mechanically ventilated patients and in turn support studies for ventilator-associated pneumonia.[4] We wish to know how the length of oxygen therapy differed among the groups after surgery. Additionally, we would like to have information on new relevant criteria that matches the early recovery after surgery concept.

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Competing Interests

The authors declare no competing interests.

Yukiko Suzuki, M.D., Koji Hosokawa, M.D., Ph.D., Yuka Matsuki, M.D., Ph.D. University of Fukui Hospital, Fukui, Japan (Y.S.). ysuzuki@u-fukui.ac.jp

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Obesity and Positive End-expiratory Pressure: Reply

In Reply:

We thank Suzuki *et al.*[1] for their interest in our recent work[2] and would like to address their concerns. The challenge of combining patients of different study protocols spanning several years is a potential bias we noted ourselves.[2] However, the single-center setting means that investigators and surgeons remained the same and the highly elective patients for bariatric surgery only were treated according to clinical standards which remained unchanged during the time. It seems unlikely that positive end-expiratory pressure (PEEP)–dependent physiologic effects were influenced by any minor change over time. Moreover, randomization guarantees that differences within each study are the result of chance alone, and the difference in ARISCAT (Assess Respiratory rIsk in Surgical patients in CATalonia) scores between the groups are both clearly presented and not in the least indicative of a meaningful imbalance in our opinion. In line with our clinical pathway for bariatric surgery and current anesthesia guidelines, lung function measurements were not performed before surgery.[3] Patients with pulmonary disease, cardiac insufficiency, or increased intracranial pressure were not included in either study.

Indeed, duration of anesthesia and the operation differed significantly between groups. However, the individualized

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PEEP group was the one with the greatest duration but also the group with the best intraoperative lung mechanics and the highest oxygenation. Thus, even if the time of mechanical ventilation and capnoperitoneum time influenced our results, this emphasizes even more the necessity of an individual ventilation strategy.

As correctly noted by Suzuki *et al.*,[1] the intraoperative amount of fluid applied was higher in the individualized PEEP group. This arises from a coloading performed by the attending anesthesiologist during the recruitment maneuvers to intercept a drop in blood pressure and from PEEP titration, which increased the duration of anesthesia and thus the time during which the patient was administered fluids. Despite the measured differences in the groups, in all groups it is intraoperative restrictive fluid management.[4] Applying more restrictive fluid infusion targets might further increase vasopressor requirements in obese patients, especially when using high PEEP, and this potential risk must be balanced with potential benefits of minimizing intraoperative atelectasis with higher PEEP.[5] However, only patients scheduled for bariatric surgery were included in the studies in our center, where perioperative procedures (including preoperative oral intake) are highly standardized following the early recovery after surgery concept for bariatric surgery.[3] The protocol was not changed during the study period without any systematic change in preoperative hydration or in dose of hypertensive drugs in the 4-yr interval in question.

Higher PEEP values may lead to cardiovascular instability as a result of impaired venous return, which was reflected in our study by the highest cumulative noradrenaline doses in the individualized PEEP group. However, mean arterial blood pressure did not differ between groups and overall norepinephrine doses were low, so we do not consider this to be a relevant issue in most patients. Excessive PEEP values should, however, be avoided in patients with significant right heart failure, and such patients were excluded in our study. Predefined rescue protocols were available if a PEEP level was not tolerated,[5,6] but none of our patients needed such a rescue protocol. Concerning the influence of PEEP on brain perfusion and intracranial pressure (ICP), an increase in thoracic pressure is partially transmitted to central venous pressure (CVP) and may thus increase venous downstream pressure of the brain. According to the vascular waterfall model of compressible tubes, cerebral venous outflow is only impaired if CVP is greater than ICP. Clinical data have shown that for patients with decreased chest wall compliance, as with our obese patients, higher PEEP had no effect on cerebral hemodynamics.[7]

Transpulmonary pressure was not included in the endpoints of the two original studies because its use as a correlate of lung stress has known limitations.[8] Although electrical impedance tomography enables detection of regional information on overdistension and collapse, regional variations in lung expansion may not be adequately reflected by local pressure measurements in the esophagus. As noted in our article, in the context of predefined low tidal volume, information on regional heterogeneity might be more relevant to identify regions of increased stress as a substrate for postoperative pulmonary complications.

Suzuki and colleagues correctly note that postoperative outcomes differed from those of the original PROBESE (Effect of High PEEP *vs.* Low PEEP on Postoperative Pulmonary Complications in Obese Patients) study. In contrast to the PROBESE-study, our subanalysis was neither intended nor adequately powered to investigate postoperative pulmonary outcomes associated with an individualized ventilation strategy. The early recovery after surgery guidelines discussed the use of adequate PEEP with recruitment maneuvers to reduce postoperative pulmonary complications.[3] Atelectasis plays a significant role in obese patients and should be avoided with regard to ventilator associated complications,[9] The aim of the subanalysis was to investigate the effects of individualized PEEP on ventilation distribution and atlectasis formation with implications for lung function. Because there were no clear instructions when to stop oxygen therapy in the postanesthesia care unit in the single-center study, the duration of oxygen therapy would not be an adequate endpoint. Furthermore, to be able to better classify the results, the endpoints were based on previously published studies on individual ventilation, including one of the two studies included here.[5,10]

We highly appreciate the interest in our work and agree with Suzuki *et al.* that further research is necessary to determine whether the benefits of an individualized ventilation strategy lead to a lower incidence of postoperative pulmonary complications.

Competing Interests

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Philipp Simon, M.D., Felix Girrbach, M.D., David Petroff, Hermann Wrigge, M.D., Ph.D. University of Leipzig Medical Center, Leipzig, Germany (P.S.). philipp.simon@medizin.uni-leipzig.de

P.S. and F.G. contributed equally to this letter.

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Evidence Supporting Anesthesiology Guidelines: Comment

To the Editor:

We have read with great interest the article by Laserna *et al.*,[1] "Levels of Evidence Supporting the North American and European Perioperative Care Guidelines for Anesthesiologists between 2010 and 2020: A Systematic Review," in the most recent issue of Anesthesiology. Without a doubt, this is an issue of great importance, and it is imperative to take actions against this problem. On the other hand, it is worth mentioning that this is not a new problem. In 1994 Altman[2] mentioned the existence of low-quality medical research in his article "The Scandal of Poor Medical Research," and a more recent article by Van Calster *et al.*,[3] "Methodology over Metrics: Current Scientific Standards Are a Disservice to Patients and Society," also takes up this issue, arguing that the main problem is a paradox: "The methodology, the backbone of science, is still too trivialized by the scientific community that finances, undertakes, and informs (pre) clinical research." Although the methodologic approach is important for the resolution of this problem, we do not believe that it is the only one.

In our opinion, a training approach should be emphasized with three points that should be considered:

1. Stop training "doctors" and focus on training "scientists": One of the most basic characteristics of science is