INTRODUCTION

Ohio emergency medical services (EMS) providers strive every day to deliver the highest standard of emergency medical services to the people of Ohio. On behalf of the State Board of Emergency Medical, Fire, and Transportation Services (EMFTS Board), the Ohio Emergency Medical Services for Children Program was charged with drafting proposed guidelines that EMS agencies could use in setting that standard.

The original State of Ohio Pediatric EMS Guidelines and Procedures Manual was created in 2013. In 2016, the EMFTS Board approved utilization of the National Association of State EMS Officials (NASEMSO) National Model EMS Clinical Guidelines, the first evidence-based, consensus-based, and patient-centric EMS guideline document ever created, as a foundation for all of the State of Ohio EMS guideline documents. This is the first edition of the State of Ohio Pediatric EMS Guidelines and Procedures Manual that incorporates elements of the NASEMSO National Model EMS Clinical Guidelines, and it will support the EMFTS Board’s goal to adopt evidence-based measures that demonstrate improved patient care and outcomes.

Please note that the proposed guidelines are not mandatory for Ohio EMS agencies. The guidelines and procedures manual is meant to assist in the development of local protocols. It is the Board’s hope that individual regions or agencies will review these guidelines with their medical directors and legal counsel when drafting their own individualized protocols. The guidelines will be periodically reviewed by the Emergency Medical Services for Children Committee in order to maintain the most current information available.

Reviewed by: Emergency Medical Services for Children Committee
Approved by: State Board of Emergency Medical, Fire, and Transportation Services
February 11, 2021
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USING THE PEDIATRIC GUIDELINES

The pediatric guidelines are color-coded for quick and easy reference, and represent the scope of practice as recommended by the Ohio EMSC Committee. In some cases, this differs from Ohio’s scope of practice. Consult your medical director should questions arise regarding scope of practice.

Please see the color-coded key below to determine how to use the guidelines.

**PARAMEDICS** may perform all instructions coded:

- PARAMEDIC
- AEMT
- EMT

**ADVANCED EMERGENCY MEDICAL TECHNICIANS (AEMT)** may perform all instructions coded:

- AEMT
- EMT

**EMERGENCY MEDICAL TECHNICIANS (EMT)** may perform all instructions coded:

- EMT
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ANAPHYLAXIS/ALLERGIC REACTIONS

GENERAL CONSIDERATIONS

A. Allergic reactions and anaphylaxis are serious and potentially life-threatening medical emergencies. It is the body’s adverse reaction to a foreign protein (e.g. food, medicine, pollen, insect sting or any ingested, inhaled, or injected substance). A localized allergic reaction (e.g. urticaria or angioedema that does not compromise the airway) may be treated with antihistamine therapy. When anaphylaxis is suspected, EMS personnel should always consider epinephrine as first-line treatment. Cardiovascular collapse may occur abruptly, without the prior development of skin or respiratory symptoms. Constant monitoring of the patient's airway and breathing is essential.

B. Contrary to common belief that all cases of anaphylaxis present with cutaneous manifestations, such as urticaria or mucocutaneous swelling, a significant portion of anaphylactic episodes may not involve these signs and symptoms on initial presentation. Moreover, most fatal reactions to food-induced anaphylaxis in children are not associated with cutaneous manifestations.

EMT

A. Evaluate:

1. For patent airway and presence of oropharyngeal edema.
2. Auscultate for wheezing and assess level of respiratory effort.
3. Assess for adequacy of perfusion.
4. Assess for presence of signs of anaphylaxis -- more severe allergic reaction characterized by two or more of the following occurring rapidly after an exposure:
   a. Skin and/or mucosal involvement (urticaria, itchy, swollen tongue/lips)
   b. Respiratory compromise (dyspnea, wheeze, stridor, hypoxemia)
   c. Persistent gastrointestinal symptoms (vomiting, abdominal pain, diarrhea)
   d. Hypotension or associated symptoms (syncope, hypotonia, incontinence)

B. Place child in position of comfort, encourage parent to help keep child calm.

C. Quickly obtain history including any recent intake of any known allergens, recent medication intake, and/or insect bites or stings.

