

NH EMS Medical Control Board

NH Fire Academy, Classroom 1&2

September 19th, 2013

Agenda

09:00 Meeting Begins

12:00 Lunch

Welcome

Introductions/Disclosures

Approval of July 2013 Minutes

1. Bureau and Division Updates – Chief Mercuri - 10
2. Coordinating Board Update – Hubble, 5
3. Trauma Medical Review Committee – Call - 5
4. Trauma Conference - Jaeger – 5
5. Protocols – Blanchard ,Suozy, 60
6. Critical Care Update – Blanchard, Prentiss, 5
7. Update on New England Regional Protocols - D'Aprix, 20
Adjustment of cycle timing.
Involvement in PEGASUS project
8. Narcotic Diversion - D'Aprix - 15
9. Provider Safety- D'Aprix - 15
10. Topics ad libitum

Next Meeting: July 18, 2013 – Fire Academy

NH MEDICAL CONTROL Board

NH Fire Academy
Concord, NH

MINUTES OF MEETING July 18, 2013

Members Present: Kenneth Call, MD; Tom D'Aprix, MD; Frank Hubbell, DO MD; David Hirsch, MD; Ray Kelly, DO; Patrick Lanzetta, MD; Jim Martin, MD; Douglas McVicar, MD; Jim Suozzi, MD; Thomas Trimarco, MD

Members Absent: Joseph Leahy, DO; Mathurin Malby, MD

Guests: Jeanne Erickson, Steve Erickson, Janet Houston, Eric Jaeger, Sue Prentiss, Matt Greenston, Paul Leischner, Fred Heinrich, Aaron McIntire, Jason Preston, Stacy Meier, Mark Hastings, Grant Turpin, Jeff Stewart, Harry Wallus, Mike Foss, Mary Ellen Gourdeau, Scott Schuler

Bureau Staff: Vicki Blanchard, ALS Coordinator; Richard Cloutier, Field Services; Kathy Doolan, Field Services Coordinator; Shawn Jackson, Education Coordinator; Perry Plummer, Director

Welcome:

The meeting was called to order at 09:00.

Introductions were made.

Approval of March 2013 Minutes:

Discussion: None

Decision: Martin moved to accept the minutes as corrected, Call 2nd. VOTE passed unanimously.

1. Bureau and Division Updates:

(See EMS Briefing from Chip Cooper at the end of these minutes)

Status of Bureau Chief and Director Positions:

Director Plummer explained the selection process for the Bureau Chief and Director's positions. The Bureau Chief is through the Division whereas the Director's position is chosen by the Commission and put to the Governor for appointment. The Division just completed an assessment on 3 Bureau Chief candidates and have chosen the top candidate. They have offered the position to that candidate and are awaiting to hear whether he accepts. The Director explained that the assessment was an all day process with an interview panel of 8, made up of various EMS boards, committees, and associations, including the MCB and Coordinating Board. The panel was broken up into 2 groups and the candidates went through 2 separate oral boards as well as perform for a customer service scenario and legislative scenario. In the end both panel groups had

similar scores for the top candidate and are very confident they have the best person for the job.

Discussion: Suozzi who was on the panel stated it was an impressive and rigorous process. Meier, also on the panel, stated that the panels each concluded independently a clear and definite top candidate.

Decision: None.

2. Membership:

D'Aprix informed the group that the following members have been reappointed to board:

Call, D'Aprix, Leahy, Malby, Martin, McVicar.

Fore was not re-nominated by regional EMS council

3. Coordinating Board Update – Hubbell:

No report as Hubbell was unable to attend the last Coordinating Board Meeting

Discussion: Blanchard stated she would send out a copy of their minutes for review.

Decisions: Minutes to be circulated to the board.

4. Trauma Systems:

(See EMS Briefing from Chip Cooper at the end of these minutes)

Discussion: None

Decision: None.

5. Trauma Medical Review Committee – Call:

Call reported that he attended his first committee meeting and is in the process of understanding the trauma system designation process. At the meeting, they reviewed SNHMC and Cottage Hospital, but have not finalized.

Discussion: None.

Decision: None.

6. Protocols – Blanchard/Suozzi:

- Hazardous Materials Protocol: Updated the Material Safety Data Sheets (MSDS) to Safety Data Sheets (SDS) to align with National verbiage.
- Mass Casualty Protocol: No change
- Radiation Protocol: No change
- Spinal Injuries:
Suozzi explained to the board that NH and CT are the first states to look at this. It is a change in concept from spinal immobilization to “Spinal Motion Restriction” and ruling someone IN

to the protocol rather than ruling someone OUT, as the current Spinal Assessment Procedure does. Additionally, he pointed out that the protocol is missing a box for interfacility transfer, which will be added back in. It is being presented today for feedback and the committee expects to have a final draft for the September meeting.

Jaeger added that the protocol committee has much enthusiasm over the protocol and recognize it will require a huge education component. Additionally, the committee's recommendation to the board is that once the protocol is accepted, to roll it out mid-protocol-cycle, so that it is a stand alone rollout and not part of the 2015 rollout.

Discussion: D'Aprix, referring to the penetrating injury bullet, which states, not to immobile patients with penetrating trauma such as gunshot wounds or stab wounds, questioned why it was under the section on patients requiring spinal motion restriction. The committee will rework that bullet into the PEARLS section.

Heinrich questioned the language that talks about minimizing movement, but then says to remove them from the board. He stated it was confusing to him, and asked if that meant they should evolve to only using a scoop? Jaeger reassured that they would rework that sentence to make it less confusing.

Leischner agreed that education was going to be key component to the success of this protocol, and not only with the providers but also the nurses and physicians. D'Aprix agreed, but added that he hears people talking about it now, and does not think it will be an uphill battle.

Martin expressed concern in educating the Boston Hospitals, as his providers already get flack when they bring trauma patients down who have been cleared before transport. Suozzi stated that with the addition of the interfacility transfer box, it will help support the providers when going to Boston.

Decision: Accept the Mass Casualty, MCI, and Radiation Protocols as presented and send the Spinal Injury back to committee to rework the penetrating trauma, add an interfacility box, and clarify the limiting movement bullet.

7. EMS-C – Houston/Jaeger:

Houston reported on the Hospital Pediatric Readiness Assessment, stating the process was winding down and NH was 88% complete, with just Cheshire and Speare left to complete. She added that NH is scoring as one of the highest states with percentage of participation, and is very happy.

Jaeger introduced the new EMS-C webpage: <http://www.nhpediatricems.org>. The site was projected and navigated shortly for the board and audience to get a flavor of its content. Jaeger also explained that they have started a Twitter account which can be accessed by clicker on the Twitter icon. Houston also handed out postcards with additional information on the site.

Discussion: All liked the site and complimented Houston and Jaeger. Jaeger stated they would welcome input and feedback.

Decision: None.

8. Critical Care Update – Blanchard/Prentiss:

Prentiss reported that since the May MCB meeting the CCT group has met twice. At the first meeting they discussed the ventilators and have a recommendation to send to the protocol committee. At the second meeting they discussed the critical care level in NH. The group has a sense that there is a problem, but we do not have the data to prove it one way or another. The plan is to do a survey to get data. If the data shows there is a need, do we expand PIFT, do we make it a licensure level? The committee then put together a straw man to outline what CCT might look like.

Hirsch, the MCB representative to the committee, added that the intent was not to replace DHART, but an alternative when they are not available, but what it will look like, we do not know yet.

Discussion: D'Aprix stated that hospitals do not want to send staff and we need to do what is best for NH, and feels PIFT is maxed out.

There was further discussion regarding staffing, partnerships and consortiums. It was agreed the next step was for the committee collect data to define the need.

Decision: Committee to move forward and develop a survey for data collection.

9. Update on New England Regional Protocols - Suozzi:

The New England Regional Protocols are adopting the NH formatting. Vermont will soon be releasing their protocols using our format and Massachusetts is also looking at our design.

Discussion: None

Decision: None

8. Community Paramedicine – Schuler

Schuler, a member of the Community Paramedicine subcommittee, reported that the subcommittee has been spending their time researching the traditional course curriculum versus a non-traditional, modular approach for the Community Paramedicine Prerequisite. The thought process, at least to get off the ground, is to form a multi-disciplinary group to review programs and begin to build some modules, such as for COPD or CHF readmission reduction. Then as the program grows and our modules grow, see how they fit into a traditional course.

