Caring Practice: Evidence-based Terminal Ventilator Withdrawal

Q&A From the Live Webinar

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The AACN Critical Care Webinar Series™ is not only an efficient way to learn from true thought leaders within our community; it also serves as the seed of robust discussion among colleagues. To encourage continued discussion, our expert has responded to participant questions not addressed during the live webinar. Please enjoy reading the responses below.

Our expert’s responses to your questions:

Q: In the Respiratory Distress Observation Scale© (RDOS), there is no category that accounts for decreased level of consciousness as opposed to fearful facial expressions. How do you account for this when using the RDOS?

A: The RDOS measures respiratory behaviors; fear is an emotional reaction to respiratory distress that can be observed. Consciousness mediates the patient’s ability to experience and display respiratory distress. That said, some unconscious patients will display behaviors reflected in the RDOS if they are in respiratory distress. Unconscious patients at the lowest end of the continuum (ie, stereotypical responses or no responses) often do not display RDOS behaviors.

Q: Once you have determined the need for oxygen post extubation, are there any limits to how much you deliver? And is there a preferred method of delivery?

A: If the patient meets criteria for supplemental oxygen (RDOS >3, SpO2 <86%), start with low flow by nasal cannula and titrate to RDOS <4. If flow rates reach 4 or more, add humidification. The goal is comfort, so high-flow oxygen or oxygen by face mask may add to patient discomfort. In that case, treating with morphine is preferable to high doses of oxygen.

Q: I’m confused about why a cuff-leak ratio matters. Since this is terminal extubation, why do the calculations for stridor matter? If this is not going to change the plan, would you not treat the stridor as it happens?

A: The goal of ventilator withdrawal is spontaneous, comfortable breathing. Some patients at high risk of stridor may be more comfortable off the ventilator with the endotracheal tube in place. In our pilot study, patients with post extubation stridor had more severe respiratory distress than any other patient in the sample. We can attempt to treat it with racemic epinephrine when it occurs. I take the position that we can always get the patient off the ventilator, but we cannot always extubate.

Q: How much time should elapse between steps in terminal weaning in patients who do not require remedication? Are there recommendations for the rate of weaning PEEP, frequency, and FiO2?

A: About every 2 minutes or so between steps. PEEP can be turned off in one step. I wean FiO2 by 0.2 every 2 minutes, then wean ventilation rate every 2 minutes.

Q: Was the control group (one-step terminal withdrawal) started on preextubation opioids? Could your results be from lack of adequate opioids rather than from the actual process (one-step or wean)?
A: Patients in both groups received morphine as premedication. The control group patients got more lorazepam and little morphine during withdrawal, as well as a one-step process. I posited that both factors (one-step and less morphine) contributed to more distress in the control group.

Q: In your study, the number of ventilator days was almost double that in the control group. Do you think this has an effect on your study results?
A: It may have contributed to the post extubation stridor. I don’t believe it had an effect on distress because the patients were matched in all other variables.

Q: Do you have any comment on terminal vent withdrawals for ALS patients (separate from the patient decision process)?
A: This is a very difficult patient to withdraw, because they often have lost muscle function in the face, neck, and chest and the RDOS is not valid in bulbar ALS. Thus, it is very difficult to know when this patient is in distress. The best I have been able to do is rely on respiratory rate and medicate to maintain a rate <30 breaths/minute.

Q: Should hydromorphone (Dilaudid) be used instead of morphine in a patient with renal insufficiency or renal failure? If so, what should the dosing be?
A: Hydromorphone has not been tested for efficacy to treat dyspnea. The concern about morphine accumulating is justified if you expect the patient to live >24 hours after ventilator withdrawal. Typically, patients in multisystem organ failure, including renal, die rapidly after ventilator withdrawal and the concern about morphine accumulation is moot. If they are expected to live for a day or more, then fentanyl may be a better choice than hydromorphone because there is a small evidence base for fentanyl to treat dyspnea.

Q: What has been your experience with using inhaled morphine for respiratory distress?
A: I have not used morphine by that route. Others have reported bronchospasm and cough. Intravenous is the preferred route.

Q: When assessing consciousness/ability to experience distress, is the sedation turned off? Also, is it suggested to turn sedation off prior to extubation or can a case be made to continue sedation for comfort?
A: That decision is made case by case. The unique circumstances of each case will determine whether sedation should be turned off or maintained. Even with sedation, the patient will need to be monitored for respiratory distress and medicated with morphine if distress is displayed. In our pilot, the control patients were being treated with lorazepam and still displayed respiratory distress.

Q: Why administer just morphine IV post extubation, and not the adjunct therapy of the morphine and lorazepam?
A: Morphine is the evidence-based choice for dyspnea relief. If morphine is effective alone, then you don’t need lorazepam. I suggest using the adjunctive lorazepam if you need to frequently bolus with morphine. Morphine alone is sufficient for many patients.

Q: What is your experience with retained secretions and patient comfort?
A: Large volumes of tenacious secretions can produce an airway obstruction which may be uncomfortable. Side-lying positioning and judicious use of gentle suction are indicated in that circumstance. “Death rattle” is the sound made when a small volume of pharyngeal secretions is
present. We found in a previous study that there is no patient distress from death rattle, and no need for medication. Family teaching about the naturalness of the sound, and the fact that there is no patient distress, is indicated. (See Campbell ML, Yarandi HN. Death rattle is not associated with patient respiratory distress: is pharmacologic treatment indicated? *J Palliat Med.* 2013;16(10):1255-1259.)

**Q:** How do you address diuresis in a hypotensive patient with wet lungs?

**A:** The process of terminal ventilator withdrawal is undertaken because the patient is dying and the goal is a natural death. Concerns about hypotension in this context are negligible.

**Q:** How do COPD and the increase of CO$_2$ levels in this patient affect the RDOS?

**A:** When a COPD patient hits their hypercarbic threshold for distress, the RDOS score will begin to increase. The level of CO$_2$ that produces distress in any person, typically, is 4-5 mmHg above baseline.

**Q:** We are removing prolonged noninvasive positive pressure ventilation more often. I see the opportunity to wean, similar to invasive mechanical ventilation. Would the suggested approach be to achieve the appropriate RLS with medication postremoval of NIPPV the same way as with intubated patients?

**A:** I agree, but I would treat according to the RDOS and not the Reaction Level Scale.

**Q:** Do you need an order to change to terminal weaning, vs a one-step option when terminal extubation is ordered?

**A:** Your hospital may have a policy or procedure that could be reviewed and/or revised based on the evidence from this webinar.