D. Assess vital signs, airway, breathing, and perfusion.

E. If respiratory effort is insufficient or patient is becoming unconscious, assist ventilations with BVM

F. Determine if allergic reaction meets criteria for anaphylaxis.

1. If meets criteria for anaphylaxis:
   a. Ensure patent airway and support with non-rebreather mask oxygen unless they require BVM ventilation instead.
   b. Ask patient or bystanders if an epinephrine injector has been prescribed for these situations. If they have the medication with them, assist with the administration of medication per protocol, then transport patient.
   c. If epinephrine is not available, transport immediately unless ALS unit is en route and has an ETA of less than 5 minutes.
ANAPHYLAXIS/ALLERGIC REACTIONS (Continued)

AEMT/ PARAMEDIC

A. Assume charge of situation.

B. Reassess airway, breath sounds, and perfusion.

C. Obtain vital signs.

D. If patient meets criteria for anaphylactic allergic reaction:

1. Epinephrine 1 mg/mL (1:1,000)
   a. If epinephrine auto-injectors are available, administer 0.15 mg IM to patients who weigh 15 kg or less and 0.3 mg IM to patients who weigh greater than 15 kg in anterolateral thigh.
   b. If auto-injectors are not available, administer epinephrine 1 mg/mL 0.01 mg/kg (0.01 mL/kg) IM (maximum dose 0.3 mg [0.3 mL] in anterolateral thigh.

2. Diphenhydramine 1 mg/kg IM or IV (maximum dose 50 mg) after epinephrine administration.

3. Albuterol 2.5 mg, nebulized if respiratory distress with wheezing is present.

4. Epinephrine 1 mg/mL, 0.5 mL mixed in 2.5 mL of normal saline, nebulized if respiratory distress with stridor is present.

E. Even if the patient does not meet anaphylaxis criteria, administer diphenhydramine 1 mg/kg IM, IV, PO (maximum dose 50 mg) if it has not been administered already.

F. Do not attempt placement of an advanced airway unless the child has a respiratory arrest.

G. If signs of anaphylaxis and hypoperfusion persist following the first dose of epinephrine, additional IM epinephrine can be repeated every 5 minutes.

H. For signs of shock, administer 20 mL/kg isotonic fluid (normal saline or lactated Ringer’s) over 15 minutes via IV or IO, and repeat as needed for ongoing hypoperfusion. Contact medical control for patients with ongoing hypoperfusion despite IM epinephrine and a 20 mL/kg bolus of isotonic fluids. Consider epinephrine infusion IV if continued hypotension (epinephrine IV continuous dose 0.1 to 1 mcg/kg/min, titrate to effect).

I. Transport as soon as possible, and perform ongoing assessment. Cardiac monitoring is not required, but should be considered for those with known heart problems or those who received multiple doses of epinephrine.
ANAPHYLAXIS/ALLERGIC REACTIONS

EMT → AEMT → PARAMEDIC

Evaluate (and support if necessary) airway, wheezing and respiratory effort, & for signs of shock. Assess for anaphylaxis

Position of comfort and keep child CALM

Obtain a SAMPLE history and recent exposures

If anaphylaxis and autoinjector prescribed, help with administration

If anaphylaxis, administer epinephrine IM, diphenhydramine, & albuterol for wheezing

Administer diphenhydramine even if does not meet anaphylaxis criteria

Administer nebulized epinephrine for stridor

For signs of shock, administer an isotonic fluid bolus over 15 minutes by IO or IV. Contact medical control for ongoing signs of shock and consider epinephrine infusion

