Optimization and customization of the tracheostomy balloon by shape morphing modeling

OFFICE DU TRANSFERT DE TECHNOLOGIE & DES PARTENARIATS INDUSTRIELS
LICENSING & TECHNOLOGY TRANSFER

Pathology: *Leakage of oral secretions out of the intubation tube is a risk factor increasing the development of mechanically ventilated acquired lung disease (MVALD), and excessive balloon pressure is a risk factor for tracheal injury. The solutions currently available to manage intubation tube balloon pressure require manual monitoring and adjustment of balloon pressure, adding to the workload of ICU teams.*

35%
Mortality rate under VMI

Medical care : *Even under optimal conditions of pressure control, perfect sealing of the balloon is rarely achieved. This may be due to wrinkling of the balloon surface, resulting in microchannels through which secretions can pass, or to the physiological mobility of the trachea, which expands and contracts around the balloon depending on the situation (swallowing, coughing, etc.).*

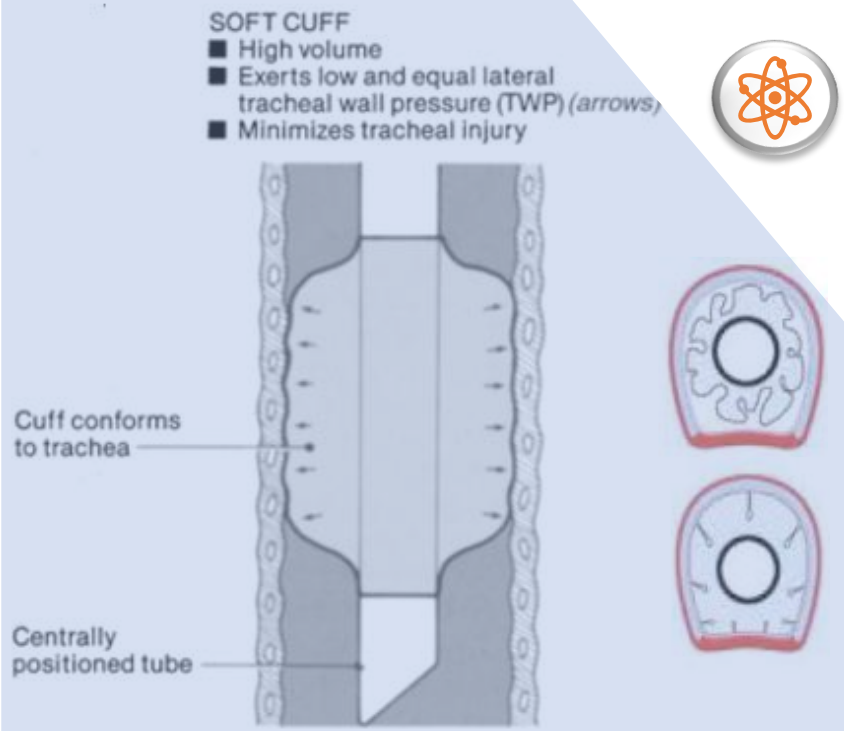
12 %
Hospital costs (2,8% of VMI patients)

Innovation: *The use of Shape Morphing (soft-robotics) enables complex shapes to be produced from air injected into silicone drilled or grooved with channels of mathematically calculated thickness and shape to obtain a calibrated and predictable deformation of the silicone object. The result is a cuff with a perfectly homogeneous surface pressure, and the possibility of surface peristalsis to expel bronchial secretions without tracheal suction.*

Intellectual property

Patent family FR2304872

(Priority: 16/05/2023)



Market : *Ventilator-associated pneumonia is the second most common nosocomial infection in pediatrics and neonatal intensive care. The DM market for endotracheal intubation is estimated at 3.2 billion USD (2028).*

Partnership : *We are looking for an industrial partner for Development of a functional prototype; Pressure testing on a bench; Modeling and development of the zero-sum-of-motion peristaltic pump prototype; Commercialization.*

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