Discussion: There was discussion surrounding the need to identify gaps in the communities and how to work with the other home health agencies to fill those gaps and not compete.

Decision: MCB supports the subcommittee to move forward and look at a multi-disciplinary group and modules.

Topics ad libitum:

None

Adjournment: 11:25

Next Meeting: September 19, 2013 – Fire Academy – Concord, NH

Respectfully Submitted,

Tom D'Aprix, MD, Chairman

Prepared by Vicki Blanchard, ALS Coordinator

DRAFT

EMS Briefing from Chip Cooper, Acting Bureau Chief

July 18, 2013

I apologize that I was unable to be at this meeting today. I am in Minnesota at the Image Trend User's conference. They are unveiling their vision and some software mockups for our transition to the NEMSIS version 3 dataset next year. I am also getting a chance to network with EMS leaders from other states, especially the New England states, and that always helps to strengthen our relationships.

Director and Bureau Chief: Jeff Phillips or Perry Plummer will be talking about both of these issues, if they haven't already.

EMS Bulletin

In progress, working on this long-distance with our pinch-hit editor means this may be done today some time. I apologize that I didn't have this printed for you, but we will email it out as soon as it is ready.

Trauma Programs:

The Trauma Coordinator position is open as most of you know. We won't begin looking at filling this position until after a BC is in place. After that, we need to evaluate whether the position description will be modified to include Stroke and STEMI to become a systems-of-care coordinator. There are statutes that define the oversight of the trauma system, but obviously not STEMI and Stroke. Additionally, there are not yet clearly defined national criteria for Stroke and STEMI designation-although we seem to be getting closer to having these criteria. These factors need to be considered in changing the position description, because there will be no statutory authority for any oversight for STEMI or Stroke.

The Statewide Trauma Registry is still in progress. We are trying to finish shoe-horning our 2 pages of requirements into the 80 plus pages of legalese required by DOIT and the state to be able to post the RFP. Once that has been done and one of the two possible vendors have been chosen, We will need to turn the RFP and more legalese into the contract, and then get that approved by multiple people in DOIT, then get it reviewed by the business office and AGs office (twice). After that it can go to Fiscal Committee to accept the grant funds before finally going to the Governor and Council to have the contract approved.

Trauma Designations: There is one active trauma designation review in process. The TRMC has created a designation sub-committee that is working on scheduling the site review. The trauma designation system will be reviewed again starting in January after ACS comes out with their updated designation system, which is expected to include criteria for level four facilities.

Trauma Conference: the date and location has been scheduled and some speakers have been contacted. We will be identifying a part-time person to coordinate the conference.

Sporting Events with large numbers of participants. Recently, we had an event in NH called Tough Mudder. This event had between 12,000-15,000 participants, plus spectators. The Tough Mudder group had a contracted safety and medical support agency from out-of-state whose primary mission seemed to be to make money. They had a medical support plan that looked good on paper, but was really just a straw-man. The agency also appears to work on the principal of asking for forgiveness, rather than permission when it came to coordinating

with states and local medical resources. Unfortunately, when we looked at the recently developed Preplanned Medical Standby Coverage plan, the criteria didn't really fit this type of event. The PPMSC plan was intended for small sporting events like baseball and football games, or fairs or camps. In these events, there could be a relatively large number of people in attendance, but there is a relatively small number of people doing something risky. However, in an event like Tough Mudder, or a triathlon, the opposite is true, where you tend to have a large number of people doing risky activities and a small number of people watching. These type of events require a different plan of response that includes a triage and tracking system, minor and major treatment capability and ability to expand for catastrophic events. This plan would require a defined medical director and relationship with a hospital. We will be working on this plan with the Coordinating board starting today.

Line of Duty Deaths: The police and fire in NH have defined statutes for a response plan to line-of-duty death. These plans augment the federal Public Safety Officer Benefits plan and are well developed. Due to a recent event, we have discovered that EMS has no such plan in place. We have begun working with the Fire Marshals office, medical examiners office and other agencies to create legislation language to bring forward for adoption. Governor Hassan's office has already been informed about this issue and the Governor has promised full support in working on this legislation.

DRAFT

4.X Spinal Trauma – DRAFT ONLY

The New Hampshire Medical Control Board has approved the following protocol. It supersedes Advanced Spinal Assessment Protocol 6.1. It represents a significant change in practice for EMS providers. It reflects our intention to ensure that EMS standards in New Hampshire remain consistent with the best emergency medicine standards. As with all protocol changes, services should promptly provide training for providers in the use of this protocol. Resources are available online at [URL].

EMT/ADVANCED EMT/PARAMEDIC STANDING ORDERS

PURPOSE: The intent of this protocol is to provide guidance on the care of patients who have a possible spinal injury.

Patients who have experienced a high risk mechanism of injury (see Red Flag Box) require spinal motion restriction (as described further on) and protection of the injury site itself if they exhibit:

- Unstable patient with abnormal peripheral perfusion signs.
- Altered mental status (e.g., dementia, preexisting brain injury, developmental delay, psychosis, etc.).
- Alcohol or drug intoxication.
- Unable to participate in assessment (e.g. distracted by significant injuries to self or others.)
- Insurmountable communication barriers (e.g., deafness, or hard of hearing, language, etc.).
- Midline spinal pain and or tenderness is elicited with palpation.
- Abnormal (i.e. not baseline) neurological function and motor strength in all extremities.
- Numbness or tingling (paresthesia)
- Sensation is not intact and symmetrical (or baseline for patient).
- Cervical flexion, extension and rotation elicits midline spinal pain.

Patients without any of the above findings should generally be transported without the use of a cervical collar or other means to restrict spinal motion. Utilize spinal motion restriction only for those patients at high risk for spinal injury as described above or with clear clinical indications of spinal injury (e.g. deformity of the spine).

Long backboards do not have a role for patients being transported between facilities. If the sending facility has the patient on a long backboard or is asking EMS to use a long backboard for transport, EMS providers should discuss not using a long backboard with the sending facility physician before transporting a patient.

PEARL:

- As with traumatic brain injury, secondary injury to the spine often arises from increased pressure (e.g. swelling, edema, hemorrhage) or from hypoperfusion or hypoxia (e.g. vascular injury). While the optimal treatment for secondary injury has not been established, providers should protect the injury site and be cognizant of the risk of secondary injury.
- In some circumstances, extrication of a patient using traditional spinal immobilization techniques may result in greater spinal movement or may dangerously delay extrication.
- Studies suggest protecting the injury site from pressure may be as important as reducing spinal movement.
- **Patients with penetrating trauma require spinal motion restriction only if neurologic deficit is present.**
- All patients who have suffered possible spinal trauma should be handled gently and spinal motion should be minimized.
- Even with neurologic deficits caused by transection of the spinal cord, additional movement will not worsen an already catastrophic injury. Emphasis should be on airway and breathing management, treatment of shock, and rapid transport to a Level 1 or 2 trauma center.

Policy Continues

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Spinal Trauma – DRAFT ONLY

Policy Continued

EMT/ADVANCED EMT/PARAMEDIC STANDING ORDERS

- Routine Patient Care
- Maintain manual in-line stabilization during assessment
- Minimize spinal movement during assessment and extrication
- Self-extrication by patient is allowable if patient is capable consistent with the goals of restricting gross movement of the spine and preventing increased pain and discomfort.
- A long backboard, scoop stretcher, vacuum mattress, or other appropriate full length extrication device may be used for extrication if needed. Do not use short board or KED device.
- Apply adequate padding to prevent tissue ischemia and increase comfort.

If patient requires spinal motion restriction:

- Apply a cervical collar (~~being careful not to exacerbate a distracting injury~~)
- For ambulatory patients, allow the patient to sit on the cot, and then lie flat. (The "standing take-down" is eliminated.)
- Once the patient is moved to the stretcher, remove any hard backboard device by using log roll or lift-and-slide technique.
- Patients should only be transported to the hospital on a rigid vacuum mattress or hard backboard if it is necessary for patient safety (e.g., combative patient), or other treatment priorities (e.g., to address suspected increases in intracranial pressure associated with traumatic brain injury. See also Traumatic Brain Injury 4.5), or removal would delay transport of an unstable patient.
- Lay the patient flat on the stretcher, secure firmly with all straps, and leave the cervical collar in place. Elevate the back of the stretcher only if necessary to support respiratory function, patient compliance or other significant treatment priority.
- For conscious patients that poorly tolerate a rigid cervical collar (e.g., due to anxiety, shortness of breath), the cervical collar may be replaced with a towel roll and/or padding to minimize spinal motion.
- Patients with nausea or vomiting may be placed in a lateral recumbent position maintaining the head in a neutral position using manual stabilization, padding, pillows, and/or the patient's arm. See also Nausea/Vomiting Protocol 2.9.

