

PneuX™ in the Cardiac Intensive Care Unit (CICU)

Superior protection against ventilator associated pneumonia (VAP)¹ with significant cost savings vs. a standard endotracheal tube

Can you afford not to switch?



The cost of VAP in the CICU

Patients who undergo major heart surgery (MHS) are at high risk of developing VAP:

- VAP is the most frequent intensive care unit (ICU) acquired infection among patients receiving mechanical ventilation.²
- The incidence of VAP is higher in patients undergoing heart surgery than in medical or other surgical patient populations.³

45.9%

Almost half of all MHS patients requiring more than 48 hours of mechanical ventilation will experience VAP.⁴

1 in 5

One in five MHS patients intubated for shorter periods will develop early onset VAP with a standard endotracheal tube (ETT) (median 13.1 hours; 21% incidence of VAP).¹

25.5 days

MHS patients with VAP will remain in the ICU for longer (median 25.5 days vs. 3 days; $p < 0.001$) than those with no infection.⁴

1 6-fold increase

The mortality rate across all cardiac procedures in the UK is 3%.⁵ MHS patients with VAP are significantly more likely to die (45.7% vs. 2.8%; $p < 0.001$) vs. those with no infection.⁴

£22,000

The additional cost of VAP is estimated to be £6,000–£22,000 per episode.⁶

“Pulmonary complications are common after surgical procedures, accounting for nearly 1 of every 4 deaths that occur in the first postoperative week.”

Kollef M.H., 2014.

Fight VAP with PneuX™

- Subglottic secretion drainage (SSD) performed hourly is an effective VAP prevention strategy, reducing the incidence of VAP by up to 64%.⁸
- PneuX™ prevents the microaspiration that occurs with conventional cuffs⁹ and enables subglottic secretion management, thereby directly influencing two key steps in the pathogenesis of VAP.
- PneuX™ can almost halve the incidence of VAP among MHS patients vs. a standard endotracheal tube (10.8% vs. 21%, $p=0.031$).¹

“Aspiration of oropharyngeal pathogens or leakage of bacteria around the endotracheal tube cuff is the primary route of bacterial entry into the trachea.”

American Thoracic Society, 2005.

