

Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Prehospital Endotracheal Intubation in patients who have sustained a traumatic brain injury*

Report By: *Mark Grady*

2nd Party Appraiser: Jennifer Greene

Clinical Scenario: You are dispatched for an single occupant MVC. Arrive on scene and perform a quick assessment where you note that the patient has sustained a Traumatic Brain injury. You must now determine whether you are going to intubate this patient or manage with BLS skills.

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

P – prehospital ETI in patients with TBI

I – Endotracheal Intubation

C- without ETI

O – Higher mortality rate

Search Strategy:

(((Endotracheal Intubation or ETI))) AND ((EMS AND Emergen)) AND ((Traumatic Brain Injury or TBI))*

Search Outcome:

16



Paramedic - Evidence Based Medicine (P-EBP) Program

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Haltmeier, T. 2016	Investigate the effects of prehospital ETI in patients with TBI A total of 27,714 patients were analysed	Retrospective study LOE 2	Mortality rates on scene time transport times time in hospital	Prehospital ETI was associated with significant longer scene time (median 9 vs 8 min, $p < 0.001$) transport times (median 26 vs 19 min $p < 0.001$) lower ED GCS score (3.7 vs 3.9, $p = 0.026$) on vent (mean 7.3 vs 6.9, $p = 0.006$) longer ICU (median 6.0 vs 5.0 days, $p < 0.001$) total hospital stay (mean 10.0 vs 9.0 days, $p < 0.001$) in hospital mortality (31.4 vs 27.5%, $p < 0.001$)	-Large sample size took into account - several factors that are associated with paramedics - potential for a prospective study to determine if outcomes are a true representation of clinical outcome - selective bias in that clinical course may have predicted whether a patient's mortality could impact results
Bosser, S.M. 2015	Investigating whether prehospital ETI leads to an increased mortality review of 24 potential articles used for a systematic review of the 24 articles, it consisted of 30,000	systematic review Meta analysis Meta regression	Compared prehospital intubation vs no prehospital intubation and the potential increase of mortality. EMS provider skill/ experience level	no significant association observed PHI and mortality (OR 1.35, 95% CI 0.78 to 2.33, $p = 0.279$) limited ems provider experience higher mortality (OR 2.33, 95% CI 1.61 to 3.38, $p < 0.001$) Extended experience no evidence of increased mortality (OR 0.75, 95% CI	Limited to adults, no consideration for the pediatric population restricted/ reduced to 24 articles out of a potential 30,000 sensitivity analysis and bias confirmations were included to prevent



Paramedic - Evidence Based Medicine (P-EBP) Program

	patients, data only included 4772 patients			0.52 to 1.08, $p = 0.126$ meta regression confirmed EMS experience is a significant predictor of mortality ($p=0.009$)	obscuring of numbers Use of mortality as definitive study outcome results limited to one sole outcome potential outcome of survival rates would be beneficial in determining prehospital ETI
--	--	--	--	--	---

Comments: Had to do a PICO drift, limited amount of information or research on original PICO

Consider: There are still variables that need to be considered prior to removing the skill or indications for ETI with TBI. One has to consider the risk vs benefit of removing the skill. If the skill is removed and yet the patient does require ETI, than intubation will take place in the hospital when the patient does not have a definitive airway throughout transport.

Clinical Bottom Line: ETI is a high acuity skill that does need to be maintained at a high level. Continuous practice of the skill can reduce several factors that have been highlighted in these articles as negative consequences by EMS providers.



Paramedic - Evidence Based Medicine (P-EBP) Program

References:

Haltmeier. T., Benjamin. E., et al. (2016). *Prehospital Intubation for Isolated Severe Blunt Traumatic Brain Injury: Worse Outcomes and Higher Mortality*. European Journal of Trauma Emergency Surgery.

Bosser. S.M., Schwarte, L.A., et al. (2015). *Experience in Prehospital Endotracheal Intubation Significantly Influences Mortality of Patients with Severe Traumatic Brain Injury: A Systematic Review and Meta - Analysis*. PLoS ONE 10(10): e1410134. doi:10.1371/journal.pone.0141034