Transport as soon as possible
ALtered level of consciousness

EMT
A. Assess ABCs. Manually stabilize cervical spine as per Trauma Protocol if cause of unconsciousness is unknown.
B. If not breathing, assist ventilation with BVM while administering 100% oxygen.
C. If breathing effectively, administer 100% oxygen by NRB mask.
D. Evaluate patient's general appearance, relevant history of condition and determine:
   - Symptoms
   - Allergies
   - Medication
   - Past Medical History - especially, diabetic, seizures, stroke, head injury, drug abuse
   - Last Meal
   - Events leading to present illness
E. Obtain and document a pulse oximetry and capnography measurement.
F. If an opioid overdose is suspected and respirations are impaired, administer naloxone (Narcan®) 0.1 mg/kg (maximum 4 mg) IN (maximum volume of 1 mL per nostril) or naloxone 2 mg per auto-injector IM (EVZIO®). Pulseless patients or those with a weak or slow pulse following a known or suspected opioid overdose should be managed as cardiac arrest patients. Standard resuscitative measures should be initiated immediately and should take priority over naloxone administration or waiting for a response from previously administered naloxone.
G. Determine blood sugar level by available means.
   1. If blood sugar is less than 60 mg/dL, administer oral glucose if patient is alert. May be repeated in 10 minutes if blood sugar remains below 60 mg/dL.
   2. If blood sugar is greater than 400 mg/dL, initiate transport.
   3. If unable to check blood sugar or blood sugar is between 60 mg/dL and 400 mg/dL, establish communications with medical control and advise of patient condition.
H. If blood sugar is normal, respirations are impaired, or patient does not respond to dextrose, administer naloxone (Narcan®) 0.1 mg/kg IN (maximum volume of 1 mL per nostril) or naloxone 2 mg per auto-injector IM (EVZIO®). Refer to most current version of length-based drug treatment guide (e.g. BROSELOW® PEDIATRIC EMERGENCY TAPE or similar guide) when unsure about patient weight, age, and/or drug dosage. Pulseless patients or those with a weak or slow pulse following a known or suspected opioid overdose should be managed as cardiac arrest patients. Standard resuscitative measures should be initiated immediately and should take priority over naloxone administration or waiting for a response from previously administered naloxone.
I. Transport immediately unless an advanced life support unit is en route and has an ETA of less than 5 minutes to the scene.

AEMT/ PARAMEDIC
A. Assume charge of situation and confer with EMS professionals about condition of patient and situation.
B. Assess airway adequacy and assist ventilation with BVM while administering 100% oxygen. May consider intubation.
ALTERED LEVEL OF CONSCIOUSNESS (Continued)

C. Check heart rhythm.

D. Start IV/IO. If any of the following are present: unresponsiveness, dehydrated or dry appearance, tachycardia, low BP, or poor capillary refill, administer a fluid bolus of 20 mL/kg normal saline IV/IO push.

E. Determine blood sugar level by available means. Treat accordingly:

1. Blood sugar less than 60 mg/dL, administer an IV bolus:
   a. 5 mL/kg of 10% dextrose (D10W), maximum 250 mL
   b. May be repeated in 10 minutes if blood sugar remains below 60 mg/dL.

2. Blood sugar greater than 400 mg/dL and signs of hypoperfusion are present, administer an IV fluid bolus:
   a. 20 mL/kg of normal saline, maximum 1 L
   b. May be repeated if no response in 10 minutes.

F. If blood sugar is normal, respirations are impaired, or patient does not respond to dextrose or fluid bolus, administer naloxone (Narcan®) 0.1 mg/kg IV, IO, ET, IM, or IN (maximum volume of 1 mL per nostril) or naloxone 2 mg per auto-injector IM (EVZIO®). Refer to most current version of length-based drug treatment guide (e.g. BROSELOW® PEDIATRIC EMERGENCY TAPE or similar guide) when unsure about patient weight, age, and/or drug dosage. If patient improves somewhat with naloxone but is not fully awake, contact medical control for repeat dose. Pulseless patients or those with a weak or slow pulse following a known or suspected opioid overdose should be managed as cardiac arrest patients. Standard resuscitative measures should be initiated immediately and should take priority over naloxone administration or waiting for a response from previously administered naloxone.

G. Re-evaluate patient condition, contact medical control, and transport to the hospital.

H. In some cases, patient may require restraint, and should not be transported until appropriately restrained.
ALERTED LEVEL OF CONSCIOUSNESS

EMT

Assess airway, breathing (assist with BVM and 100% O2 if necessary), & stabilize c-spine if trauma related

AEMT/PARAMEDIC

Unless BVM, 100% O2 by NRB mask

Obtain SAMPLE history, vital signs, pulse oximetry and capnography

Administer naloxone for suspected opioid overdose

Determine blood sugar level and treat hypoglycemia with oral glucose

Transport immediately unless ALS is quickly available

Assume charge of scene. If ventilations are being assisted by BVM, consider need for advanced airway