SUBGLOTTIC
DRAINAGE PORTS

SUBGLOTTIC DRAINAGE
AND IRRIGATION TUBE

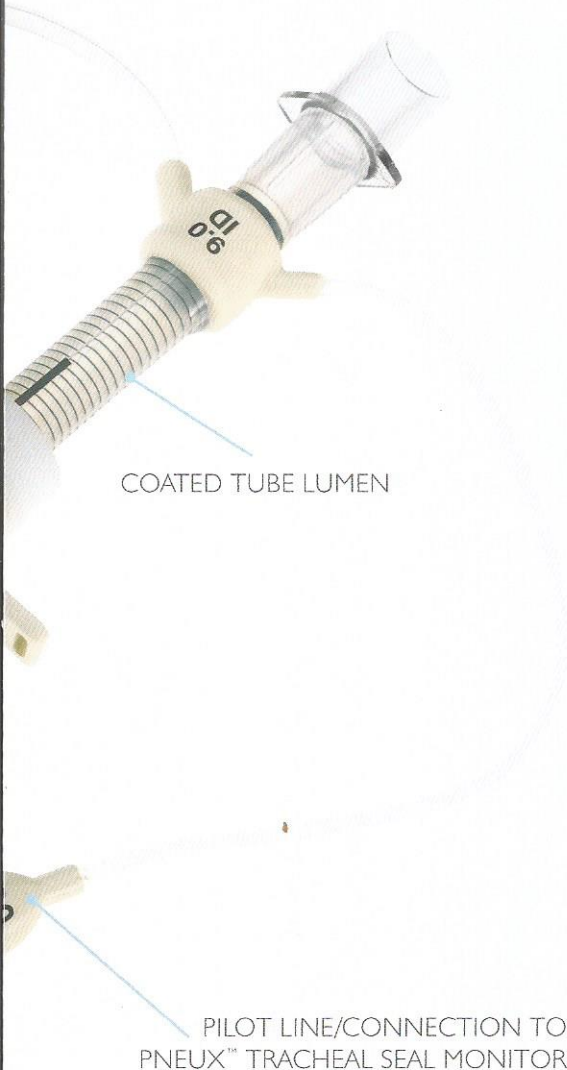
REPOSITIONABLE
SECURING FLANGE AND
INTEGRAL BITE BLOCK

LOW-VOLUME
LOW-PRESSURE CUFF

Tracheal seal monitoring for the prevention of aspiration

Designed exclusively for use with the PneuX™ ETT, the PneuX™ Tracheal Seal Monitor (TSM) measures, monitors and maintains a constant cuff pressure to protect against mucosal damage and prevent aspiration.²⁰





Three subglottic ports for intermittent SSD and irrigation

- Tubes with single subglottic drainage ports frequently fail (48% incidence)¹¹ and this failure is associated with an increased incidence of VAP.¹²
- PneuX™ ETT has three integral fine bore subglottic ports to provide maximum clearance of subglottic secretions independent of tube orientation.⁹

LVLP silicone cuff designed to prevent pulmonary aspiration

- In the 89% of critically ill patients who aspirate stomach contents¹³, pulmonary aspiration may be prevented with a low-volume, low-pressure (LVLP) tracheal tube cuff.¹⁴
- The PneuX™ ETT cuff has no folds and enables tracheal wall pressure to be maintained at 30cm H₂O; This helps to prevent aspiration and to reduce the risk of mucosal injury associated with high-pressure cuffs.^{7,15}

Soft, silicone 'boat tip' for atraumatic insertion

- The silicone tip of the PneuX™ ETT with its hemispherical bevel design exerts forces 7-10 times lower than a PVC ETT *in vitro*.¹⁶
- The tip is designed to facilitate atraumatic passage of the tube through the vocal cords.¹⁷

Kink-resistant, reinforced, silicone tube conforms to the airway

- By following the contours of the patient's airway, the silicone tube is designed to prevent injuries to the palate, the arytenoids and the trachea, which are often associated with more rigid tubes.¹⁸

Medical grade non-stick lining to inhibit adhesion of biological materials and biofilms

- Standard ETT's develop a biofilm load soon after placement; This is out of reach of the body's natural defences, is resistant to antibiotic therapy and acts as a constant source of reinfection.¹⁹



“PneuX™ reduces the risk of VAP in high risk patients undergoing cardiac surgery despite a short intubation time.”

Gopal S. et al., 2013.

A cost-effective VAP reduction strategy

Reducing the incidence of VAP with PneuX™ can deliver considerable cost savings to a CICU (Tables 1 and 2).

Table 1. Potential cost savings for 250 patients undergoing major heart surgery (cost of VAP at £22,000 per episode)

	PneuX™	Standard ETT
Cost per device (£) †	£150	£1
Number of MHS patients	250	250
VAP incidence (%) ††	10.8	21
VAP episodes per 250 patients	27	52.5
Cost of VAP (£22,000 per episode)	£594,000	£1,155,000
Total cost of devices (250 patients)	£37,500	£250
Total cost (devices + cost of VAP)	£631,500	£1,155,250
Total savings with PneuX™	£523,750	

† Data based on average end user prices of standard endotracheal tubes in the UK; †† Data based on VAP incidence rates as defined by Gopal S. et al. Critical Care Medicine 2013. Abstract 1086, doi: 10.1097/01.ccm.0000440322.68331.2b.

Table 2. Potential cost savings for 250 patients undergoing major heart surgery (cost of VAP at £6,000 per episode)

	PneuX™	Standard ETT
Cost per device (£) †	£150	£1
Number of MHS patients	250	250
VAP incidence (%) ††	10.8	21
VAP episodes per 250 patients	27	52.5
Cost of VAP (£6,000 per episode)	£162,000	£315,000
Total cost of devices (250 patients)	£37,500	£250
Total cost (devices + cost of VAP)	£199,500	£315,250
Total savings with PneuX™	£115,750	

† Data based on average end user prices of standard endotracheal tubes in the UK; †† Data based on VAP incidence rates as defined by Gopal S. et al. Critical Care Medicine 2013. Abstract 1086, doi: 10.1097/01.ccm.0000440322.68331.2b.

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