

Bilevel or volume-cycled ventilation?

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Josh Benditt, MD, FCCP



Noah Lechtzin, MD, MHS, FCCP
Photo by Hannah G. Lechtzin

At CHEST, the annual fall gathering of the American College of Chest Physicians, a lively discussion recently ensued between Josh Benditt, MD, and Noah Lechtzin, MD, about whether to use bilevel pressure ventilation or volume-cycled ventilation in people with neuromuscular conditions requiring long-term noninvasive ventilation. Both agreed that unfortunately the decision is driven more by reimbursement issues than what is best for the patient, at least in the US.

Dr. Lechtzin, arguing for the use of bilevel ventilation, stated the advantages as decreasing the work of breathing, improving the gas exchange in the lungs, and improving comfort and compliance. Bilevel units are smaller, lighter, less expensive and more available than volume/pressure control ventilators. The units have fewer alarms and can store usage data. One main advantage is leak compensation, although the exact tidal volume the patient is actually receiving is hard to determine.

Disadvantages of bilevel units include limited O₂ delivery and the inability for the individual to breath stack. There is also the “rent to own” reimbursement phenomenon in the US, in which the patient owns the unit after 13 months but with no assurance of respiratory care services or equipment monitoring.

The BiPAP® AVAPS™ (Average Volume-Assured Pressure Support) ventilator may be more useful for people with progressive disorders – this is a ventilator that can adapt to an individual’s increasing needs for ventilatory support. The AVAPS ensures a preset tidal volume and maintains inspiratory pressure to meet the goal tidal volume.

Dr. Benditt argued for the use of volume-cycled ventilation. (He admitted

that he has personally tried both volume-cycled and pressure-limited methods, and found pressure-limited to be more comfortable.)

Dr. Benditt finds the volume ventilator better for diurnal use, especially with the intermittent mouthpiece positive pressure ventilation system he uses because there are problems with flow triggering and autocycling when attempted with bilevel units. Breath stacking is not possible with a bilevel ventilator, which Dr. Benditt finds highly beneficial to his patients for increasing lung volume and improved cough and speech. Dr. Benditt argued that improving cough function is critical in patients with neuromuscular disease and that cough can be augmented by breathstacking or by other devices such as the mechanical in-exsufflator.

Daytime mask use is becoming more common in people with ALS and DMD. Both Drs. Benditt and Lechtzin recommend a quality of life study in people who use masks 24/7. ▲

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