

Comfortable patients and faster weaning: Some benefits of closed-loop ventilation and the P/V Tool

Interview with Dolly Saunders, RRT, Chesapeake General Hospital

The ability to easily determine and apply appropriate volumes, rates, and PEEP has made a difference in the practice of respiratory care in the adult ICU of Chesapeake General.

Q: Dolly, why did you choose GALILEO ventilators?

A: We had HAMILTON MEDICAL VEOLAR ventilators, and our sales representative, Tim, sold us on what the GALILEO could do, so we upgraded our machines. Since having GALILEOS we have been through many software upgrades through the years, each one providing more options for monitoring and diagnostics. The Gold package has made a huge difference in the care of our patients. The new modes and the P/V Tool are wonderful. We're upgrading our nursery, and we're hoping to get two more GALILEOs.

Q: Tell us about your experiences training your staff on the GALILEO.

A: It is very easy to train on the GALILEO, because it's very user-friendly. We had an initial training, then we set up a skills day for one-on-one training. I put together a program to teach what all the monitored parameters mean and also included basic waveform interpretation. I made laminated index cards for the GALILEOs with initial settings for all the new modes, recruitment maneuvers, our lung protection policy, and the P/V Tool. Now everybody is starting to use that information more. The doctors are beginning to use the new modes more and more.

"We had been trying to wean her for two weeks with conventional methods. With AVtS, it took three days."

Q: Tell us how you went about introducing closed-loop ventilation in your hospital.

A: We tried AVtS with people who were ready to wean. We had typically used pressure support for such patients. When using AVtS, we set the minimum we needed to ventilate, but we didn't go over it. During the day we needed less than during the night. One patient had Hodgkin's disease. She had pleural effusions. It was hard for us to determine how much pressure support she needed. We had been trying to wean her for two weeks with conventional methods. With AVtS, it took three days.

* AVtS is a closed-loop ventilation mode available in the USA. ASV is now available in the USA, too.



Chesapeake General Hospital is a 300-bed hospital in Chesapeake, VA USA. The adult intensive care unit currently has 28 beds. During the day six to seven respiratory therapists and three pulmonologists are on duty. During the night there are four to five respiratory therapists with physicians on call. The adult ICU has 12 GALILEO Gold and five VEOLAR ventilators.

Dolly works as Clinical Educator in the medical and surgical ICU.

They say that patients with neuro problems do not do well on closed-loop ventilation, but we had one patient for whom we had tried every mode, including maximum pressure support. On AVtS the pressure still went up and down, but you could see that he was much more comfortable. His work of breathing and comfort level improved with AVtS.

We have just received a software upgrade and now we have ASV instead of AVtS. It is easier for the staff to use. I am looking forward to discovering all the benefits of this mode.

"Closed-loop ventilation adjusts to what the patient needs at the time"

User Report

Q: Tell me about the benefits you've derived from closed-loop ventilation?

A: Having the ability to increase or decrease ventilation based on patient demand is the biggest benefit. With a conventional weaning method, ventilation is set too high or too low. Closed-loop ventilation adjusts to what the patient needs at the time.

Even if I wasn't using AVtS, I would switch to AVtS to get the OLWB (Otis least work of breathing), then use this information with a conventional mode. I had an OD patient, and following our lung-protective protocol he was on a rate of 30 b/min and a tidal volume of 350 ml, but he was not comfortable and was going to require more sedation. I switched to AVtS to get the OLWB proposal, and it suggested a rate of 12 b/min and a tidal volume of 700 ml, so I switched to A/C and a rate of 12 b/min with a tidal volume of 700 ml. The patient calmed right down and didn't require any sedation.

"You don't have to have the therapist at the bedside when the patient needs a change"

Q: Where do you see the practical benefits of closed-loop ventilation?

A: Staffing. You don't have to have the therapist at the bedside when the patient needs a change. Typically it might be 10 or 15 min before the change is made, whereas with AVtS it is instantaneous. But you also need a little extra time to interpret trending. At least it's not a call-you-away situation.

Q: Have you found that less sedation is needed?

A: Yes, for example with that one neuro patient I mentioned. They were thinking about paralyzing him. It makes a huge difference for the family of one who is dying if the patient is just breathing normally. It makes a huge difference in the care, even if just for the family's psychological benefit.

Q: How satisfied are you with the monitoring you get from closed-loop ventilation?

A: I think it's good, but you have to remember to use trending also. We trend fSpont, fcontrol, pressure – but mainly pressure. Then we want to see whether breaths are spontaneous or control breaths. We leave up the target graphics screen, and then we flip back to trending to see what the patient was doing before.

"The P/V Tool really has made a huge difference in the care of our patients"

Q: Tell us about your experiences with the P/V Tool.

A: The P/V Tool has changed our care the most by allowing us to put the patient on their optimal PEEP setting and determining the ventilator pressure for the patient. I had an obese patient, 30 years old, with acute CHF. He had an MI while we were taking him to the cath lab. My initial settings were Pcontrol of 25 cmH₂O with PEEP of 10 cmH₂O and 100% FiO₂. He was getting a tidal volume of 240 ml with a rate of 25 b/min; his ABGs were pH, 6.98; pCO₂, 72; PO₂, 74; and his Ppeak was 35 to 38 cmH₂O. Once they sedated him for the catheterization, I did a P/V Tool, and it showed that his PEEP should be 22 cmH₂O. When I put his PEEP up to 22 cmH₂O and I had a PC at 10, his tidal volumes increased because the alveoli were open, and I was able to get a tidal volume of 450 ml with Pcontrol of 10 cmH₂O and PEEP of 22 cmH₂O. He was able to ventilate more efficiently with higher PEEP. His repeat ABGs were pH, 7.32; PCO₂, 48; and PO₂, 230.

The P/V Tool has made a huge difference in the care of our patients, especially ARDS patients. You can determine exactly how much PEEP you need and start there. I encourage all our therapists to complete the P/V Tool maneuver right after the initial intubation while the patient is still sedated. We had an 18-year-old patient who went into full-blown ARDS after having a baby. She was off the ventilator in three days. If we had been using the lower levels of PEEP, I don't think we would have gotten her off so fast. The P/V Tool is really accurate and the doctors can see the graph, so they have full confidence in it.

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