Check heart rhythm. Start IV/IO. For signs of shock, administer an isotonic fluid bolus over 15 minutes

Determine blood sugar level and treat hypoglycemia with IV dextrose

For respiratory depression, administer a dose of naloxone and note response

Contact medical control and transport to the hospital
CHILD ABUSE AND NEGLECT

GENERAL CONSIDERATIONS

A. Child abuse and neglect happen in all socioeconomic, racial, cultural, or religious boundaries. EMS professionals will eventually see some form of abuse or neglect. Prehospital personnel are in a unique position in their ability to make the initial identification of these victims. EMS professionals should always believe what the child says, document the exact statements on the prehospital care report, and communicate them clearly to the healthcare providers upon arriving to the receiving facility.

B. Recognize any act or series of acts of commission or omission by a caregiver or person in a position of power over the patient that results in harm, potential harm or threat of harm to a patient.

C. Initiate treatment as necessary for situation using established protocols.

D. If possible, remove the child from the scene, transporting to hospital even if there is no medical reason for transport identified.

E. If parents refuse permission to transport, notify law enforcement for appropriate disposition. If patient is in immediate danger, let law enforcement handle scene.

F. Advise caregiver to go to hospital. Avoid accusations as this may delay transport. Adult with child may not be the abuser. Caregivers that are apathetic, over react or give inconsistent stories for pattern of injury observed should be identified to law enforcement.

G. Carefully document findings and report to physicians at the hospital. An EMS professional must also report or assure that actual or suspected child abuse/neglect is reported to the local law enforcement agency or the Children’s Protective Services Board.

EMT/AEMT/ PARAMEDIC

A. Evaluate

1. Start with a primary survey and identify any potentially life-threatening issues
2. Document thorough secondary survey to identify clues of potential abuse/maltreatment:
   a. Inability to communicate due to developmental age, language and/or cultural barrier
   b. Multiple bruises in various stages of healing
   c. Age-inappropriate behavior (e.g. adults who are submissive or fearful, children who act in a sexually inappropriate way)
   d. Pattern burns, bruises, or scars suggestive of specific weaponry used
   e. Evidence of medical neglect for injuries or infections
   f. Unexplained trauma to genitourinary systems or frequent infections to this system
   g. Evidence of malnourishment and/or serious dental problems
3. Assess physical issues and avoid extensive investigation of the specifics of abuse or maltreatment, but document any statements made spontaneously by patient
   a. Avoid asking directed questions of a child

B. Address life-threatening issues.

C. Remove the patient to a safe place even if no medical indication for transport.

D. Report concerns about potential abuse/maltreatment to law enforcement immediately, in accordance with state law, about caregivers impeding your ability to assess/transport patient, caregivers refusing care for the patient.

E. For patients transported, report concerns to hospital and/or law enforcement personnel per mandatory reporting laws.
HUMAN TRAFFICKING

Human trafficking is the abduction or coercion of a person, of any age, into service. According to the U.S. Department of Homeland Security, human trafficking is the second fastest growing criminal industry in our nation with drug trafficking currently maintaining the lead. Emergency departments are the primary source of medical care for victims as it facilitates the avoidance of detection and tracking. Victims rarely present a government-issued form of identification. The trafficker often presents himself/herself as the victim’s relative (e.g. sibling) or spouse to provide a more viable reason to remain with the victim during patient transport or during the course of medical care. When accessing the healthcare system or entering a healthcare facility alone, the victim will often desire or demand a brief and/or accelerated evaluation or to be discharged after a brief period of time due to threats from the trafficker if time limits are exceeded or if the trafficker is monitoring the victim from a remote location.

Physical Clues on Patient Assessment
A. Multiple bruises in various stages of healing
B. Age-inappropriate behavior (e.g. adults who are submissive or fearful, children who act in a sexually inappropriate way)
C. Pattern burns, bruises, or scars suggestive of specific weaponry used
D. Evidence of medical neglect for injuries or infections
E. Unexplained trauma to genitourinary systems or frequent infections to this system
F. Evidence of malnourishment and/or serious dental problems
G. Injuries not appropriate for patient’s age or physical abilities (e.g. infants with injuries usually associated with ambulatory children, elders who have limited mobility with injury mechanisms inconsistent with their capabilities)
H. Tattoos and/or branding is common in victims of human trafficking as they are placed by the trafficker as a label of ownership. While some traffickers use their initials or a specific design in a tattoo, there has been a trend to use barcode-like tattoos. In addition to the chest, neck, or extremities, traffickers will also use less visible sites, such as the inferior surface of the victim’s tongue, to place a tattoo symbolizing ownership.