Spinal Motion Restriction for Pediatric Patients

Children should be transported in a child safety seat per [Pediatric Transportation Policy 8.11](#).

- Apply padding and cervical collar as tolerated to minimize the motion of the patient's spine
- In a motor vehicle crash infants and children may remain in their own child safety seat, provided it has a self-contained harness and a high back, is undamaged, and is designed to be secured to the stretcher with two belt paths.
- If the patient requires significant care (e.g. airway management) that cannot be adequately performed in a car seat, remove the patient and secure him/her directly to the stretcher.

RED FLAG: Mechanisms that indicate high risk patients include:

- Motor vehicle crash >60 mph, rollover, ejection (low-speed, rear-end can usually be excluded).
- Falls >3 feet/5 stairs (patient standing with feet 3' above floor)
- Axial load to head/neck (e.g., diving accident, heavy object falling onto head, contact sports).
- Significant injury or mechanism of injury above the clavicle.
- Injuries involving motorized recreational vehicles.
- Bicycle struck/collision.
- Caution should be exercised in older patients (e.g. 65 years or older) and in very young patients (e.g. less than one year of age), as spinal assessment may be less sensitive in discerning spinal fractures in these populations.



Procedure 4.X

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Adrenal Insufficiency

Adult & Pediatric 2015 DRAFT

EMT STANDING ORDERS – ADULT & PEDIATRIC

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- Routine Patient Care.
- Identify and treat the underlying condition.
- Consider paramedic intercept.

ADVANCED EMT STANDING ORDERS - ADULT & PEDIATRIC

A

- Assist the patient/caregiver in giving the patient his or her own medications, as prescribed.

PARAMEDIC STANDING ORDER – ADULT & PEDIATRIC

P

Stress Dose:

- Adult: History of adrenal insufficiency; administer hydrocortisone 100mg IV/IM.
- Pediatric: History of adrenal insufficiency; administer hydrocortisone 2mg/kg, to a maximum of 100mg IV/IM.

PARAMEDIC EXTENDED CARE ORDERS- ADULT & PEDIATRIC

X

- After the stress dose continue to administer hydrocortisone every 6 hours:
 - Adult: 100mg IV/IM every 6 hours.
 - Pediatric: 2mg/kg IV/IM every 6 hours to a maximum single dose of 100mg.
- In patients with the following signs and symptoms consider the need for repeat stress dosing:
 - Nausea, vomiting, weakness, dizzy, abdominal pain, muscle pain, dehydration, hypotension, tachycardia, fever, mental status changes.
- Additional Considerations:
 - Aggressive volume replacement therapy.
 - Vasopressors may be needed to treat refractory hypotension, see [Shock Protocol 2.18](#).
 - Treat for hypoglycemia, see [Diabetic Emergencies Protocol 2.5](#).
 - Normalize body temperature.

PEARLS:

Adrenal insufficiency results when the body does not produce the essential life-sustaining hormones cortisol and aldosterone, which are vital to maintaining blood pressure, cardiac contractility, water, and salt balance.

Chronic adrenal insufficiency can be caused by a number of conditions:

- Congenital or acquired disorders of the adrenal gland.
- Congenital or acquired disorders of the pituitary gland.
- Long-term use of steroids (COPD, asthma, rheumatoid arthritis, and transplant patients).

Acute adrenal insufficiency can result in refractory shock or death in patients on a maintenance dose of hydrocortisone (SoluCortef)/prednisone who experience illness or trauma and are not given a stress dose and, as necessary, supplemental doses of hydrocortisone.

PEARLS:

A "stress dose" of hydrocortisone should be given to patients with known chronic adrenal insufficiency who have the following illnesses/injuries:

- Shock (any cause).
- Fever >100.4°F and ill-appearing.
- Multi-system trauma.
- Drowning.
- Environmental hyperthermia or hypothermia.
- Multiple long-bone fractures.
- Vomiting/diarrhea accompanied by dehydration.
- Respiratory distress.
- 2nd or 3rd degree burns >5% BSA
- RSI (Etomidate may precipitate adrenal crisis).

Allergic Reaction/Anaphylaxis Adult 2015 DRAFT

2.1A

EMT STANDING ORDERS

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- Routine Patient Care.
- For anaphylaxis, administer adult epinephrine autoinjector (EpiPen) 0.3mg IM in the lateral thigh.
 - For additional dosing, contact **Medical Control**.
- Do not delay transport.

Match the final language as Asthma for Albuterol/DuoNeb

ADVANCED EMT STANDING ORDERS

A

- For anaphylaxis administer adult epinephrine autoinjector (EpiPen) 0.3mg IM.
- Epinephrine (**1:1,000**) 0.3mg (0.3ml) IM. May repeat epinephrine 0.3mg IM, every 5 minutes (3 doses total).
- Consider the administration of albuterol 2.5mg via nebulizer. Repeat albuterol 2.5mg, every 5 minutes (4 doses total) via nebulizer.
- **Diphenhydramine 25 – 50mg PO/IM/IV.**

PARAMEDIC STANDING ORDERS

P

- Continue epinephrine (**1:1,000**) 0.3mg (0.3ml) IM every 5 minutes until signs/symptoms resolve.
- For severe anaphylaxis refractory to IM epinephrine, consider epinephrine (**1:10,000**) 0.1mg (1mL) (diluted in 10mL 0.9% normal saline) slow IV administration, repeated every 5 minutes until symptoms resolve.
- **Diphenhydramine 25 – 50mg PO/IM/IV.**

EMT/ADVANCED EMT EXTENDED CARE ORDERS

X

- Diphenhydramine 25 – 50mg by mouth. May repeat every 4-6 hours as needed; maximum dose of 300mg/24 hours.

PARAMEDIC EXTENDED CARE ORDERS

- **Methylprednisolone 62.5mg IV OR**
- **Prednisone 60mg PO**



CAUTION: Epinephrine is available in different routes and concentrations. Providers are advised to re-check the dosing and concentration prior to administration.



In anaphylaxis, epinephrine should not be delayed by taking the time to administer second-line medications such as diphenhydramine.

PEARLS:

Allergic reactions are commonly a single system response to an allergen involving the skin. Anaphylaxis is a multi-system response to an allergen including one or more of the following signs and symptoms:

- Severe respiratory distress.
- Airway compromise/impending airway compromise (wheezing, swelling of the lips/tongue, throat tightness).
- Widespread hives, itching, swelling
- Severe abdominal pain, vomiting and/or diarrhea, see [Nausea/Vomiting 2.X](#)
- Signs of shock, **consider fluid per** [Shock Protocol 2.18A](#).

2.1P Allergic Reaction/Anaphylaxis Pediatric 2015 DRAFT

EMT/ADVANCED EMT STANDING ORDERS

E/A

- Routine Patient Care.
- For anaphylaxis, administer pediatric epinephrine autoinjector (EpiPen Jr) 0.15mg IM in the lateral thigh for patients between 10kg and 35kg.
- For additional dosing, contact **Medical Control**.
- Do not delay transport.



Albuterol/DuoNeb
same as final
Asthma & move up
to AEMT

PARAMEDIC STANDING ORDERS

P

- For anaphylaxis: pediatric epinephrine autoinjector **OR**
- epinephrine (**1:1,000**) 0.01mg/kg (0.01ml/kg) IM, lateral thigh preferred. (Maximum single dose 0.3mg.). Repeat epinephrine 0.01mg/kg IM every 5 minutes until signs and symptoms resolve.
- Consider administration of albuterol 2.5mg via nebulizer. Repeat albuterol 2.5mg, every 5 minutes (4 doses total) via nebulizer.
- For mild symptoms in children >1 year of age, consider diphenhydramine 1.25mg/kg PO.
- For moderate to severe symptoms, diphenhydramine 1mg/kg IV/IM (maximum dose 50mg).
- For anaphylaxis refractory to IM epinephrine, consider epinephrine (**1:10,000**) 0.01mg/kg (0.1ml/kg) (diluted in 10mL 0.9% NaCl) slow IV push over. Repeated every 2 minutes until symptoms resolve. (Maximum single dose 0.1mg.)

