

Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: The impact of endotracheal tube holders in the pre-hospital setting on tube placement upon arrival at the ED.

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Clinical Scenario:

EMS is called for a 30yo M who has fallen down a flight of 12 stairs. Upon arrival Pt is found at the bottom of his basement stairs with his neck in flexion occluding his airway. According to family Pt has been drinking and taking valium (unknown amount) for the past few hours. Pt stumbled out of the bathroom at the top of the basement stairs and fell, head first, down 12 stairs striking his head against the wall at the bottom.

O/E Pt has a GSC of 3, BP - 130/60, HR - 90, RR – 6. Pupils were dilated @ 8mm ERL but sluggish. Head was cyanotic. C-spine controlled and Pt was manoeuvred to open the airway. Ventilations were assisted with an OPA and BVM while IV access was established for sedation as Pt started to become agitated. 2.5mg of versed was administered and Pt was then successfully intubated on the first attempt. Tube secured with twill tape and confirmed by condensation, end tidal CO2 detector and auscultation. Pt was then fully immobilized.

Very difficult extrication from the basement. Proceeded Code 1 to ED. Upon arrival RT found that the tube was in the esophagus. Would the use of an endotracheal tube holding device prevent tube displacement during extrication?

PICO (Population – Intervention – Comparison – Outcome) Question:

In intubated patients (P) does the use of endotracheal tube holders (I) vs. twill tape (C) impact tube placement upon arrival at the ED (O)?

Search Strategy:

In PubMed: (prehospital OR out of hospital OR paramedic OR emergency medical services) AND (endotracheal intubation OR invasive airway management) AND (twill tape OR endotracheal tube holder)

Search Outcome:

This search yielded 4 hits. One paper was relevant to this PICO question.

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Relevant Papers:

Author, Date	Population: Sample characteristics	Design (LOE)	Outcomes	Results	Strengths/ Weaknesses
Murdoch, 2007	A single adult intubation manikin torso (Laerdal).	Prospective experimental simulation pilot study. LOE: III	Tube movement resulting from a fixed lateral force.	<ul style="list-style-type: none"> - 135 tube fixations with 12mm woven cotton cloth tape. Median movement = 22mm. - 135 tube fixations with the Thomas Endotracheal Tube Holder (Laerdal). Median movement = 4mm. - Failure to secure the tube in 61% (82/135) of fixations using the twill tape. 0% in the tubes secured by the Thomas Endotracheal Tube Holder. 	<p><u>Strengths</u> – Tube fixations done by paramedics.</p> <ul style="list-style-type: none"> - All used the same tying technique for fixation of the tube. - Full disclosure, no conflict of interest. <p><u>Weaknesses</u> – Force only in a right lateral direction.</p> <ul style="list-style-type: none"> - Pliable tissue of an adult human is likely to lead to a greater degree of tube movement than a rigid manikin. - Manikin model represents an ideal situation (no saliva, blood, etc.). - Also, no movement of the manikin for transfer or transport (extrication, EMS stretcher to hospital stretcher, etc.). - Unknown how many investigators independently (blinded) measured the tube displacement.

Comments:

Judging by the results of this study the Thomas Endotracheal Tube Holder (TETH) held the ETT more securely than the twill tape (median movement 4mm. vs. 22mm.). A 20mm. movement or greater was considered a failure to secure the tube. None of the tubes secured by the TETH experienced a failure while 61% (82/135) of the fixations using twill tape were considered failures.

Most of the subject matter on this topic is in regard to patients in intensive care units. Although paramedics are the ones fixating the tube in this case the study was done from a critical care transport perspective and on manikins. Studies need to be done with ground paramedics on emergency calls using real patients.

Clinical Bottom Line:

In intubated patients (P) the use of the Thomas Endotracheal Tube Holder (I) vs. twill tape (C) appears to decrease tube displacement in a manikin-based study (O).

References:

Murdoch E, Holdgate A. A comparison of tape-tying versus a tube-holding device for securing endotracheal tubes in adults. *Anaesthesia and Intensive Care*. October 2007.