

Mini-CAT (Critically Appraised Topic)
EMS Rotation

Title: Pre-hospital pediatric endotracheal intubation

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Clinical Scenario

A two month old infant has a witnessed cardiac / respiratory arrest at home. Bystander CPR is initiated by a family member. Paramedics arrive and continue CPR, and an endotracheal tube is placed for airway control during the resuscitative efforts.

PICO (Population – Intervention – Comparison – Outcome) Question

In pediatric patients with cardiac or respiratory arrest, is pre-hospital placement of an endotracheal tube superior to BVM or a supraglottic device for airway management?

Search Strategy

Pubmed search

Clinical queries narrow filter (prehospital endotracheal intubation)

- yielded 29 references

Limit set → birth to 18 years

This search yielded 7 papers. Two papers were relevant to the PICO question

Author/Date	Population	Design	Outcomes	Results	Strengths/Weaknesses
Chen 2008	Paramedic training program. EMS personnel undergoing initial training or recertification	Randomized trial comparing endotracheal tube intubation (ETT) to use of laryngeal mask (LMA)	Time from beginning of simulation scene to adequate ventilation	Mean time to effective ventilation was 46 seconds using ETT and 23 seconds when using LMA. Mean number of attempts was 1.27 using ETT and 1.1 using LMA	Reached study population from power calculation Randomized study Simulation using Sim baby mannequin Did not describe how paramedics were enrolled (? Selection bias) Limited generalizability with use of Sim baby. Sim baby is the size of an 18 month old child

Mitchell 2012	Convenience sample of paramedics and paramedic students. All participants had prior training with endotracheal tube intubation. Pediatric experience was not required	Prospective randomized trial comparing ETT to King LT (KLT) in pediatric respiratory arrest.	Time to successful placement of airway. Secondary outcome is the number of misplacements of each device.	No statistical difference in time to placement of ETT or KLT with median time 27 seconds for KLT and 31 seconds for ETT. Esophageal intubation occurred 8% for ETT and airway leak 12% of KLT	Sim baby at 6 months of age used as simulation. Simulation study with unclear translation to human scenarios. Small study with only 25 participants. May not be generalizable to older children.
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Comments

These two studies compare different extraglottic airway devices to endotracheal tube intubation in simulated pediatric cardiac / respiratory arrests. Both studies investigated pre-hospital simulation with paramedics or paramedic students directly comparing different airway devices. Pediatric cardiac / respiratory arrests are very uncommon, and therefore these studies utilized mannequins to simulation scenarios. Both studies indicate that extraglottic devices are similar or faster than ETT placement in order to establish ventilation. Paramedics preferred use of the KLT compared to ETT.

Clinical Bottom Line

In pediatric cardiac or respiratory arrest simulations, the use of extraglottic airway devices, either King LT or LMA, demonstrate similar or faster insertion times to adequate ventilation. Extraglottic devices are a viable option in the prehospital setting for pediatric patients requiring airway management.

References

Chen L and Hsiao AL. Randomized trial of endotracheal tube versus laryngeal mask airway in simulated prehospital pediatric arrest. *Pediatrics*. 2008;122:e294-e297.

Mitchell MS *et al*. Paramedic king laryngeal tube airway insertion versus endotracheal intubation in simulated pediatric respiratory arrest. *Prehosp Emerg Care*. 2012 Apr-Jun;16(2):284-8.