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### **Introduction:**

Endotracheal suctioning (ETS) is performed in patients on invasive mechanical ventilation to maintain airway patency and prevent infection, but is associated with side-effects and pain [1,2]. TrachFlush (AW Technologies) is a device automating an artificial cough (AC) method [3]. The AC is produced by rapid cuff deflation/inflation during inspiration. At respiratory rate (RR) of 7 1/min and Peak inspiratory pressure (PIP) of 30-40 cmH<sub>2</sub>O the original method was shown effective [3]. This study evaluated the feasibility of using bedside selected or similar PIP and RR for AC.

### **Methods:**

Patients were  $\geq 18$  years, orally intubated and ventilated in pressure control (PC) or pressure support (PS). In each patient, on clinical indication for ETS, 1-3 procedures each with 3 ACs were performed at PIP and RR as close to bedside settings as possible, allowing 1 sec inspiratory time (VENT<sub>low</sub>). If ETS remained indicated, three ACs were performed at increased PIP and decreased RR (VENT<sub>high</sub>).

### **Results:**

Preliminary results from 18 procedures in 8 patients. Mean $\pm$ SD age, SAPS 3 and tube size were 79 $\pm$ 6 years; 75 $\pm$ 24 and 7.4 $\pm$ 0.5, respectively. Proportions of male patients, active humidification and PC/PS ventilation were 50%, 63%, 28%/72%, respectively. Fifteen AC procedures were successful, 5 out of 18 VENT<sub>low</sub> (28%) and 10 out of 12 VENT<sub>high</sub> (83.3%), see settings in table. All failed procedures were in a single patient with RR 25-40 1/min.

Critical-Care Pain Observation Tool (CPOT) agitation, coughing, pain and discomfort showed good tolerance to AC with improvement following AC in several procedures and deterioration following a single procedure.

### **Conclusion:**

TrachFlush ACs successfully prevented ETS in 7/8 patients, using less excessive ventilator settings than originally proposed. Patients tolerated the ACs well.

### **References:**

[1]: AARC. Respir Care 55:758-64, 2010.

[2]: JP van de Leur. Crit Care 8:R467-73, 2004.

[3]: Zanella A et al. Respir Care 64:372-83, 2019.

### **Table:**

|          | PEEP, cmH <sub>2</sub> O | PC/PS, cmH <sub>2</sub> O | PIP, cmH <sub>2</sub> O | RR, 1/min      |
|----------|--------------------------|---------------------------|-------------------------|----------------|
| VENTlow  | 7.5 $\pm$ 2.1            | 12.7 $\pm$ 2.5            | 21.3 $\pm$ 3.3          | 21.6 $\pm$ 9.0 |
| VENThigh | 8.3 $\pm$ 1.6            | 17.1 $\pm$ 2.6            | 25.9 $\pm$ 2.8          | 19.8 $\pm$ 8.6 |

*Ventilator settings for VENTlow and VENThigh artificial coughs.*