EMT/ADVANCED EMT EXTENDED CARE ORDERS

X

- Diphenhydramine:
 - Ages 6 to 11 years: 12.5 – 25mg by mouth. May repeat every 4-6 hours as needed; maximum dose of 150mg/24 hours.
 - Ages 2 to 5 years: 6.25mg by mouth. May repeat every 4-6 hours as needed; maximum dose of 37.5mg/24 hours.

PARAMEDIC EXTENDED CARE ORDERS

- Methylprednisolone 1mg/kg IV (maximum dose 62.5mg)



CAUTION: Epinephrine is available in different routes and concentrations. Providers are advised to re-check the dosing and concentration prior to administration.



In anaphylaxis, epinephrine should not be delayed by taking the time to administer second-line medications such as diphenhydramine.

PEARLS:

Allergic reactions are commonly a single system response to an allergen involving the skin. Anaphylaxis is a multi-system response to an allergen including one or more of the following signs and symptoms:

- Severe respiratory distress.
- Airway compromise/impending airway compromise (wheezing, swelling of the lips/tongue, throat tightness).
- Widespread hives, itching, swelling
- Severe abdominal pain, vomiting and/or diarrhea, see [Nausea/Vomiting Protocol 2.X](#).
- Signs of shock, **consider fluid per** see [Shock Protocol 2.18P](#).

Apparent Life-Threatening Event (ALTE) 2015 DRAFT

2.2

EMT/ADVANCED/PARAMEDIC STANDING ORDERS

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- Obtain a history of present illness.
 - Who observed the event?
 - Determine the severity, nature, and duration of the episode.
 - Was the patient awake or sleeping at the time of the episode?
 - Include details of the resuscitation, if applicable.
- Obtain a past history of **prior similar event**, chronic disease (including seizures), current or recent infection, gastroesophageal reflux, recent trauma, medications, new or different mixture of formula.
 - Was child born pre-term or near-term?
- Perform a comprehensive physical exam including neurological assessment.
- Keep the child warm and transport to hospital.
- **Contact Medical Control for assistance if the parent/guardian refuses medical care and/or transport.**

PEARLS:

An ALTE involves a frightening episode in a child less than 2 years old and involves some combination of apnea, color change **to cyanosis**, limpness, or choking.

Non-accidental trauma should always be considered in an infant who presents with ALTE.

Note: Although children who experience ALTE may have a normal physical exam upon assessment by prehospital personnel, they should be transported to the emergency department for further assessment and treatment as they often have a serious underlying condition. Assume history provided by the family/witness is accurate.

EMT/ADVANCED STANDING ORDERS- ADULT & PEDIATRIC

- Routine Patient Care.
 - Approach patient using the SAFER Model.
 - Observe and record the patient's behavior.
 - Consider associated domestic violence or child abuse, see [Response to Domestic Violence Policy 8.14](#).
 - Determine if patient is under the care of mental health professionals and record contact information.
 - Assess for risk to self and others. Ask patient directly if he is thinking about hurting self or others.
- E/A** A patient who is a danger to self or others may not refuse care. If patient refuses care and requires medical care or is danger to self or others, contact police. (Refer to [Police Custody Policy 8.12](#) and/or [Refusal of Care Policy 8.13](#))
- If the patient does not appear to be an immediate threat to self or others and refuses transport:
 - Encourage patient to seek mental health evaluation.
 - Provide the mental health center emergency services number 1-800-273-TALK (8255).
 - Avoid leaving the patient alone, if possible. Assist in contacting responsible family/friend.

For patient with suspected Excited/Agitated Delirium:

- Treat hyperthermia, see [Hyperthermia Protocol 2.7](#).
- Monitor cardiac activity and oxygen levels.

PARAMEDIC STAND ORDERS - ADULT

P

- Paramedic Standing Orders continued next page.

SAFER Model

- S** Stabilize the situation by lowering stimuli, including voice.
- A** Assess and acknowledge crisis by validating patient's feelings and not minimizing them.
- F** Facilitate identification and activation of resources (clergy, family, friends, or police).
- E** Encourage patient to use resources and take actions in his/her best interest.
- R** Recovery/referral - leave patient in the care of a responsible person, professional or transport to appropriate medical facility. Do not leave the patient alone when EMS clears the scene.

Protocol Continues 

Behavioral Emergencies

Adult & Pediatric 2015 DRAFT

2.4

Protocol Continued

PARAMEDIC STANDING ORDERS - ADULT

P

Consider:

- Midazolam 2.5mg IV/IN may repeat once in 5 minutes; or 5mg IM, may repeat once in 10 minutes, **OR**
- Lorazepam 1mg IV, may repeat once in 5 minutes; or 2mg IM, may repeat once in 10 minutes, **OR**
- Diazepam 2mg IV may repeat once in 5 minutes; or 5mg IM, may repeat once in 10 minutes, **OR**
- Haloperidol 5 - 10mg IM; may repeat once in 5 minutes (max total dose 10 mg).

For patient with suspected Excited/Agitated Delirium:

- Midazolam 5mg IV/IM/IN; may repeat once in 10 minutes.
 - If agitation continues after the second dose of midazolam, then consider:
- Haloperidol 10mg IM; may repeat once in 10 minutes.



NOTE: Contact **Medical Control** if more than 10 mg of midazolam or 20 mg of haloperidol is needed.

- If cardiac arrest occurs, consider fluid bolus and sodium bicarbonate early, see [Cardiac Arrest 3.2A](#).

For acute dystonic reaction to haloperidol:

- Diphenhydramine 25 – 50mg IV/IM.



- **Excited/Agitated Delirium is characterized by extreme restlessness, irritability, and/or high fever. Patients exhibiting these signs are at high risk for sudden death.**
- **Medications should be administered cautiously in frail or debilitated patients; lower doses should be considered.**

PEARLS:

Consider all possible medical / trauma causes for behavior and treat appropriately:

- Hypoglycemia
- Head Injury, stroke, seizure post-ictal
- Poisoning, substance abuse, drug, alcohol

EMT/ADVANCED EMT/PARAMEDIC STANDING ORDERS

E/
A/
P

- Routine Patient Care.
- Obtain temperature.
- Passive cooling; remove excessive clothing/bundling.
- For temperature >101.5°F (38.5°C)
 - If no acetaminophen has been taken in last 4 hours:
 - Consider administering acetaminophen 500 – 1,000mg oral or rectal.
 - If acetaminophen has been taken within last 4 hours and temperature is still >101.5°F (38.5°C):
 - Consider administering ibuprofen 400 – 800mg oral or rectal.
 - If ibuprofen has been taken within the last 6 hours:
 - Consider acetaminophen 500 – 1,000mg oral or rectal.

EMT/ADVANCED EMT/PARAMEDIC STANDING ORDERS

X

- May repeat acetaminophen dose 650 mg oral or rectal every 4 hours or 1,000 mg every 6 hr. Maximum of 3,000 mg/24 hours.
- May repeat ibuprofen dose 400-600 mg oral or rectal every 6 hours or 800 mg every 8 hours. Maximum of 2,400 mg/24 hours.



- Use **ibuprofen** with caution in patients with dehydration, cardiovascular disease, or preexisting renal disease.

History

The following symptoms, when associated with a fever, suggest a more serious illness:

- | | |
|--|---|
| • Persistent vomiting | • Severe headache |
| • Difficulty breathing | • Unusual sensitivity to bright light |
| • Chest pain | • Severe swelling of the throat |
| • Extreme listlessness or irritability | • Stiff neck and pain when the head is bent forward |
| • Abdominal pain | • Unusual skin rash |
| • Pain when urinating | • Confusion |
- For patients **who refuse transport**, urge caregivers to observe for signs of serious illness, encourage appropriate fluid intake, and safely store antipyretics.