Clues Arising from the Caregiver
A. Apathy about patient’s current situation
B. Overreaction to questions about situation
C. Inconsistent histories from caregivers or bystanders regarding what happened
D. Information provided by caregivers or patient that is not consistent with injury patterns
E. Caregiver not allowing adult patient to speak for themselves, or who appears controlling

Environment Clues
A. Inadequate safety precautions or facilities where the patient lives
B. A state of squalor in the residence
C. Evidence of security measures that appear to confine the patient inappropriately (e.g. interior doors with padlocks or missing doorknobs, boards or other obstructive objects over intact windows)

Reporting Abuse and Maltreatment
A. It is imperative for EMS professionals to communicate and document all information to the emergency department and/or receiving facility’s staff including, but not limited to, the patient’s physical findings and emotional condition, the caregiver’s demeanor and interactions, and the condition and abnormal findings of the environment noted while on scene
B. Reporting of suspected or confirmed child abuse and/or maltreatment is mandatory by Ohio law and provides civil immunity to the individual who files the report
C. Currently, there is no immunity provided for reporting suspected or confirmed abuse and/or maltreatment of adults; however, it is highly unlikely to be sued successfully for initiating an investigation unless it is an act of willful or wanton misconduct by the reporter
D. Adult Protective Services and Child Protective Services are excellent resources to initiate a report of suspected or confirmed abuse and/or maltreatment particularly in cases where patient transport is ultimately refused. A request placed to the EMS medical director to acquire social services consultation for the patient is another option.
E. Law enforcement agencies are also excellent resources to initiate a report of suspected or confirmed abuse and/or maltreatment particularly when it involves human trafficking or financial, physical or sexual abuse.
CHILD ABUSE AND NEGLECT

EMT

AEMT/PARAMEDIC

Identify and address potential life-threatening issues

Document clues of potential abuse or maltreatment or human trafficking

Remove patient to safe place. Save directed questions about abuse to trained forensic interviewers

Report concerns about potential abuse or maltreatment, human trafficking or caregivers' uncooperativeness to law enforcement immediately
ARRHYTHMIAS

GENERAL CONSIDERATIONS
A. In the treatment of cardiac arrhythmias, the current American Heart Association PALS and ACLS guidelines were referenced for guideline development.

B. Always provide oxygen support, make the patient comfortable, and provide reassurance.

C. Transport is essential when Pediatric or Advanced Cardiac Life Support is not available within 10 minutes of receipt of the call.

EMT / AEMT
A. Open and manage the airway and provide 100% oxygen by NRB mask. Apply pulse oximeter.

B. Make patient comfortable and provide reassurance.

C. Evaluate patient's general appearance, relevant history of condition and determine:
   - Onset of the event
   - Provocation or palliation
   - Quality of the pain
   - Region and radiation
   - Severity
   - Time
   - Signs and symptoms
   - Allergies
   - Medications
   - Past Medical History - especially, recent surgery, any abnormal related ingestion, previous trauma, related medical diseases
   - Last oral intake
   - Events leading to present illness

D. If patient is experiencing an unusual and/or irregular heart rate or pulse, if available, application of the cardiac monitor may be applied by the AEMT with assistance from the EMT if necessary. The AEMT may obtain a monitor strip for evaluation by the physician at the emergency department. This should only be done during transport, and the EMS professional must advise the patient the monitor strip is being obtained solely for the physician and the EMS professional cannot provide the patient with an interpretation of the strip.

E. Establish communications with medical direction and advise them of patient condition. Transport immediately unless an advanced life support unit is in route and has an ETA of less than 5 minutes to the scene.

PARAMEDIC
A. Assume charge of situation and confer with EMS professionals about condition of patient and situation.

