IS YOUR CUFF DOING THE JOB?

Polyurethane cuff and subglottic secretion drainage help prevent early- and late-onset VAP\(^1\)
LEADING AUTHORITIES: SUBGLOTTIC SUCTIONING IS A BEST PRACTICE

AMERICAN THORACIC SOCIETY INFECTIOUS DISEASES SOCIETY OF AMERICA

"Continuous aspiration of subglottic secretions can reduce the risk of early-onset VAP, and should be used, if available."*

THE SOCIETY FOR HEALTHCARE EPIDEMIOLOGY OF AMERICA

"[Providing ET] with subglottic secretion drainage ports for patients expected to require greater than 48 or 72 hours of mechanical ventilation. Considered "basic practice" for preventing ventilator-associated pneumonia in adult patients."*

AMERICAN ASSOCIATION OF CRITICAL-CARE NURSES

"Use an endotracheal tube (ET) with a dorsal lumen above the endotracheal cuff to allow drainage by continuous suctioning of tracheal secretions that accumulate in the subglottic area."*

CENTERS FOR DISEASE CONTROL (CDC)

"...use an endotracheal tube with a dorsal lumen above the endotracheal cuff to allow drainage (by continuous or frequent intermittent suctioning) of tracheal secretions that accumulate in the patient’s subglottic area."*

RECOMMENDATION OF THE COMMISSION FOR HOSPITAL HYGIENE AND INFECTION PREVENTION (KRINKO) AT THE ROBERT KOCH INSTITUTE

"The use of a subglottic suctioning endotracheal tube to prevent pneumonia in patients who require ventilation for more than 72 hours (Cat. IA). The risk of pneumonia from reintubating the patient should be weighed against the benefits of achieving a subglottic secretion drainage by replacing a regular endotracheal tube with an endotracheal tube with subglottic suctioning. To date, no evidence has yet been provided for the type of secretion drainage - intermittent or continuous - and the preventive benefit of tubes with polyurethane cuff / newly designed cuff geometry (Cat. III)."*

UK DEPARTMENT OF HEALTH

"The use of tracheal tubes with subglottic drainage ports can reduce VAP by preventing contaminated oral secretions that accumulate above the tracheal cuff intubated patients leaking past the cuff into the lungs."*

"A tracheal tube (endotracheal or tracheostomy) which has a subglottic secretion drainage port is used if the patient is expected to be intubated for >72 hrs."
THE HALYARD® MICROCUFF® TUBE FEATURES AN
ADVANCED MICROTHIN POLYURETHANE CUFF MATERIAL

• Provides an effective seal at low cuff pressure
• May reduce micro-aspiration of potentially infectious pharyngeal secretions - Potentially lowers risk of VAP in prolonged ventilation

Polyurethane can be made thinner and still maintain its strength
• Polyurethane (13 microns) cuff membranes used in the MICROCUFF® tubes are substantially thinner than conventional PVC cuffs (50-80 microns)
• Puncture strength of MICROCUFF® cuff is almost double compared to conventional PVC cuffs
• Burst pressure of MICROCUFF® tube is more than double compared to conventional PVC cuffs

Note the prominent channel formations in the PVC cuff.
CT scan (transversal) of an inflated HVLP-cuff in excised animal trachea (cuff-pressure: 20 cm H2O)

Note the absence of visible channel openings in the polyurethane cuff.
CT scan (transversal) of an inflated polyurethane tube in excised animal trachea (cuff-pressure: 20 cm H2O)

Compared to conventional PVC cuffs, a polyurethane cuff conforms better to the tracheal wall with more surface contact to prevent fluid leakage.
MICROCUFF® SUBGLOTTIC SUCTIONING ENDOTRACHEAL TUBES

Demonstrated difference:
An independent laboratory, Clinimark, conducted a study to measure the subglottic suctioning efficacy of PVC-cuffed endotracheal tubes compared to polyurethane-cuffed endotracheal tubes18.

**EFFICACY - Overall performance**

MICROCUFF® Subglottic Suctioning Endotracheal Tubes performed more effectively than other Subglottic Suctioning Endotracheal Tubes in both intermittent and continuous test conditions18.

**EFFICIENCY - percentage of secretions removed**

MICROCUFF® Endotracheal Tubes

A mean rate of 85% suctioning efficiency and less variability within the group in intermittent suctioning18. It was shown to have a 22% higher suction efficiency than certain competitor product in continuous suctioning.18

Only one FDA approved, saline rinse indication.

**VARIABILITY - Consistency in suction efficiency over time**

MICROCUFF® Endotracheal Tubes effectively prevent clogging of the suction lumen.

**Higher suction efficiency + More consistent performance = More effective**

**MICROCUFF® & MICROCUFF® Subglottic Suctioning Endotracheal Tubes**

<table>
<thead>
<tr>
<th>Tube material</th>
<th>PVC firm, does not kink when at body temperature</th>
<th>Soft</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEHP free</td>
<td>Yes</td>
<td>No or not mentioned</td>
</tr>
<tr>
<td>Murphy eye</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Shape of cuff</td>
<td>Cylindrical with maximum tracheal contact</td>
<td>Taper or pear shape</td>
</tr>
<tr>
<td>Cuff material</td>
<td>PU (ultra thin &lt;13 microns)</td>
<td>PVC or PU (&gt;15 microns)</td>
</tr>
<tr>
<td>Position of the cuff on the tube</td>
<td>Distal (to fit any trachea)</td>
<td>Higher/proximal</td>
</tr>
<tr>
<td>Cuff volume / cuff pressure</td>
<td>Larger volume to adapt to any size shape of trachea (typically need 12 cc syringe)</td>
<td>Lower</td>
</tr>
<tr>
<td>Suction valve + flush port</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Saline rinsing FDA approved</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Closed system when instilling air or saline</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sizes</td>
<td>7 to 9 mm MICROCUFF® Subglottic ET / 5 to 10 mm MICROCUFF® ET</td>
<td>6 to 10 mm</td>
</tr>
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</table>
VENTILATOR-ASSOCIATED PNEUMONIA

VAP IS A MAJOR CLINICAL CONCERN ASSOCIATED WITH HIGH INCIDENCE RATES, MORTALITY AND COSTS⁸

It’s worth taking measures to prevent even one case of VAP.

- Approximately 86% of hospital-associated pneumonia is linked with mechanical ventilation⁹
- VAP may account for up to 60% of all deaths due to Healthcare-Associated Infections (HAIs)⁸
- Approximately 8–28% of patients on ventilation develop VAP¹⁰
- Hospital-associated pneumonia patients have a mortality rate of 20% to 41%¹¹
- VAP increases patient time in the ICU by 4 to 6 days¹²
- Each incidence of VAP has been estimated to generate an increased mean cost of more than 37 000€ (more than £31 000)¹²

MICRO-ASPIRATION IS A MAJOR CAUSE OF VAP¹⁰

- Micro-aspiration of potentially infectious secretions through gaps in the endotracheal tube cuff is known to be a leading cause of VAP¹⁰
- The cuff seal is the final barrier that protects the lungs from aspiration of potentially infectious pharyngeal secretions¹³
### References