




Evidence Summary Recommendations for Pediatric Prehospital Protocols

Emergency Medical Services for Children State Partnership

Pediatrics

Texas Children's Hospital®

BCM
Baylor College of Medicine

Purpose

- To provide summaries of existing evidence to address clinically-relevant questions in the management of pediatric patients in the prehospital setting, so that EMS agencies can consider the evidence in creating their own protocols

Topic and Question Selection

- 4 topics chosen by the EMSC Advisory Committee, based on stakeholder feedback
  - Avoided topics for which evidence-based guidelines are known to be under development:
    - Seizures (NHTSA/EMSC)
    - Pain management (NHTSA/EMSC)
    - Respiratory distress (EMSC-Texas)
- Stakeholder input gathered on clinically-relevant questions
- Top 3-4 questions for each topic addressed

Evidence Summary Development

- Texas Children's Hospital Evidence-Based Outcome Center (TCH EBOC) searched medical literature
- TCH EBOC drafted summaries
- EMSC made revisions and recommendation statements → will be posted on website
- Evidence quality: rated by TCH EBOC
  - Strong, moderate, low, very low
- Recommendation strength: rated by EMSC
  - Strong, weak

Topic: Cervical Spine Immobilization

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Cervical Spine Immobilization Questions

- **Question 1:** For pediatric patients in the prehospital setting, what are the specific risk factors for cervical spine injury (CSI) that can be used to create a selective spinal immobilization protocol?

Cervical Spine Immobilization Recommendation

- **Recommendation:** When considering the development of a selective spinal immobilization protocol in pediatrics, patients with any of the following criteria <u>should</u> be immobilized:
  - GCS<15
  - Neck pain in children >2 years
  - Diving injury
  - Substantial torso (clavicle, abdomen, flank, back, or pelvis) injury
  - High-risk (head-on, rollover, ejection, death in vehicle, speed >55 mph) motor vehicle collision
  - Focal neurologic findings
  - Limited movement of the neck
  - Evidence of intoxication
  - Painful distracting injury
- **Evidence Quality:** Moderate
- **Strength of Recommendation:** Strong

Cervical Spine Immobilization Questions

- **Question 2:** For stable, alert, non-cooperative pediatric trauma patients in the prehospital setting, do the potential benefits of full spinal immobilization outweigh the potential harm of physiological and/or psychological injury secondary to forced immobilization?

Cervical Spine Immobilization Recommendation

- **Recommendation:** Due to the risk of severe secondary injury or death, alternative means to minimize spinal movement during transport or no immobilization at all should be considered in situations when cervical collar placement has the potential to result in more neck movement than no immobilization at all

- **Evidence Quality:** Very low

- **Strength of Recommendation:** Strong

Cervical Spine Immobilization Questions

- **Question 3:** For pediatric patients with suspected cervical spine injury in the prehospital setting, what are the most age-appropriate methods of inline spinal immobilization to minimize harm?

Cervical Spine Immobilization Recommendation

- **Recommendation:** Children younger than 8 years old should be transported with elevation of the back or an occipitally recessed backboard to optimize neutral positioning of the cervical spine.

- **Evidence Quality:** Low

- **Strength of Recommendation:** Weak

Cervical Spine Immobilization Questions

- **Question 4:** For pediatric trauma patients in the prehospital setting, can EMS providers accurately apply criteria for clearing cervical spines in the field?

Cervical Spine Immobilization Recommendation

- **Recommendation:** Implementation of pediatric selective spinal immobilization protocols that have prehospital providers apply previously established risk criteria for cervical spine injury should be considered

- **Evidence Quality:** Moderate

- **Strength of Recommendation:** Weak

Topic: Non-traumatic Shock

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Non-Traumatic Shock Questions

- **Question 1:** For the pediatric patient presenting with non-traumatic hypovolemic shock from dehydration in the prehospital setting, does rapid delivery of initial fluid bolus(es) improve quality of care (e.g., decreased intensive care unit [ICU] admission rate, decreased hospital LOS, improved mortality, decreased end-organ failure)?

Non-Traumatic Shock Recommendation

- **Recommendation:** Pediatric patients with non-traumatic hypovolemic shock from dehydration should receive rapid delivery of intravenous (or intraosseous) isotonic fluid in aliquots of 20 ml/kg

- **Evidence Quality:** Very low

- **Strength of Recommendation:** Strong

Non-Traumatic Shock Questions

- **Question 2:** For the pediatric patient presenting with non-traumatic septic shock in the prehospital setting, does rapid delivery of initial fluid bolus(es) improve quality of care?

Non-Traumatic Shock Recommendation

- **Recommendation:** Pediatric patients with presumed septic shock should receive rapid delivery of intravenous (or intraosseous) isotonic fluid in aliquots of 20 ml/kg.