B. Apply cardiac monitor and determine arrhythmia.

C. Start IV/IO normal saline (NS) at a "keep vein open" (KVO) rate.
ARRHYTHMIAS (Continued)

D. Treat arrhythmia as follows:

1. Bradycardia

   NOTE: If heart rate is <100 for infants, <80 for children and <60 for adolescents assess patient’s perfusion. The most common cause of pediatric bradycardia is hypoxia. Signs or symptoms of poor perfusion include:
   - Hypotension
   - Acutely altered mental status
   - Signs of shock
   - Acute heart failure
   - History of pacemaker or heart surgery
   - If patient may have ingested calcium channel blockers, beta blocker or digoxin, consider calling medical control for appropriate antidote.

   a. Good perfusion
      i. Transport
      ii. If second-degree heart block type II or third-degree heart block, prepare patient for external pacing by applying external pacer pads. If the patient develops signs of poor perfusion, initiate external pacing.

   b. Poor perfusion
      i. Initiate quality CPR if the heart rate is ˂60 and administer oxygen
         NOTE: Pacing should be initiated after adequate ventilation and atropine and epinephrine have been administered. Medications may be given while preparing for pacing.
      ii. Atropine 0.02 mg/kg (maximum dose of 0.5 mg) rapid IVP, may repeat once in 5 minutes to achieve age appropriate heart rate and an adequate systolic blood pressure (SBP) for age (SBP greater than 2x age in years + 70 mmHg) with adequate level of consciousness.
      iii. If perfusion is poor after maximum dose of atropine, initiate dopamine IV infusion of 2-20 microgram/kg/minute or epinephrine IV infusion of 0.1-1 microgram/kg/minute titrated to an age appropriate systolic BP or until the patient’s level of consciousness improves.

2. Narrow complex tachycardia

   NOTE: If heart rate is ≥220 beats per minute for infants, ≥180 beats per minute for children, assess patient’s perfusion. Signs/symptoms of poor perfusion include:
   - Hypotension
   - Acutely altered mental status
   - Signs of shock
   - Acute heart failure
   - History of arrhythmia
   - History of cardiac surgery

   a. Good perforusion
      i. Vagal maneuver or carotid massage or knees to chest
      ii. Adenosine 0.1 mg/kg or maximum dose of 6 mg rapid IV push followed immediately by a 10 mL flush of normal saline
      iii. If no response in 1-2 minutes, adenosine 0.2 mg/kg or maximum dose of 12 mg rapid IV push followed immediately by a 10 mL flush of normal saline.
      iv. If the patient does not respond to adenosine, consider contacting medical control for orders for additional medications.
      v. If patient remains stable, observe and transport.

      NOTE: If at any time the patient becomes unstable with poor perfusion, go directly to synchronized cardioversion.
ARRHYTHMIAS (Continued)

b. Poor perfusion

NOTE: Based on assessment findings, the Paramedic may choose to administer adenosine before attempting synchronized cardioversion if the ventricular complexes (QRS waves) are regular and narrow. If the patient is unstable with poor perfusion, the Paramedic may omit adenosine administration and proceed immediately to synchronized cardioversion.

i. Adenosine 0.1 mg/kg or maximum dose of 6 mg rapid IV/IO push followed immediately by a 10 mL NS flush IV/IO.

ii. If no response in 1-2 minutes, adenosine 0.2 mg/kg or maximum dose of 12 mg rapid IV/IO push followed immediately by a 10 mL NS flush IV/IO.

iii. Consider sedation with midazolam 0.1 mg/kg (max 5 mg) IV or IO administered over 2-5 minutes.

iv. Initial synchronized cardioversion:
   (a) 0.5-1 J/kg to a maximum of 50-100 J (monophasic or biphasic) for narrow regular complex tachycardia or if adult size, the energy recommended by the manufacturer.
   (b) If (a) not effective increase to 2 J/kg or maximum of 200 J monophasic or 120-200 J biphasic for narrow complex tachycardia. Follow manufacturer’s recommendations for adult sized patients.