PEARLS:

- Avoid inducing shivering.
- The primary goal of treating fever is increasing comfort rather than normalization of body temperature. Fever is a physiologic mechanism that helps fight infection. There is no evidence that fever worsens illness or causes long-term neurologic complications.
- **Infrared temporal thermometers are more accurate than tympanic thermometers.**

Fever (>101.5°F/38.5°C) Pediatric 2015 DRAFT

2.6P

Medical Protocol 2.6P

EMT/ADVANCED-EMT/PARAMEDIC STANDING ORDERS

E/
A/
P

- Routine Patient Care.
- Obtain temperature—rectal temperature preferred **in infants < 3 months**.
- Passive cooling; remove excessive clothing/bundling.
- For temperatures >101.5°F (38.5°C):
 - If acetaminophen was last taken more than 4 hours ago:
 - Consider administering acetaminophen per [Pediatric Color Coded Appendix A2](#) oral (Rectal administration is Paramedic only)
 - Acetaminophen has been taken within the last 4 hours:
 - Consider ibuprofen per [Pediatric Color Coded Appendix A2](#) oral (contraindicated in infants under 6 months of age).

EMT/ADVANCED-EMT/PARAMEDIC EXTENDED CARE ORDERS

X

- May repeat acetaminophen dose every 4 hours (not to exceed 6 doses in 24 hours)
- May repeat ibuprofen dose every 6 hours (not to exceed 4 doses in 24 hours)



- Use **ibuprofen** with caution in patients with dehydration, cardiovascular disease, or preexisting renal disease.

History:

The following symptoms, when associated with a fever, suggest a more serious illness:

- Persistent vomiting
 - Difficulty breathing
 - Chest pain
 - Extreme listlessness or irritability
 - Abdominal pain
 - Pain when urinating
 - Severe headache
 - Unusual sensitivity to bright light
 - Severe swelling of the throat
 - Stiff neck and pain when the head is bent forward
 - Unusual skin rash
 - Confusion
- For patients **who refuse transport**, urge caregivers to observe for signs of serious illness, encourage appropriate fluid intake, and safely store antipyretics.

PEARLS:

- Avoid inducing shivering.
- The primary goal of treating fever is increased comfort rather than normalization of body temperature. Fever is a physiologic mechanism that helps fight infection. There is no evidence that fever worsens illness or causes long-term neurologic complications.
- Children should never take aspirin.
- **Infrared temporal thermometers are more accurate than tympanic thermometers.**

2.7 Hyperthermia – Adult & Pediatric

2015 DRAFT

EMT STANDING ORDERS- ADULT & PEDIATRIC

E

- Routine Patient Care.
- Move victim to a cool area and shield from the sun or any external heat source.
- Remove as much clothing as is practical and loosen any restrictive garments.
- If alert and oriented, give small sips of cool liquids.
- Monitor and record vital signs and level of consciousness.
- **Obtain temperature – rectal temperature preferred as appropriate.**
- If temperature is 40°C (>104°F) or if altered mental status is present, begin active cooling by:
 - Continually misting the exposed skin with tepid water while fanning the victim (most effective).
 - Truncal ice packs **and wet towels/sheets** may be used, but are less effective than evaporation.
 - Discontinue active cooling **when the patient reaches 38.5°C (101.5°F), or if shivering occurs or cannot be managed by paramedics (see below).**

ADVANCED EMT STANDING ORDERS – ADULT & PEDIATRIC

A

- **Adult:** Consider 500ml 0.9% NaCl IV fluid bolus for dehydration even if vital signs are normal.
- **Pediatric:** Consider 10 – 20ml/kg 0.9% NaCl IV fluid bolus for dehydration even if vital signs are normal.

PARAMEDIC STANDING ORDERS- ADULT

P

- If uncontrolled shivering occurs during cooling:
 - Midazolam 2.5mg IV/IN, may repeat once in 5 minutes or; 5mg IM may repeat once in 10 minutes **OR**
 - Lorazepam 1mg IV, may repeat once in 5 minutes or; 2mg IM, may repeat once in 10 minutes **OR**
 - Diazepam 2mg IV, may repeat once in 5 minutes

PARAMEDIC STANDING ORDERS- PEDIATRIC



- If uncontrolled shivering occurs during cooling:
 - Midazolam 0.1mg/kg IV/IM or 0.2mg/kg IN (single maximum dose 1mg); Note: a 5mg/ml concentration is recommended for IN administration), **OR**
 - Lorazepam 0.1mg/kg IV/IM (single maximum dose 1mg), **OR**
 - Diazepam 0.2mg/kg IV or 0.5mg/kg **PR rectal** (single maximum dose 2mg IV or 4mg **PR rectal**)

PEARLS:

- Exertional hyperthermic patients often are significantly dehydrated, and may require repeat fluid bolus.
- Immersion colling is the most effective way to lower core body temperature if proper resources are available.

Hyperthermia:

Elevated temperature may be due to environmental exposure, pharmacologic agents, or excited/agitated delirium (see [Behavioral Emergencies 2.4](#)). Mortality and morbidity are directly related to the length of time the victim is subject to the heat stress.

EMT STANDING ORDERS - ADULT & PEDIATRIC

E

- Routine Patient Care.
- Avoid rough movement and excess activity.
- Prevent further heat loss:
 - Insulate from the ground and shield from wind/water.
 - Move to a warm environment.
 - Gently remove any wet clothing **and dry patient.**
 - Cover with warm blankets including the head and neck.
- Obtain temperature—rectal temperature preferred as appropriate.
- **Obtain blood glucose.**
- Maintain horizontal position.
- Apply truncal warm packs.
- Consider covering the patient’s mouth and nose with a surgical mask to prevent respiratory heat loss.
- A minimum of 45 – 60 second assessment of respirations and pulse is necessary to confirm respiratory arrest or cardiac arrest.
- If pulse and breathing are present, continue rewarming techniques.
- **If pulse and breathing are absent, start CPR see Cardiac Arrest Adult or Cardiac Arrest Pediatric.**
 - If core temperature is $<30^{\circ}\text{C}$ (86°F):
 - Continue CPR.
 - Apply AED and defibrillate.
 - If core temperature is $>30^{\circ}\text{C}$ (86°F) see Cardiac Arrest...

ADVANCED EMT - ADULT ONLY

PARAMEDIC STANDING ORDERS – ADULT & PEDIATRIC

A/P

- Warm IV 0.9% NaCl 38°C - 42°C (101.4°F – 107.6°F) should be used
- If pulse and breathing are absent:
 - If core temperature is $<35^{\circ}\text{C}$ (95°F) $<30^{\circ}\text{C}$ (86°F):
 - Continue CPR.
 - Give IV medications based on dysrhythmia (double dosing interval). ~~Attempt defibrillation once.~~ (ADULT: Use 360 joules for monophasic and 120 – 200 joules for biphasic defibrillators. PEDIATRIC: 2 joules/kg)
 - If core temperature is $>30^{\circ}\text{C}$ (86°F):
 - Continue CPR.
 - Give IV medications based on dysrhythmia (but at longer intervals).
 - Defibrillation as indicated.

STAGES OF HYPOTHERMIA AND ASSOCIATED SYMPTOMS

Stage	Temperature Range	Symptoms
Stage I	35°C – 32°C (95°F – 89.6°F)	Conscious, shivering.
Stage II	$<32^{\circ}\text{C}$ – 28°C ($<89.6^{\circ}\text{F}$ – 82.4°F)	Impaired consciousness, not shivering.
Stage III	$<28^{\circ}\text{C}$ – 24°C ($<82.4^{\circ}\text{F}$ – 75.2°F)	Unconscious, not shivering, vital signs present.
Stage IV	$<24^{\circ}\text{C}$ ($<75.2^{\circ}\text{F}$)	No vital signs.

PEARLS:

- Patients with severe frost bite injury may benefit from urgent treatment with IV TPA at a burn center.
- Most digital thermometers will not read below 35°C (95°F).
- Hypothermic patients are often significantly dehydrated, and may require repeat fluid boluses.
- Tranporation with continuing CPR may be justified if hypothermia is present or suspected.

2.9 Nausea/Vomiting - Adult & Pediatric

2015 DRAFT

EMT STANDING ORDERS- ADULT & PEDIATRIC

E

- Routine Patient Care.

ADVANCED EMT STANDING ORDERS- ADULT

A

- Consider 500 ml IV fluid bolus for dehydration even if vital signs are normal.
 - May repeat 250ml IV bolus if transport exceeds 15 minutes and patient's condition has not improved.

