

LUNG VOLUME LOSS DUE TO CLOSED SUCTION CATHETER CLEANING: A CRITICAL ISSUE IN SUCTION MANAGEMENT



Closed suction catheters (CSC) require flushing with normal saline after each suction.¹

- This cleaning process is essential to prevent the build-up of secretions within the catheter.¹



CONSEQUENCES OF INADEQUATE CLEANING POST SUCTIONING

- Dispersion of colonized bacteria from the catheter to the ventilator circuit and lower respiratory tract¹
- Increased chances of ventilator-associated pneumonia (VAP)¹



Prolonged periods of suctioning may be required for the adequate cleaning of the thick tenacious secretions from the catheter lumen.¹



RISKS ASSOCIATED WITH CLEANING OF CSC

Manual lung hyperinflation is a technique used to improve secretion removal and recruit areas of pulmonary collapse, leading to improved lung compliance and gas exchange.²

But evidence shows that cleaning of CSC (without a valve) during manual hyperinflation (MHI) results in:



Marked loss of lung volume¹



Interruption of ventilation¹

CSC cleaning contributes significantly to suctioning-induced lung de-recruitment.¹

- Repeated alveolar collapse and reopening is harmful for the lungs and must be avoided.¹



In mechanically ventilated patients, the use of a closed suction system with a valve between the patient's airway and catheter cleaning chamber prevents lung de-recruitment and maintains uninterrupted ventilation during catheter cleaning¹

Use of CSC with a valve must be encouraged in clinical practice to avoid the negative effects of de-recruitment.¹



DID YOU KNOW

BALLARD* 72 hour Turbo-Cleaning Closed Suction System reduces the costs associated with routine in-line suction catheter changes.^{3,4}

The costs incurred in changing closed suction catheter was assessed in a study published by the American Journal of Respiratory and Critical Care Medicine. Patients receiving in-line suction catheter changes every 24 hrs had 1,224 catheter changes costing a total of \$ 11,016, while patients receiving no routine in-line suction catheter changes had a total of 93 catheter changes costing \$ 837. This indicates that elimination of routine in-line suction catheter changes can reduce costs associated with mechanical ventilation.⁴



OUR SOLUTION



Avanos 72 hour Turbo-Cleaning Closed Suction System the proprietary and patented 'PEEP seal' technology that helps reduce PEEP loss and inadvertent lavage.



Turbulent Cleansing Chamber creates a cleansing action, resulting in an 89% cleaner catheter tip⁵



Manifold restrictor that closes under vacuum to allow the saline vial to empty into the catheter cleaning chamber without squeezing⁵

PEEP: Positive end-expiratory pressure

References: 1. Corley A, Sharpe N, Caruana LR, Spooner AJ, Fraser JF. Lung volume changes during cleaning of closed endotracheal suction catheters: a randomized crossover study using electrical impedance tomography. *Respir Care*. 2014; 59(4):497-503. 2. Pathmanathan N, Beumont N, Gratrix A. Respiratory physiotherapy in the critical care unit. *Continuing Education in Anaesthesia, Critical Care & Pain*. 2015; 15(1):20-5. 3. Avanos medical devices website. BALLARD* Turbo cleaning closed suction system [Internet]. [updated 2020; cited 2020 Jan 19]. Available from: <https://avanosmedicaldevices.com/respiratory-health/safety-and-prevention/ballard-turbo-cleaning-closed-suction-system/>. 4. Kollef MH, Prentice D, Shapiro SD, et al. Mechanical ventilation with or without daily changes of in-line suction catheters. *Am J Respir Crit Care Med*. 1997; 156(2):466-72. 5. Compared to Ballard* TrachCare* 24-hour closed suction systems. Ballard* Critical Care Products Trach Care* 72 Microbiology Report, Nelson Laboratories Final Reports, Laboratory Numbers 18343, 163901.1.