3. Wide complex tachycardia with adequate perfusion:

a. Assess patient’s perfusion. Signs or symptoms of poor perfusion include:
   - Hypotension
   - Acutely altered mental status
   - Signs of shock
   - Ischemic chest discomfort
   - Acute heart failure
   - History of congenital heart disease
   - History of arrhythmia

b. Antiarrhythmic medications that are indicated for wide complex tachycardia are amiodarone, lidocaine, and adenosine. The choice of antiarrhythmic to be administered and whether or not administration requires online medical direction should be predetermined by the medical director for your organization. Please follow these guidelines for the administration.

i. Amiodarone 5 mg/kg to maximum of 300 mg IV over 20-60 minutes
   NOTE: If the patient’s condition is unchanged ten minutes after the first dose, a second dose of amiodarone may be given, 5 mg/kg to a maximum of 150 mg over 20-60 minutes.
   a) Do not give amiodarone to patients with prolonged QT intervals (> 500 milliseconds).
   b) Do not give amiodarone with other antiarrhythmic medications including procainamide and lidocaine.

ii. Lidocaine 1 mg/kg IVP
   May repeat the dose every 5 minutes to a maximum dose of 3 doses IV/IO push
ARRHYTHMIAS (Continued)

iii. Adenosine 0.1 mg/kg or maximum dose of 6 mg rapid IV/IO push followed by a 10 mL NS flush
   a) Only if wide complex rhythm is regular
   b) **Do not administer adenosine for irregular wide complex tachycardias**
   c) If monomorphic regular tachycardia continues, give adenosine 0.2 mg/kg to a maximum dose of 12 mg rapid IV/IO push, followed rapidly by 10 mL NS flush

**NOTE:** If at any time the patient becomes unstable and/or has poor perfusion, go directly to synchronized cardioversion.

**NOTE:** Do not administer more than one antiarrhythmic simultaneously to a patient. The choice of the antiarrhythmic to be administered should be predetermined by the medical director for your organization.

iv. Prior to synchronized cardioversion, consider sedation with midazolam 0.1 mg/kg (max 5 mg) IV/IO administered over 2-5 minutes.

v. Initial synchronized cardioversion:
   0.5-1 J/kg to a maximum of 50-100 J (monophasic or biphasic) for wide complex tachycardia. Or for adult sized patients at the energy recommended by the manufacturer.

**NOTE:** Wide irregular complexes are not typically associated with a stable patient with normal perfusion. Contact medical direction for advice on these rare cases.

4. Wide complex tachycardia with poor perfusion:
   a. Prepare for immediate synchronized cardioversion
      i. Consider sedation with midazolam 0.1 mg/kg (max 5 mg) IV/IO administered over 2-5 minutes.
   b. Synchronized cardioversion:
      i. 2 J/kg or maximum of 100 J (monophasic or biphasic) for wide regular complexes or at the energy recommended by the manufacturer. Increase to 4 J/kg if not effective.
      ii. Defibrillation with high-energy (or 4 J/kg) (unsynchronized) shocks for ventricular fibrillation or irregular wide complex tachycardia in which defibrillator is unable to synchronize.
   c. Administer an antiarrhythmic. Antiarrhythmic medications that are indicated for a wide complex tachycardia are amiodarone, procainamide, or lidocaine. The choice of the antiarrhythmic to be administered should be predetermined by the medical director for your organization. Please follow these guidelines for the administration:
      i. Amiodarone 5 mg/kg or maximum dose of 300 mg IV over 20-60 minutes
         a) If the patient’s condition is unchanged ten minutes after the first dose, a second dose of amiodarone may be given, 5 mg/kg (maximum 150 mg) IV/IO over 20-60 minutes
      ii. Lidocaine 1 mg/kg IVP
         (a) May repeat the dose every 5 minutes to a maximum dose of 3 doses IV/IO push

**NOTE:** Do not administer more than one antiarrhythmic simultaneously to a patient. The choice of the antiarrhythmic to be administered should be predetermined by the medical director for your organization.

d. Repeat synchronized cardioversion if the patient has a pulse and ongoing poor perfusion.
ARRHYTHMIAS

EMT

AEMT

PARAMEDIC

Open and manage airway and provide 100% O2 with NRB mask. Assess vital signs including pulse oximetry