PARAMEDIC STANDING ORDERS- ADULT

P

- Ondansetron 4mg IV/ODT (oral dissolving tablets) **OR**
- Prochlorperazine 5 – 10mg IV, or 5mg IM, **OR**
- Metoclopramide 5mg IV **OR**
 - May repeat any of the above medications once after 10 minutes if nausea/vomiting persists.
- Granisetron 0.1 – 1mg IV over 5 minutes (one-time dose) **OR**
- Dolasetron 12.5mg IV (one-time dose).

For MCB Ondansetron ODT to the AEMT level

Antidote: For dystonic reactions caused by EMS administration of prochlorperazine or metoclopramide:

- Administer diphenhydramine 25 – 50mg IV/IM.

PARAMEDIC STANDING ORDERS- PEDIATRIC

- Consider 10 – 20ml/kg IV fluid bolus for dehydration even if vital signs are normal.
- Ondansetron 0.1mg/kg IV (maximum single dose 4mg), **OR**
- Ondansetron ODT 4mg **OR**
- Granisetron 10 micrograms/kg IV over 5 minutes (one-time dose).

ADVANCED EMT/PARAMEDIC EXTENDED CARE ORDERS

X

- For motion sickness: administer diphenhydramine:
 - Adult: 25 mg PO/chewed
 - Ages 2 – 5 years: 6.25 mg PO
 - Ages 6 – 11 years: 12.5 - 25 mg PO
- May repeat IM prochlorperazine or metoclopramide every 4 - 6 hours as needed. (Paramedic only)

PEARLS:

- To reduce incidence of dystonic reactions, administer prochlorperazine and metoclopramide slowly, over 1-2 minutes.
- Use caution with prochlorperazine for women of child bearing age.

ABSTRACT

Category II Project Title: Pediatric Evidence-Based Guidelines: Assessment of EMS System Utilization in States (PEGASUS)

Applicant Organization Name: Baylor College of Medicine

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PROBLEM: The Institute of Medicine notes the importance of evidence-based guidelines (EBGs) in improving the quality of care in Emergency Medical Services (EMS), especially for children. Several prehospital research agendas have also identified the development and validation of prehospital protocols as an area of needed research. This project will address this need by creating several pediatric prehospital EBGs and implementing them in multiple states. The populations served through this project are children who receive prehospital care in both urban and rural settings.

GOAL(S) AND OBJECTIVES: The goal of this project is to synthesize evidence into guidelines for pediatric prehospital care. The objectives are to utilize the National Prehospital EBG Model Process to develop several pediatric-relevant guidelines, implement them in selected regions, and evaluate their effectiveness after implementation.

METHODOLOGY: This project will establish a guideline development committee (GDC) comprised of stakeholders from the targeted implementation regions of Houston and New England (Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont) and train them in the EBG process, in order to create guidelines for pediatric prehospital shock, airway management, allergic reactions, and spinal immobilization. Two of these EBGs will be implemented in the Houston Fire Department EMS system, in order to develop clinical research questions for subsequent study, evaluate the effectiveness of care, and collect data for subsequent testing of therapies related to the two selected guidelines. These EBGs will then be implemented through the New England Council on EMS, in order to evaluate system and selected patient-level prehospital outcomes and identify barriers and enablers to statewide implementation of EBGs.

EVALUATION: GDC feedback will be used to evaluate the National Prehospital EBG Model Process in creating guidelines. Prehospital and hospital outcomes data will be used to assess the effectiveness of the EBGs. In addition, barriers and enablers to statewide implementation of EBGs will be assessed qualitatively.

ANNOTATION: The development of pediatric EBGs is necessary to improve the quality of prehospital care. Creating and assessing the implementation of such guidelines are this project's main goals. Evaluating the National Prehospital EBG Model Process and EMS system-level and patient-level outcomes are key methods utilized in this project. Distribution of guidelines for pediatric prehospital shock, airway management, allergic reactions and spinal immobilization are a major component of the dissemination plan. Sharing the findings from this project has the potential to impact pediatric prehospital care in both urban and rural settings in many states.

**INTEGRATING EVIDENCE-BASED PEDIATRIC PREHOSPITAL PROTOCOLS INTO PRACTICE
EMSC TARGETED ISSUES GRANT #H34MC19347**

**CHILDREN IN RESPIRATORY DISTRESS
PREHOSPITAL PROTOCOL**

Guideline Eligibility Criteria:

Children treated by Emergency Medical Service (EMS) agencies for the Houston Fire Department (HFD), Bio Tel (Dallas) and the City of Austin/Travis County with respiratory distress.

Guideline Exclusion Criteria:

Foreign body
Submersion
Anaphylaxis

Differential Diagnosis:

Asthma
Bronchiolitis
Croup/Epiglottitis
Pneumonia
Upper respiratory infections

History: Assess for

- Time of onset
- Foreign body aspiration
- Fever or infection
- Sick contacts
- Asthma
- Treatment (e.g., O₂, nebulizer)
- Medications (e.g., steroids, inhalers)
- Toxic exposure
- Trauma

Physical Examination: Assess for

- Shortness of breath
- Decreased ability to speak
- Abnormal respiratory rate and effort
- Wheezing, rhonchi, rales, stridor
- Use of accessory muscles
- Cough
- Tachycardia
- Anxious appearance
- Abnormal color (cyanosis, pallor)
- Abnormal mental status
- Abnormal oxygen saturation
- Adequacy of air entry

Practice Recommendations

Respiratory Assessment Tools

Prehospital providers should be taught to assess and document components of the Respiratory Distress Assessment Instrument (RDAI), Pediatric Asthma Severity Score (PASS), and Westley Croup respiratory scores. – Strong recommendation, Moderate quality evidence ⁽¹⁻⁹⁾

Monitoring

Pulse oximetry should be routinely used in children with respiratory distress as an adjunct to other forms of respiratory monitoring. – Strong recommendation, Low quality evidence ^(10,11)

Electrocardiogram (ECG) should not be routinely used for children with respiratory distress. If there are no signs of clinical improvement after treating the respiratory distress, consider ECG monitoring to assess for cardiac concerns. – Weak recommendation, Very low quality evidence ⁽¹²⁾

Measuring end-tidal CO₂ (ETCO₂) is safe, reliable and non-invasive and demonstrates a strong correlation with pulse oximetry; it should be used as an adjunct to other forms of respiratory monitoring. – Strong recommendation, Low quality evidence ⁽¹³⁻¹⁶⁾

Treatment

Supplemental oxygen should be provided to all children with respiratory distress. – Strong recommendation, Very low quality evidence ⁽¹⁷⁾

A child's nose and/or mouth should be suctioned (via bulb, Yankauer, suction catheter) if excessive secretions are present. – Strong recommendation, Very low quality evidence ⁽¹⁷⁾

Inhaled Medications

Beta-agonists should be administered to all children in respiratory distress with signs of bronchospasm (e.g. known asthmatics, quiet wheezers) in the prehospital setting, either via nebulized route or metered-dose inhaler, by basic life support (BLS) or advanced life support (ALS) providers. – Strong recommendation, Moderate quality evidence ⁽¹⁸⁻²⁴⁾

Nebulized anticholinergic medication (i.e., ipratropium) should be administered in multiple doses with short acting beta-agonist to children ≥ 2 years of age with known asthma who are in severe respiratory distress in the prehospital setting. – Strong recommendation, Moderate quality evidence ⁽²⁵⁻²⁷⁾

Hypertonic saline should not be administered to children in respiratory distress in the prehospital setting. – Weak recommendation, Low quality evidence ^(3,28,29)

Nebulized epinephrine should be administered to children in severe respiratory distress with presumed croup (e.g., have stridor at rest or barking cough) or refractory bronchiolitis (e.g. coarse breath sounds) in the prehospital setting if other treatments (e.g., suctioning, oxygen) fail to result in clinical improvement. – Strong recommendation, Moderate quality evidence ^(30,31)

Inhaled magnesium sulfate should not be administered to children in respiratory distress in the prehospital setting. – Weak recommendation, Low quality evidence ⁽³²⁾

Inhaled steam via a mist tent should not be administered to children in respiratory distress in the prehospital setting. – Weak recommendation, Moderate quality evidence ⁽³³⁾