- **Evidence Quality:** Very low

- **Strength of Recommendation:** Strong

Non-Traumatic Shock Questions

- **Question 3:** For the pediatric patient presenting with profound non-traumatic septic or hypovolemic shock in the prehospital setting, does a fluid bolus via intraosseous (IO) needle (when peripheral access has failed) result in improved quality of care relative to deferring intravenous (IV) placement at the receiving hospital?

Non-Traumatic Shock Recommendation

- **Recommendation:** Fluid boluses via the IO route are recommended if administration via the IV route cannot be initiated in a timely manner.

- **Evidence Quality:** Very low

- **Strength of Recommendation:** Strong

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Topic: Post-resuscitation Management

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Post-Resuscitation Management Questions

- **Question 1:** In the post resuscitation management of the pediatric patient in the prehospital setting who has not been previously intubated, how does intubation compare with bag valve mask ventilation in terms of improved outcomes (mortality upon arrival to the EC, 30 day mortality, neurologic outcome)?

Post-Resuscitation Management Recommendation

- **Recommendation:** In the post resuscitation management of the pediatric patient in the prehospital setting, bag valve mask ventilation is preferred over endotracheal intubation to enhance improved outcomes.

- **Evidence Quality:** Very low

- **Strength of Recommendation:** Weak

Post-Resuscitation Management Questions

- **Question 2:** Does therapeutic hypothermia compared to no intervention in the post resuscitation management of the infant (non-neonate) or child in the prehospital setting result in better outcomes?

Post-Resuscitation Management Recommendation

- **Recommendation:** Therapeutic hypothermia is not recommended in the post-resuscitation management of the infant (non-neonate) or child in the prehospital setting.

- **Evidence Quality:** Low

- **Strength of Recommendation:** Strong

Post-Resuscitation Management Questions

- **Question 3:** Does therapeutic hypothermia compared to no intervention in the post resuscitation of the neonate (<1 month) in the prehospital setting result in better outcomes?

Post-Resuscitation Management Recommendation

- **Recommendation:** Therapeutic hypothermia is recommended in the post-resuscitation management of the neonate in the prehospital setting.

- **Evidence Quality:** Moderate

- **Strength of Recommendation:** Strong

Post-Resuscitation Management Questions

- **Question 4:** Does pulse oximetry monitoring with titration of oxygen delivery improve outcomes in the post resuscitation management of the neonatal patient in the prehospital setting?

Post-Resuscitation Management Recommendation

- **Recommendation:** Use of pulse oximetry to titrate oxygen delivery to neonates for post-resuscitation management is not recommended for the term infant. For infants with estimated gestational ages of < 32 weeks born in the prehospital setting, pulse oximetry should be used to titrate oxygen delivery to gradually achieve an oxygen saturation of 90-99% over 10 minutes, if pulse oximetry is available

- **Evidence Quality:** Very low

- **Strength of Recommendation:** Strong

Topic:
Non-transport

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Non-Transport Questions

- **Question 1:** Does the use of online physician consultation in prehospital pediatric non-transport decision improve outcomes (decreased adverse events, decreased inappropriate transport)?

Non-Transport Recommendation

- **Recommendation:** Since online physician consultation has some benefit in decreasing inappropriate transports, and there is the potential risk of adverse events with non-transport, online physician consultation should be sought when making a non-transport decision.

- **Evidence Quality:** Very low

- **Strength of Recommendation:** Weak

Non-Transport Questions

- **Question 2:** Are pediatric patients who are non-transported based on decisions made by prehospital emergency medical services personnel in the field more likely to experience adverse events than those who are transported?

Non-Transport Recommendation

- **Recommendation:** Non-transport decisions should be initiated by the parent/guardian of pediatric patients, not prehospital providers, yet clinical judgment of providers should be considered when denying caregiver-initiated requests. When prehospital providers agree with the parent/guarding request for non-transport, a final decision should be verified by pre-established criteria of the EMS agency's medical director or with approval of online medical direction.

- **Evidence Quality:** Moderate

- **Strength of Recommendation:** Strong

Non-Transport Questions

- **Question 3:** For the pediatric patient in the prehospital setting, is there a significant correlation between parental refusal of EMS transport to the emergency department and subsequent diagnosis of abuse?

Non-Transport Recommendation

- **Recommendation:** Since it is unclear if child abuse is associated with caregiver requests for EMS non-transport, prehospital providers should not do any supplemental documentation or law enforcement reporting beyond their normal practice in these situations, unless they have specific suspicion for abuse

- **Evidence Quality:** Low

- **Strength of Recommendation:** Weak

Non-Transport Questions

- **Question 4:** Does the use of online physician consultation significantly reduce the medical and/or legal risks associated with non-transport decisions for pediatric patients in the prehospital setting?

Non-Transport Recommendation

- **Recommendation:** Though it is unclear if online physician consultation reduces medicolegal risk for pediatric patients who are non-transported, prehospital providers should document the initiator and approver of the non-transport decision in the medical record and should consider online consultation to minimize potential risk.

- **Evidence Quality:** Very low

- **Strength of Recommendation:** Weak