

The lack of an APRV “champion” at the conference, along with misstatements regarding APRV and transpulmonary pressure changes, asynchrony and discomfort, and the benefits of spontaneous breathing in APRV are the points of concern to me. We use APRV in my institution in daily clinical practice and are impressed with its ability to provide lung recruitment, deliver the physiologic benefits of spontaneous breathing, and serve as an effective weaning modality. APRV serves our patients with ALI/ARDS as a combination lung-protective and open-lung modality, and we have been quite pleased with the results.

Brent D Kenney RRT
Respiratory Care Services
St John’s Hospital
Springfield, Missouri

The author reports no conflict of interest in the content of this letter.

REFERENCES

1. Myers TR, MacIntyre NR. Does airway pressure release ventilation offer important new advantages in mechanical ventilator support? *Respir Care* 2007;52(4):452-458.
2. Habashi NR. Other approaches to open-lung ventilation: airway pressure release ventilation. *Crit Care Med* 2005;33(3):S228-S240.
3. Chiang AA, Steinfeld A, Gropper C, MacIntyre N. Demand-flow airway pressure release ventilation as a partial ventilatory support mode: Comparison with synchronized intermittent mandatory ventilation and pressure support ventilation. *Crit Care Med* 1994;22(9):1431-1437.
4. Putensen C, Zech S, Wrigge H, Zinserling J, Stuber F, von Spiegel, Mutz N. Long-term effects of spontaneous breathing during ventilatory support in patients with acute lung injury. *Am J Respir Crit Care Med* 2001;164(1):43-49.

The authors respond:

Brent Kenney raises several issues about our paper,¹ which was part of the 38th RESPIRATORY CARE Journal Conference, “Respiratory Care Controversies in the Critical Care Setting.” We will address his 4 specific points.

1. The format of this series of manuscripts in RESPIRATORY CARE was of a “pro-con” debate. Kenney is concerned that a strong proponent of airway pressure-release ventilation (APRV) was not invited to take the “pro” side. We would argue, however, that a more objective approach is to invite

experts who can synthesize the evidence, not simply extol their beliefs or anecdotal experience. We believe that the data on APRV in our paper were inclusive and that our conclusions about APRV were as evidence-based as possible. Having said that, we would point out that, despite the existence of APRV for over 20 years, the evidence base supporting it is remarkably thin. Indeed a PubMed search for “airway pressure release ventilation or APRV” retrieved only 17 peer-reviewed clinical studies, most of which were observational in nature.

2. We raised 2 concerns about the physiologic effects of APRV that are often overlooked. First, the spontaneous breaths taken at P_{high} add to end-inspiratory transpulmonary pressure and end-inspiratory volume. Though we agree that this extra pressure and volume (stretch) may be small, it is nevertheless still present and should be recognized. Claiming that APRV reduces set airway pressure is often true, but the implication that this translates to lower end-inspiratory stretch may not be true. Second, it is often assumed that the short T_{low} prevents substantial derecruitment. Lung units with short time constants (ie, with poor compliance and low resistance) can easily derecruit in only a few hundred milliseconds. Thus, the potential for derecruitment-rerecruitment lung injury can not be ignored. Our paper did not state that these effects were always harmful; we only wanted to point out that these effects needed to be considered when assessing the potential role of APRV.

3. The data on patient comfort during APRV are difficult to interpret. Studies that have claimed that APRV is “comfortable” generally compared it to assist-control or pure control modes that are more challenging to synchronize with patient effort than are interactive modes such as pressure support. We accept that spontaneous breathing and appropriate functional residual volume may enhance comfort, but there are many more factors involved in optimizing patient-ventilator synchrony.

4. For any new mode to be widely adopted, it must be shown to improve important clinical outcomes, compared to a current “standard of care.” To date only 2 reasonable-sized clinical trials have addressed this. The study by Putensen et al² clearly showed benefit from APRV, compared to their control strategy. However, their control strategy: (1) required paralysis for 3 days, and (2) produced a dramatic drop in oxygenation from the baseline (pre-

randomization). In the current era of ARDS Network management algorithms, that control strategy is clearly not “standard of care.” Thus, no conclusions can be drawn other than that APRV is better than a non-standard control strategy.

A better study was that by Varpula et al,³ who used a more standard synchronized intermittent mandatory ventilation pressure-support control strategy, and between the APRV patients and the control patients there was no difference in sedation needs, ventilator days, or mortality. Until APRV is shown to improve important clinical outcomes, it is difficult to recommend widespread use.

In conclusion, we point out that the question we addressed was whether APRV offered “important new advantages” over current strategies. We believe (and the participants at the Journal Conference agreed) that, though there may be some theoretical reasons why APRV may have some advantages, and a small clinical database suggests that APRV can supply adequate ventilatory support, the notion that APRV offers “important new advantages” remains speculative at present.

Neil R MacIntyre MD FAARC
Division of Pulmonary, Allergy,
and Critical Care
Duke University Medical Center
Durham, North Carolina

Timothy R Myers RRT-NPS
Division of Pediatric Pulmonology
Rainbow Babies and Children’s Hospital
Case Western Reserve University
Cleveland, Ohio

Dr MacIntyre has been a consultant for Viasys Healthcare. The authors report no other conflicts of interest in the content of this letter.

REFERENCES

1. Myers TR, MacIntyre NR. Does airway pressure release ventilation offer important new advantages in mechanical ventilator support? *Respir Care* 2007;52(4):452-458.
2. Putensen C, Zech S, Wrigge H, Zinserling J, Stuber F, von Spiegel, Mutz N. Long-term effects of spontaneous breathing during ventilatory support in patients with acute lung injury. *Am J Respir Crit Care Med* 2001;164(1):43-49.
3. Varpula T, Valtta P, Niemi R, Takkunen O, Hynynen M, Pettilä VV. Airway pressure release ventilation as a primary ventilatory mode in acute respiratory distress syndrome. *Acta Anaesthesiol Scand* 2004;48(6):722-731.