Ask the Experts

Best Method for Securing an Endotracheal Tube

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What is the best practice for securing endotracheal tubes—taping, using twill ties, or using a commercial tube holder?

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According to the American Heart Association guidelines, postintubation management requires that endotracheal tubes be secured by using either tape or commercial devices.1 Evidence is currently limited and has yet to confirm a single best method for securing endotracheal tubes. Commercial and non-commercial methods are used to secure endotracheal tubes. Commercial methods are manufactured devices such as the Hollister Anchor-Fast and Thomas tube holders. Non-commercial methods consist of adhesive tape and non-adhesive twill product. The best method of securing the endotracheal tube would ensure maximum airway security with minimal risk of unwanted movement and/or unplanned extubation, ease of use, facial skin integrity, and infection control.

Airway Security

Unplanned extubation is a major complication occurring in 3% to 16% of patients receiving mechanical ventilation.2 According to Epstein et al, failed unplanned extubation increased the duration of mechanical ventilation, ICU stay, hospital stay, and need for long-term care.2 Preventing an unplanned extubation is the priority when securing an endotracheal tube.

In a study published in Respiratory Care, Shimizu et al3 concluded that the conventional adhesive tape methods had greater extubation force than the 2 endotracheal tube holders and that extubation force varies considerably depending on the width, length, and type of adhesive tape used. Mohammed and Hassan4 studied endotracheal tube slippage at various time intervals when twill versus adhesive tape was used to secure the tube. They reported that at 120 minutes after the tube was secured, 73% of patients in the twill group had no slippage but only 36% of patients in the adhesive groups had no slippage.

Tasota et al5 concluded that both internal and external movement of endotracheal tubes was significantly less with commercial endotracheal tube holders than when conventional non-commercial taping methods were used. As a result, nursing staff expressed a higher level of acceptance of commercial endotracheal tube holders as the method of choice for securing endotracheal tubes.

Ease of Use

Ease of use is best described as the ability to manage the endotracheal tube with greater effectiveness and efficiency. Repositioning an endotracheal tube that has been...
secured with adhesive tape is a time-consuming process that requires 2 clinicians at the bedside and a complete retaping once the endotracheal tube has been repositioned. Twill tape does not rely on adhesive material to secure the endotracheal tube. Instead, the tube is secured by using knots located around the endotracheal tube and the patient’s neck. In a study published in *Chest*, Levy and Griego\(^6\) reported that nurses and respiratory therapists ranked twill as easier to use than tape.

Commercial devices have been designed to allow quick repositioning of endotracheal tubes. Most devices have incorporated a track to which the endotracheal tube can be moved laterally. Studies have demonstrated that commercial devices tend to be more usable than noncommercial methods. Fisher et al\(^7\) reported that it took less time to move the endotracheal tube when commercially available devices were used than when noncommercial techniques were used.

### Facial Skin Integrity

Patients’ comfort and skin integrity are primary concerns when securing an endotracheal tube. According to Mohammed and Hassan\(^4\), at 12 hours after the tube was secured, no patients in the twill group had a severe facial skin reaction compared with 10% of patients in the adhesive tape group. Furthermore, 74% of patients in the twill group had healthy facial skin compared with 37% in the adhesive tape group.\(^4\)

Most commercial endotracheal tube holders offer skin-friendly adhesives that eliminate the need for adhesive tape. However, the force exerted on the patient’s face by many of the commercial securing devices may result in discomfort and formation of pressure ulcers, whereas noncommercial techniques are more form-fitting and do not have the same pressure point issues as seen with commercial devices.\(^7\)

### Infection Control

It is important that nurses and respiratory therapists provide oral care around the endotracheal tube. Booker et al\(^8\) identified barriers to effective oral care. Restricted access to the oral cavity because of the endotracheal tube and fear of dislodging the endotracheal tube, provoking aspiration, or causing discomfort were some of the factors contributing to ineffective oral care.\(^8\) Mohammed and Hassan\(^4\) reported that at 24 hours after the tube was secured, 80% of patients in the twill group had healthy oral mucosa compared with 37% of patients in the adhesive group.

Commercial endotracheal tube holders facilitate better routine oral care because of their ease of use. The ability to relocate the endotracheal tube allows nurses and respiratory therapists an unobstructed oral cavity for providing oral care without the fear of endotracheal tube dislodgment.

### Conclusion

Many devices and methods have been evaluated in search of finding the best method to secure an endotracheal tube, and each has its advantages and disadvantages. It is important that hospitals develop and maintain a collaborative multidisciplinary policy that allows all clinicians to be competent and effective when providing postintubation care.

References


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Crit Care Nurse 2016;36 78-79 10.4037/ccn2016214
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