Intravenous Magnesium

Intravenous magnesium sulfate should be administered to children with presumed asthma in impending respiratory failure. – Strong recommendation, Moderate quality evidence ^(32,34,35)

Utility of IV Placement and Fluids

IVs should only be placed in children with respiratory distress for clinical concerns of dehydration, or when administering IV medications. – Weak recommendation, Very low quality evidence ⁽³⁶⁻³⁸⁾

Steroids

Oral or parenteral steroids should be administered to children in respiratory distress with presumed asthma in the prehospital setting. – Strong recommendation, Moderate quality evidence ⁽³⁹⁻⁵²⁾

Steroids administered either IV or IM are no more effective than steroids administered orally in improving pulmonary function, asthma scores, and reducing readmission rates. – Strong recommendation, Moderate quality evidence ^(40,43-45,48,51,52)

Epinephrine (IM/SQ/IV)

Epinephrine should only be administered to children with impending respiratory failure as adjunct therapy to albuterol when there are no clinical signs of improvement. – Strong recommendation, Moderate quality evidence ^(4,53-56)

Improvement of Oxygenation and/or Respiratory Distress with Non-invasive Airway Adjuncts

Continuous Positive Airway Pressure (CPAP) for bronchospasm should be administered to children in severe respiratory distress. – Weak recommendation, Low quality evidence ⁽⁵⁷⁻⁶¹⁾

Bag-Valve-Mask Ventilation should be utilized in children with respiratory failure. – Strong recommendation, Moderate quality evidence ^(62,63)

Heliox should not be routinely administered to children with respiratory distress. – Strong recommendation, Moderate quality evidence ⁽⁶⁴⁻⁶⁸⁾

Supraglottic Devices and Intubation

Supraglottic devices and intubation should be utilized only if bag-valve-mask ventilation fails. The airway should be managed in the least invasive way possible. – Weak recommendation, Very low quality evidence ^(37,63,69)

Transport

Routine use of lights and sirens (Code 3 transport) is not recommended during transport. – Strong recommendation, Low quality evidence ⁽⁷⁰⁻⁷²⁾

Measures

Process

Prehospital on-scene time

Prehospital transport time

CPAP utilization

IV/IO placement

Time to administration of specified interventions in the protocol

Rate of administration of accepted therapy (Y/N: whether or not certain medications/interventions were given)

Outcome

ED length of stay (LOS)

Hospital admission rate

LOS in ED observation unit

LOS in hospital

LOS in Pediatric Intensive Care Unit (PICU)

Change in vital signs (i.e., heart rate, blood pressure, temperature, respiratory rate, pulse oximeter, capnography values)

Time to administration of specified interventions in the protocol

Rate of administration of accepted therapy

Number of advanced airway attempts

Cost of hospital care

Knowledge retention of prehospital providers

Mortality

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Protocol Preparation

This protocol was funded by a Health Resources and Services Administration (HRSA) Emergency Medical Services for Children (EMSC) Targeted Issues grant. All documents were prepared by the Evidence-Based Outcomes Center (EBOC) Team in collaboration with content experts from Texas Children's Hospital (TCH), HFD, City of Austin/Travis County EMS, Hospital Physicians in Clinical Research, Dell Children's Medical Center of Central Texas, BioTel EMS, and Children's Medical Center Dallas. Development of this guideline supports the TCH Quality and Patient Safety Program initiative to promote clinical guidelines and outcomes.

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Development Process

This protocol was developed using a modification to the process outlined in the EBOC Manual (2010). The review summary documents the following steps:

1. Review Preparation
 - PICO questions established
 - Evidence search confirmed with protocol committee
2. Review of Existing Internal and External Guidelines
 - HFD Breathing Difficulty: Wheezes (Asthma/Bronchiolitis); UT Southwestern Medical Center at Dallas/BioTel EMS System Respiratory Distress; City of Austin/Travis County EMS System Pediatric Respiratory Distress
3. Literature Review of Relevant Evidence
 - Searched: PubMed, Cochrane Library, Emergency Medicine Journal: EMJ, Emergency Medical Services, EMS Magazine, EMS World, International Journal of Emergency Medicine (aka Emergency Medicine)
4. Critically Analyze the Evidence
 - 24 Systematic Reviews; 19 Randomized Controlled Trials; 30 Non-Randomized Trials
5. Summarize the Evidence by preparing the protocol
 - Materials used in the development of this protocol are maintained by the Primary Investigator in a Children with Respiratory Distress Evidence-based (EB) development binder.

Evaluating the Quality of the Evidence

Published clinical guidelines were evaluated for this review using the **AGREE** criteria. The summary of these guidelines are included in the evidence summary. AGREE criteria evaluate Guideline Scope and Purpose, Stakeholder Involvement, Rigor of Development, Clarity and Presentation, Applicability, and Editorial Independence using a 1-4 point Likert scale. The higher the score, the more comprehensive the guideline.

The **Critical Appraisal Skills Program (CASP)** criteria were used to evaluate the quality of individual articles. Application of the CASP

criteria are used to rate each study, meta-analysis, or systematic review as:

Strong study/systematic review – well designed, well conducted, adequate sample size, reliable measures, valid results, appropriate analysis, and clinically applicable/relevant

Study/Systematic review with minor limitations – specifically lacking in one of the above criteria

Study/Systematic review with major limitations – specifically lacking in several of the above criteria

This guideline specifically summarizes the evidence *in support of or against* specific interventions and identifies where evidence is *lacking/inconclusive*. The following categories describe how research findings provide support for treatment interventions.

“Evidence that supports” the guideline provides clear evidence from well-designed randomized controlled trial(s) [RCT(s)] that the benefits of the intervention exceed harm.

“Evidence against” provides clear evidence from more than one well-done RCT that the intervention is likely to be ineffective or that it is harmful.

“Evidence lacking/inconclusive” indicates there is currently insufficient data or inadequate data to support or refute a specific intervention.

The **GRADE** criteria were utilized to evaluate the body of evidence used to make clinical recommendations. The table below defines how the quality of the evidence is rated and how a strong versus weak recommendation is established. The evidence summary reflects the critical points of evidence.

Recommendation	
STRONG	Desirable effects clearly outweigh undesirable effects or vice versa
WEAK	Desirable effects closely balanced with undesirable effects
Quality	Type of Evidence
High	Consistent evidence from well-performed RCTs or exceptionally strong evidence from unbiased observational studies
Moderate	Evidence from RCTs with important limitations (e.g., inconsistent results, methodological flaws, indirect evidence, or imprecise results) or unusually strong evidence from unbiased observational studies
Low	Evidence for at least 1 critical outcome from observational studies, RCTs with serious flaws or indirect evidence
Very Low	Evidence for at least 1 critical outcome from observational studies, RCTs with serious flaws or indirect evidence

Recommendations

Recommendations for the guidelines were directed by the existing evidence, protocol committee members, and consensus. Patient and family preference were included when possible. The Protocol Committee and EBOC Team remain aware of the controversies in treating children in respiratory distress. When evidence is lacking, options in care are provided in the protocol.

Approval Process

Developed content was reviewed and approved by the Protocol Committee members previously listed. Content and recommendations were shared with respective EMS and ER colleagues for feedback and review.

