Use of the endOclear® Device (ECD)
TO IMPROVE VENTILATOR WEANING

PURPOSE

- Routine endotracheal tube suctioning techniques are unable to remove adherent secretions and biofilm from the endotracheal tube lumen, resulting in a narrowed airway, increased work of breathing, and colonization by ventilator associated pneumonia (VAP) organisms.
- Partial occlusion or narrowing of endotracheal tubes has been associated with increased patient work of breathing and delayed extubation. Caring for ventilated patients in an ICU is substantially more expensive than caring for non-ventilated patients. The endOclear® ET tube clearing device can be used to decrease airway resistance, expedite weaning by restoring the ET tube to optimal weaning conditions, and remove bacteria that cause VAP. The primary indications for use of the ECD include:
  - Thick Secretions
  - Difficulty suctioning/weaning
  - Acute change in patient condition
  - Hemoptysis
  - Prior to Bronchoscopy/tube exchange/tracheostomy
  - Increasing peak airway pressure and/or airway resistance

- The purpose of this study is to compare the effectiveness of removing adherent endotracheal tube secretions with the endOclear® device prior to weaning trials compared to the effectiveness of routine suctioning alone prior to weaning trials.

METHODS

- This is a three year retrospective study of all adult patients, age 18 or older, admitted to the Intensive Care Unit who were on the ventilator greater than 24 hours, and who met the general criteria for a sedation holiday and weaning trial. Total year 2011 ventilator days, ICU length of stay (LOS), hospital LOS, and ventilator associated pneumonia (VAP) were compared with year 2012 and 2013 patients who had their endotracheal tubes cleared with the endOclear® device prior to the weaning trial.

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RESULTS

- 583 cases were reviewed during year one, 516 cases in year two and 662 cases in year three. Prior to the initiation of the endotracheal tube being cleared with the endOclear® device, ventilator days were 4.3, ICU LOS was 5.2, and hospital LOS was 9.7. After the initiation of the endOclear® daily use protocol there was a decrease in average ventilator days by 1.1 days. ICU LOS decreased from 5.2 to 3.7, and hospital LOS decreased from 9.3 to 8.0. TheVAP rate went from 1.2 in 2011 to 0 in 2012 and continues to remain at 0. There was an estimated savings of $1,962,532 over the length of the study with the addition of the endOclear® device for cleaning the ET Tube prior to daily weaning trials.

Pre and Post endOclear Implementation
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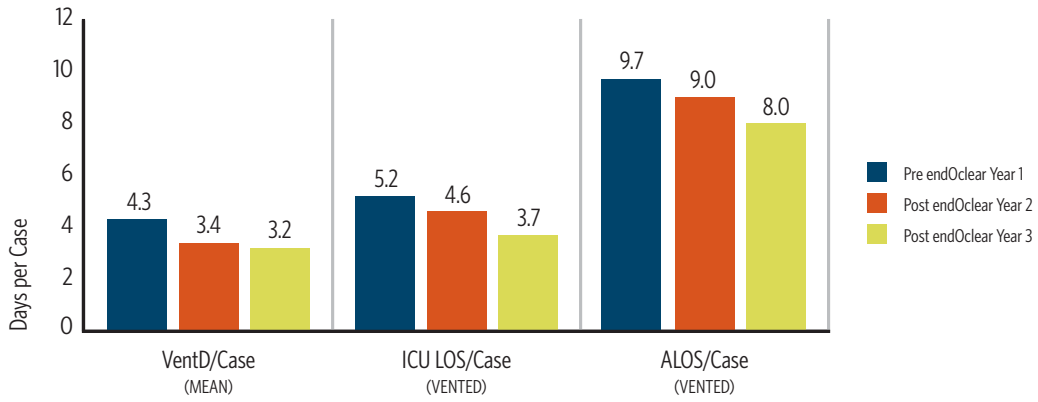

REFERENCES

- Maggiore, S.M., et al., *Prevention of endotracheal suctioning-induced alveolar de-recruitment in acute lung injury.* Am J Respir Crit Care Med, 2003. 167(9): p. 1215-24.
- Villafane, M.C., et al., *Gradual reduction of endotracheal tube diameter during mechanical ventilation via different humidification devices.* Anesthesiology, 1996. 85(6): p. 1341-9.
- Boque, M.C., et al., *Endotracheal tube intraluminal diameter narrowing after mechanical entilation: use of acoustic reflectometry.* Intensive Care Med, 2004. 30(12): p. 2204-9.
- Jaber, S., et al., *Long-term effects of different humidification systems on endotracheal tube patency: evaluation by the acoustic reflection method.* Anesthesiology, 2004. 100(4): p. 782-8.
- Shah, C. and M.H. Kollef, *Endotracheal tube intraluminal volume loss among mechanically ventilated patients.* Crit Care Med, 2004. 32(1): p. 120-5.

CONCLUSION

The removal of adherent endotracheal tube secretions with use of the endOclear® device prior to weaning trials provides both better patient care outcomes and cost savings to the hospital.

CLINICAL IMPLICATIONS

The endOclear® device more effectively removes adherent secretions and biofilm from the endotracheal tube lumen than current standard of care suctioning techniques. Cleaning the ETT should be considered as part of the daily ventilator care processes and be done prior to spontaneous breathing trials.

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