The Development of Prolonged Weaning Guidelines to Facilitate Ventilatory Liberation

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The Development of Prolonged Weaning Guidelines to Facilitate Ventilatory Liberation

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Introduction

- Unsuccessful ventilator liberation is associated with increased morbidity and financial burden.
- These issues have become more evident as acceptance to long-term weaning facilities become more restrictive and limited.
- Historically, the ICU clinical team was responsible to wean all ventilator patients regardless of etiologies or ventilator duration.
- To address the above issues has become more evident as acceptance to long-term weaning facilities become more restrictive and limited.

Methods

- A multidisciplinary team was assembled to develop a strategic methodology to facilitate the weaning of patients who had failed traditional weaning or were deemed difficult to wean, defined as failure of > 3 spontaneous breathing trials.
- Clinical experiences and review of the literature were used to develop a systematic approach utilizing three weaning strategies based on the clinical status of the patient.

Systematic Approach

- Developed a three tier weaning approach:
  - Option A: a quicker more aggressive weaning plan,
  - Option B: a more conservative weaning approach and
  - Option C: a very conservative weaning process

- All options allowed weaning via conventional or high flow oxygen, and included hyper–inflation therapy every four hours.
- Ambulation was encouraged along with nursing, physical therapy and nutritional support.

Results

- 24 patients were placed on the prolonged weaning guidelines from July 1 - Dec 31, 2013.
- The mean ventilatory duration was 22.3 days and the mean age was 63.2.
- All patients were admitted to MSICU for respiratory failure. The most common etiologies were pneumonia and exacerbation of COPD.
- Eighteen (75%) were liberated from ventilator support, defined as assisted breathing absent of mechanical ventilation for greater than 48 hours.
- The average time until ventilator liberation for this group was 8.8 days.
- Four patients were transferred to an outside weaning facility and two were deemed not able to wean secondary to neuromuscular weakness.
- Historically, this category of patient population would have transferred to weaning centers, it was not possible to compare this process with past outcomes.
- Our inference is that this group of patients who were weaned via the guidelines would have had a longer ventilator duration without this intervention.

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Conclusion

- The prolonged weaning guidelines are a systematic method to wean patients at different levels of ventilator failure.
- By utilizing the guidelines, there is a target progression used to determine ventilator settings in addition to assessing the clinical status of the patient as a monitor of progression or failure.
- In our patient population it produced a 75% success rate in patients deemed difficult to wean.
- Currently all patients who failed conventional weaning are ordered on the Prolonged Weaning Guidelines.

Respiratory assessments should be performed daily and weaning conducted via one of the following strategies maintaining the patient’s pre-weaning FiO2 or 10% higher.

- PSV (Level ≥5<16cmH2O) via mechanical ventilation achieving an F/Vt between 40-90
- CPAP/flow-by mode via mechanical ventilation
- High flow oxygen via trach mask with every four hour hyperinflation therapy
- High flow oxygen via Optiflow with every four hour hyperinflation therapy
  - A Passy-Muir should be considered for any patient with a tracheostomy
- Hyperinflation therapy may include the following modalities:
  - Encouragement of deep breathing
  - Inter-percussive Therapy (IPT)
  - Incentive spirometry therapy
  - EPF/PEP Therapy
  - Sigh volumes via mechanical ventilation with volume targeted to 12-15 cc/kg/BW

- Monitoring of the patient during a weaning trial will include hemodynamic monitoring, and continuous ETCO2, and SpO2 measurements. Progressive weaning should be conducted via one of the following options depending on the patients overall strength.

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<tr>
<th>OPTION A</th>
<th>OPTION B</th>
<th>OPTION C</th>
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Wean option must be selected Options explained in order of priority