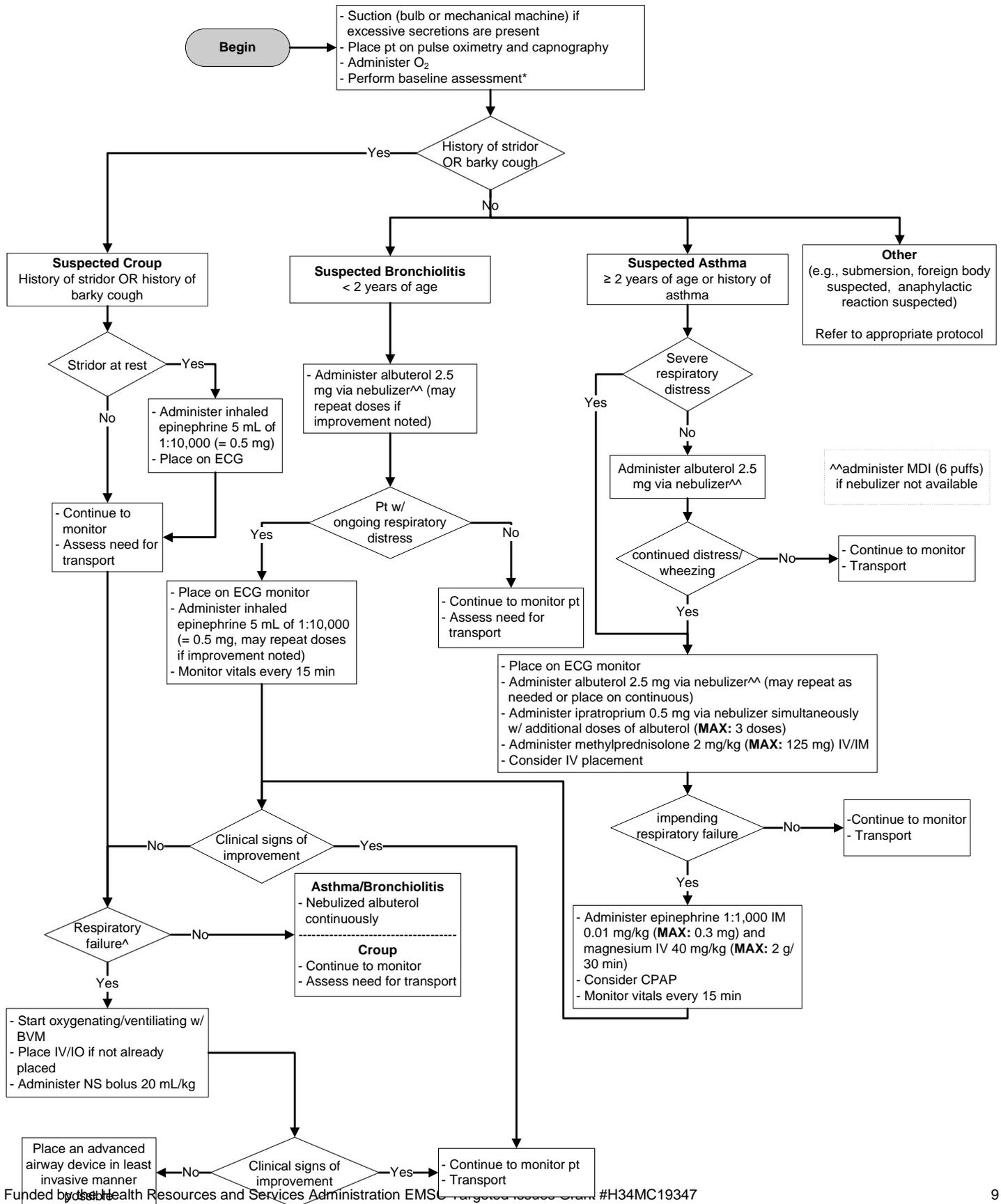
Disclaimer

Guideline recommendations are made from the best evidence, clinical expertise and consensus, in addition to thoughtful consideration for the patients and families cared for within the Integrated Delivery System. When evidence was lacking or inconclusive, content experts made recommendations based on consensus. Expert consensus is implied when a reference is not otherwise indicated. The guideline is not intended to impose standards of care preventing selective variation in practice that is necessary to meet the unique needs of individual patients. The physician must consider each patient and family's circumstance to make the ultimate judgment regarding best care.

Appendix A

Children with Respiratory Distress- Algorithm

Integrating Evidence-Based Pediatric Prehospital Protocols into Practice Children with Respiratory Distress



***Baseline Assessment**

- Vital signs
- Work of breathing (retractions, supraclavicular, intercostal, subcostal)
- Breath sounds
 - wheezing - expiratory, inspiratory, # of lung fields involved
 - expiratory phase
 - other sounds - rales, crackles
 - stridor
- Air entry (good, diminished, absent)
- Skin color (normal, pale, cyanotic w/ agitation, cyanotic at rest)
- Mental status (normal, restless, lethargic/depressed)

^Respiratory failure (per PALS)

- inadequate ventilation
- insufficient oxygenation
- Anticipate respiratory failure if:*
 - increased respiratory rate, particularly w/ signs of distress (e.g., nasal flaring, retractions, seesaw breathing, grunting)
 - inadequate respiratory rate, effort, or chest excursion (e.g., diminished breath sounds, gasping)
 - cyanosis w/ abnormal breathing despite suppl O₂

Baseline Assessment Category	No Respiratory Distress	Respiratory Distress
Vital signs	Normal RR and O ₂	Fast or slow RR for age O ₂ < 90%
Work of breathing	No accessory muscle use	Supraclavicular, subcostal, or intercostals retractions
Breath sounds - <i>Adventitial sounds</i> - <i>Wheezing</i> - <i>Stridor</i>	Clear No wheezing with normal expiratory phase Stridor absent	Rales, rhonchi, or crackles Expiratory, inspiratory, or both; also document lobes affected Prolonged expiratory phase Inspiratory or expiratory stridor present
Air entry	Good	Diminished or absent
Skin color	Pink	Pale or dusky/cyanotic
Mental status	Alert/normal	Restless or lethargic/depressed

Appendix B

Children with Respiratory Distress- Evidence Summary

PICO Questions

The following PICO questions were addressed by the content experts from Texas Children's Hospital, HFD, City of Austin/Travis County EMS, Hospital Physicians in Clinical Research, Dell Children's Medical Center of Central Texas, BioTel EMS, and Children's Medical Center Dallas in creation of the evidence-based Children with Respiratory Distress Prehospital Protocol. Refer to the Evidence-Based Practice Summary for the complete evidence summary including GRADE tables.

Question 1: In children with respiratory distress, which validated respiratory assessment tools can be used in the prehospital setting?

Question 2: In children with respiratory distress, is pulse oximetry sufficient in monitoring a child's respiratory status in the prehospital setting?

- a. In children with respiratory distress, should pulse oximetry be routinely used?
- b. In children with respiratory distress, what are the limitations of solely utilizing pulse oximetry monitoring?

Question 3: In children with respiratory distress, is it clinically efficacious to use electrocardiogram (ECG) monitoring?

Question 4: In children with respiratory distress, is the routine application of oxygen in the absence of hypoxia clinically effective?

Question 5: In children with respiratory distress, is airway suctioning effective in improving:

- a. Oxygenation
- b. Clinical signs of distress

Question 6: In children with respiratory distress, are the following inhaled medications clinically effective (i.e., decreased distress, shorter ED length of stay, decreased admission rates to the hospital):

- a. Albuterol
- b. Levalbuterol (Xopenex)
- c. Ipratropium (Atrovent)
- d. Hypertonic saline (3%, 5%.)
- e. Racemic epinephrine
- f. Magnesium sulfate
- g. Steam

Question 7: In children with respiratory distress, does the use of intravenous magnesium sulfate in the prehospital setting result in clinical improvement (e.g. decreased stress, shorter ED length of stay, decreased admission rates to the hospital)?

Question 8: In children with respiratory distress in the prehospital setting, is it efficacious (e.g., lead to better clinical outcomes) to place an IV?

Question 9: In children with respiratory distress in the prehospital setting, do steroids (any route) lead to improved clinical outcomes? What is the preferred route?

Question 10: In children with respiratory distress in the prehospital setting, when are IV fluids clinically effective and useful?

Question 11: In children with respiratory distress in the prehospital setting, does epinephrine (IM/SQ/IV) lead to improved clinical outcomes?

Question 12: In children with respiratory distress, what are the clinical situations in which the following non-invasive airway adjuncts improve oxygenation and/or respiratory distress:

- a: Continuous positive airway pressure (CPAP)
- b: Bag valve mask ventilation
- c: Heliox

Question 13: In children with respiratory distress in the prehospital setting, do supraglottic devices and intubation lead to improved clinical outcomes? What are the indications and contraindications for using a supraglottic device or intubating?

Question 14: In children with respiratory distress, is the use of capnography efficacious and clinically useful?



Question 15: In children with respiratory distress, are there improved patient outcomes when an online medical direction is contacted versus no online medical direction is contacted?

Question 16: In children with respiratory distress, are there improved patient outcomes when patients are transported by Advanced Life Support (ALS) providers as compared to Basic Life Support (BLS) providers?

Question 17: In children with respiratory distress, is it clinically efficacious to transport with lights and sirens?