

Cuff inflation practices at the Prince of Wales Hospital

Interview with Bruce Dowd RN (ICU Cert), Nurse Manager at Prince of Wales Hospital Sydney, about the main benefits of using IntelliCuff®

The Prince of Wales Hospital has a 16-bed adult Intensive Care Unit (ICU) made up of 12 intensive care and 4 high dependency beds. The unit provides specialised care to patients with many different surgical, medical or respiratory (breathing) problems.

“Continuous monitoring of cuff pressure is an important observation in critically ill patients”

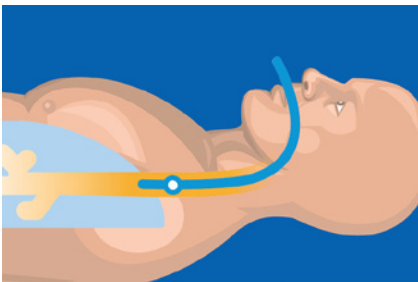
Q: How did you monitor intra-cuff pressures prior to using IntelliCuff?

Dowd: For over 20 years we have been continuously monitoring intra-cuff pressures of our artificial airways used on patients within our Adult Intensive Care Unit. Our initial monitoring consisted of attaching extension tubing from the airways pilot balloon to a gauge at the patient’s bedside. The intra-cuff pressure we maintain is 28 cmH₂O (20 mmHg). This worked well with our early “Bird Mark 7” modified ventilators, however with the advent of microprocessor ventilators we adapted this concept into a Cuff Manometer and a Cuff Inflator.

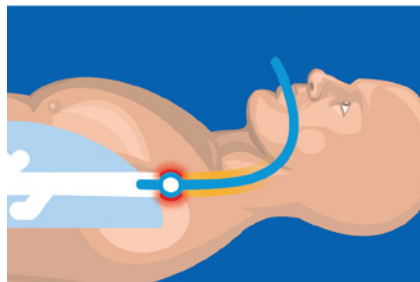
We sourced the inspiratory signal from our Infrasonics Adult Star ventilators, this allowed us to synchronise our cuff inflation with all ventilator breaths, SIMV and Pressure supported, this cuff inflation on inspiration helped reduce the problems with leaking cuffs allowing for optimum lung inflation on inspiration.



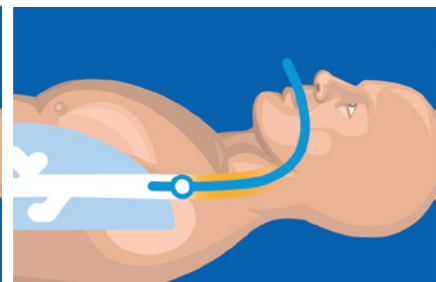
IntelliCuff screen on HAMILTON-G5



Underinflated cuff - too little cuff pressure



Overinflated cuff - too much cuff pressure



Optimal cuff pressure with IntelliCuff

This was all incorporated into a small box that lived on our ventilator trolley. This was checked and recalibrated yearly and it was not uncommon that this box became damaged upon transport of patients throughout the hospital. However the concept of the Nursing staff checking the cuff pressure hourly and writing this value down on the ICU flowsheet was commonplace and an important part of their ventilatory management.

We strongly believe that continuous monitoring of cuff pressure is an important observation in critically ill patients. The variation of these pressures was eloquently shown by Freebairn. The addition of having an automatic device maintaining these safe pressures has also been described by others*.

We have recently replaced our fleet of 20 Adult Star ventilators with HAMILTON-G5 ventilators. In discussions with Hamilton Medical the concept of incorporating this cuff manometer into the HAMILTON-G5 was persuaded. We have now been running this IntelliCuff system in 1 of our HAMILTON-G5 ventilators for over 1 year.

“The incorporation of the IntelliCuff into the ventilator has been a great advance in our unit”

Q: *What do you see as the main benefits of IntelliCuff?*

Dowd: IntelliCuff allows automatic maintenance of expiratory intra-cuff pressures as set by the clinicians; this can be an absolute value, e.g., 28 cmH₂O, or a range of pressures. The actual cuff pressure can be displayed on the ventilator and there are alerts if the pressure in the cuff falls or exceeds the set values.

There is also a DEFLATE CUFF feature that the nurses use when they are ready to extubate their patient. The incorporation of IntelliCuff into the ventilator has been a great advance in our unit. There is now not the issue of damaged boxes and also the calibration and checking is performed yearly when the HAMILTON-G5 has its yearly operation verification procedure. Also clinically there is automatic maintenance of intracuff pressures and the notification of alerts to the bedside nurse if there are cuff leaks or if the pressure in the cuff rises.

“Continuous monitoring of cuff pressure is important”

Q: *Why do you believe that continuous monitoring of cuff pressure is so important?*

Dowd: We believe that the continuous monitoring of cuff pressure is important for the following reasons:

1. Reduction in incidence of tracheal mucosal wall ischemia and vocal cord damage from high intracuff pressures.
2. Minimise aspiration of gastric contents into the lungs, helping with other measures in reducing Ventilator Associated Pneumonia (VAP).
3. Ensure maintenance of PEEP and alveolar ventilation.

For more information about IntelliCuff visit:

www.hamilton-medical.com/intellicuff



Bruce Dowd RN (ICU Cert), Equipment Nurse Manager, Prince of Wales Hospital, Adult Intensive Care Unit

*References

1. Freebairn R, : Endotracheal Cuff Pressures in Ventilated Patients in Intensive Care. Crit Care & Shock 2007; 10:142-147
2. Valencia M,; Automatic control of tracheal tube cuff pressure in ventilated patients in semirecumbent position:A randomized trial. Crit Care Med 2007; 35:1543-1549
3. Nseir S,; Continuous Control of Tracheal Cuff Pressure and Microaspiration of Gastric Contents in Critically Ill Patients.Am J Respir Crit Care Med 2011; 184: 1041-1047