Endotracheal Cleaning Suction Brush

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Technology description

Introduction

Patients in need of breathing support are generally treated with placement of a breathing tube. Physicians insert an endotracheal tube (ETT) through the mouth or nose into the windpipe in a process called endotracheal intubation. Patients in need of chronic ventilator support (i.e., ALS or post head trauma) often have a surgical procedure to create an opening in front of the neck providing access to the windpipe via a tracheal tube (TT). In both scenarios, lung secretions, blood, vapor, and bacterial seeding, which generates slimy microfilms, lead to build-up along the inner surface of the tube. Over short periods of time, such build-up becomes a bacterial breeding ground and hardens to a solid film. Build-up in the inner ETT/TT lumen increases the risk of ventilator associated pneumonia. Further, progressive luminal narrowing can also occur, leading to increased air flow resistance and effort required by the patient to breath, which has been shown to delay recovery and prolong dependence on a ventilator. Both bacterial seeding and luminal narrowing of ETTs/TTs are associated with increased length of hospital stay and health care costs.

Technology Description

Dr. Axel Rosengart of the Cedars-Sinai Medical Center has designed a device that combines tracheal suctioning and ETT cleaning into one convenient package. This combination cleaning catheter adds a suction-brush segment to the suction catheter which allows ETT/TT brush cleaning and aspiration of brushed off endoluminal debris each time the patient secretions are removed by conventional in-line suctioning.

Application area

Improved cleaning of ETTs and TTs

Advantages

The major disadvantages of existing products are that they (a) require disconnecting the ventilator (risks for atelectasis, hypoxemia, aspiration); (b) require the patient to undergo a specific, separate cleaning event; (c) the cleaning device needs in-servicing and is single-use; and (d) may cause ETT/TT dislodgement during cleaning.

In contrast, Dr. Rosengart’ s device:

• Allows ETT/TT cleaning to occur simultaneously with suctioning which transforms cleaning into an automatic, built-in provider function;

• Does not require ventilator disconnection which increases patient safety and lowers the risks of adverse events due to ventilator disconnection;

• Does not have risk for ETT/TT dislodgement during cleaning.

Institution

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