Self-Deployed Cuff and Skirt Tracheal Tube

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Technology description

The invention is a self-deployed endotracheal tube using a combined cuff and skirt approach that solves many of the problems associated with traditional endotracheal tubes. This invention replaces the inflation conduit with a hole connecting the inside of the tracheal tube to the inside of the cuff. It also includes a deployable skirt just proximal to and draped over the cuff. When positive pressure is applied to the tracheal tube during inspiration, the cuff is inflated, pressing it against the trachea and deploying the skirt.
In expiration, positive end expiratory pressure (PEEP) may deflate the cuff, but the skirt maintains the seal to the trachea. Special coatings applied to the cuff, skirt, and parts of the tube obviate possible problems with wetting and ensure a proper seal. The skirt itself has special struts that facilitate intubation and prevent inversion. Lastly, the location of the skirt and cuff, just below the subglottic space, take advantage of a higher pressure drop and present a better anatomical location. The higher pressure drop ensures better inflation of the balloon and skirt. The subglottic space is a natural narrowing of the trachea that provides an additional barrier that prevents inversion of the device.
Keywords:
Endotracheal tube, Cuff, Skirt, Self-inflating, Subglottic, Medical device, Strut, Hydrophobic, Lipophobic, Oleophobic

Application area

This technology can be applied for the following markets: endotracheal tubes, tracheostomy tubes, and for use in
operating rooms, emergency departments, ICU, or chronic ventilation.

Advantages

The invention solves many of the problems associated with traditional cuffed endotracheal tubes. The novel combination of the cuff and skirt creates a device that self deploys and remains deployed for the duration of mechanical ventilation bypassing any need for inflation, monitoring, or re-inflation. By utilizing normal ventilation pressures to deploy, the device eliminates the risk of tracheal injury from

excessive pressure. There is no risk of over-inflation. Lastly, the overall design and location of the cuff and skirt greatly decrease the risk of air leak. Additional benefits include a simplified manufacturing process that does not require inflation conduit.

- No conduit tubes or manual inflation
- No re-inflation or risk of over-inflation
- Reduced air leak
- Simplified manufacturing

Institution

Texas Tech University

Inventors

Bradley Fuhrman
Physician and Chair, Pediatrics
School of Medicine - El Paso

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com