

## POLICY AND PROCEDURE

<b>DEPARTMENT: Respiratory Care Services</b>	
<b>EFFECTIVE DATE: 8/12/2012</b>	<b>Author – William R. Howard, MBA, RRT</b>

### SUBJECT:

Application and Monitoring of Continuous Cuff Pressure for Artificial Airways

### REFERENCES:

1. Nseir S, Zerimech F, Fournier C, et al.: Continuous control of tracheal cuff pressure and microaspiration of gastric contents in critically ill patients. 2011; *Am J Respir Crit Care Med* , Vol 184:1041–1047.
2. Guidelines for the management of adults with hospital acquired, ventilator-associated, and healthcare-associated pneumonia. *Am J Respir Crit Care Med*. 2005;171:388-416.
3. Safdar N, Dezfulian C, Collard HR, Saint S. Clinical and economic consequences of ventilator-associated pneumonia: a systematic review. *Crit Care Med*. 2005;33:2184-2193.
4. Sole ML, Aragon D, Bennett M, Johnson RL. Continuous measurement of endotracheal tube cuff pressure: how difficult can it be? *AACN Adv Crit Care*. 2008;19:235-243.
5. Akca O. Endotracheal tube cuff leak: can optimum management of cuff pressure prevent pneumonia? *Crit Care Med*. 2007;35:1624-1626.
6. Seegobin R, Van Hasselt G. Endotracheal cuff pressure and tracheal mucosal blood flow: endoscopic study of effects of four large volume cuffs. 1984 *British Med Jour*, Vol 288.965-969.
7. Howard WR. Bench study of a new device to display and maintain stable artificial airway cuff pressure. 2011; *Respir Care*: 56(10).

### PURPOSE:

To accurately set, maintain, and monitor intra-cuff pressure in order to avoid ventilator associated pneumonia, (VAP), and to prevent tracheal damage when utilizing air-filled cuffed artificial airways.

### RESPONSIBILITIES:

The Medical Director of Respiratory Care Services is to ensure compliance with this policy.

The Executive Director of Patient Care Services is to ensure compliance with this policy.

The Director of Respiratory Care Services is to ensure compliance with this policy.

The Respiratory Care Services Supervisors and all staff are to ensure compliance of this policy.

### POLICY:

- 1) Cuff pressure (CP) will be monitored and maintained with all air-filled cuffed endotracheal and tracheal tubes.
  - 1.1 CP will be maintained between 25-27 cm H<sub>2</sub>O as protective measures against VAP and tracheal damage.

- 1.2 If the measured exhaled tidal volume is less than the prescribed tidal volume, this suggests a cuff leak or other patient circuit leak. If it is determined that the CP is insufficient when faced with ventilator high peak airway pressure, it may be reasonable to consider higher CP after circuit leak has been ruled out.
- 1.3 The measured cuff pressure value will be documented on the ventilator flowsheet with every patient assessment.
- 1.4 The ventilator flow sheet must list the type of tube, the size of the tube, tube depth measurement at the lip, date of intubation, and/or if it is cuffed or uncuffed.

#### **CUFF COMPLICATIONS:**

1. Insufficient cuff pressure (reported to be below 20-25 cm H<sub>2</sub>O) promotes secretion migration and the risk of contaminating the lower airways. Maintaining CP above these levels; (between 25-27 cm H<sub>2</sub>O) is reported to guard against this complication.
2. Sustained cuff pressure in excess of 30 cm H<sub>2</sub>O - for longer than 15 minutes in the normotensive patient - will result in tracheal damage. This might include ischemia of the mucosa, necrosis, hemorrhage and ultimately stenosis of the trachea.

#### **EQUIPMENT:**

CuffSentry™ continuous cuff pressure management system

#### **PROCEDURE:**

Instructions for cuff pressure management using CuffSentry™:

The CuffSentry™ continuous cuff pressure management system should only be used with air-filled cuffed artificial airways; e.g. cuffed tracheal and endotracheal tubes.

**NOTE:** The CuffSentry™ continuous cuff pressure management system is not to be used with saline-filled cuffs, or self-inflating cuffs.

- 1) Prior to intubation, perform the pre-check-out procedure and setup of the CuffSentry™ as described in the Instructions For Use package insert.
  - a. Assure that the desired cuff pressure is set on the CuffSentry™ before attaching to the pilot balloon.
- 2) After intubation:
  - 2.1 Inflate the artificial airway cuff with a syringe or by immediately connecting the patient line from CuffSentry™ to the pilot balloon.
  - 2.2 Connect the patient to the manual resuscitation bag or ventilator.
  - 2.3 Check and verify that the CP is set to your preferred level.
  - 2.4 Adjust CuffSentry™ pressure to be approximately 2-3 cm H<sub>2</sub>O above the ventilator's peak airway pressure (Pawp).
    - 2.4.1 Manage to maintain CuffSentry™ set pressure slightly above Pawp while staying below protective CP of 30 cm H<sub>2</sub>O.

2.5 Tuck in CuffSentry's patient-pressure line within the semi-circular holders - along the length of the patient-circuit.

- 3) Check the ventilator to be sure of an adequate return of ventilator volumes.
- 4) Set ventilator alarms per Department protocols.

**TRANSPORT:**

1. Disconnect the CuffSentry™ patient-pressure line when transporting the patient outside of the ICU.
2. Reconnect CuffSentry™ patient-pressure line when the patient returns to the ICU and verify that the CP is as at your desired setting.

**INFECTIOUS DISEASE:**

1. CuffSentry™ is for single-patient use.
2. Dispose in regular trash when patient is extubated.

**APPROVALS:**

\_\_\_\_\_  
Respiratory Care Services Medical Director

\_\_\_\_\_  
Date

\_\_\_\_\_  
Executive Director, Patient Care Services

\_\_\_\_\_  
Date

\_\_\_\_\_  
William R. Howard, MBA, RRT  
Director, Respiratory Care Services

\_\_\_\_\_  
Date