Evaluate signs and symptoms and SAMPLE history

EMT with an AEMT may obtain a rhythm strip for interpretation at the hospital

Contact medical control and transport unless ALS is quickly available

Assume charge of scene and apply cardiac monitor to interpret rhythm

Start IV

Treat arrhythmia

Bradycardia

Assess perfusion

For poor perfusion and heart rate less than 60, start CPR

For good perfusion, transport. If evidence of heart block prepare to need external pacing

Administer epinephrine and transport

Administer atropine and if no improvement external pacing

Narrow complex tachycardia

Assess perfusion

For poor perfusion, contact medical control to discuss sedation and synchronized cardioversion. Transport

For good perfusion, contact medical control to consider amiodarone, lidocaine, or adenosine and transport

Wide complex tachycardia

Assess perfusion

For poor perfusion, contact medical control to discuss sedation and synchronized cardioversion. Transport
BURNS

GENERAL INFORMATION

A. The first priority is to assure scene safety and then remove the patient from heat and flame, electrical, or chemical exposure.

B. Airway, breathing, and circulation must be stabilized before attending to the burn.

C. Patient with extensive burns must be monitored for hypothermia and the use of ice and/or prolonged cold compresses should be avoided. When in doubt, always cover with dry dressing.

D. In caring for the burn, the EMS professional should:
   1. Stop the burning
   2. Reduce the pain
   3. Prevent contamination

E. Patients with critical burns must be transported per local protocol.

F. When dealing with contaminated environments, EMS professionals must have appropriate protective clothing. If not available, contact appropriate hazardous materials (HAZMAT) service for such equipment.

G. Gross decontamination must be done at the scene. Advise receiving facility if complete decontamination was not done at the scene, and be prepared to transport to decontamination area.

EMT

A. Open and manage airway and provide oxygen as appropriate.

B. Determine type of burn and treat as follows:
   1. Thermal (dry and moist):
      a. Stop burning process: i.e. remove patient from heat source, cool skin (but do not freeze it), remove clothing.
      b. If patient starts to shiver or skin is cool, stop cooling process.
      c. Estimate extent (% of total body surface area) and depth of burn (see chart).
      d. Cover burn areas with sterile dressing
   2. Radiation Burns:
      a. Treat as thermal burns except when the burn is contaminated with a radioactive source. If contaminated with radioactive material, treat as chemical burn.
      b. Wear appropriate protective clothing when dealing with contamination.
      c. Contact HAZMAT team for assistance in contamination cases.
BURNS (Continued)

3. **Chemical Burns:**
   a. EMS professionals must wear appropriate protective clothing and respirators.
   b. Remove patient from contaminated area and move the patient to the decontamination site *(Do not move the patient directly into the squad).*
   c. Determine chemicals involved; contact appropriate agency for chemical information.
   d. Remove patient's clothing and flush skin.
   e. Leave contaminated clothes at scene. Cover patient over and under before loading into squad.
   f. Patient should be transported by personnel not involved in decontamination process.
   g. Determine severity (see chart), contact medical direction and transport accordingly.
   h. Relay type of substance involved to medical direction.

4. **Electrical Burns**
   a. Shut down electrical source; do not attempt to remove patient until electricity is confirmed to be completely turned off.
   b. Assess for visible entrance and exit wounds and treat as thermal burns.
   c. Assess for internal injury, i.e., vascular damage, tissue damage, fractures, and treat accordingly.
   d. Determine severity of burn, contact medical direction and transport accordingly.

5. **Inhalation Burns:**
   a. Always suspect inhalation burns when the patient is found in closed smoky environment and/or exhibits any of the following: burns to face/neck, singed nasal hairs, cough and/or stridor, soot in sputum.
   b. Provide oxygen therapy, contact medical direction and transport accordingly.

C. Contact medical control and transport accordingly.

**AEMT**

A. Assist EMS professional with airway. Intubate if necessary.
B. Assist in determining type of burn and its treatment.
C. For hypovolemia, start IV per shock guideline.

**PARAMEDIC**

A. Assume charge and confer with EMS professionals about patient condition and circumstances.
B. Apply cardiac monitor and treat arrhythmia, especially with electrical burns.
C. Provide endotracheal intubation per the endotracheal intubation guideline if clinically indicated.
D. Consider pain relief per local protocol.

**DO NOT DELAY TRANSPORT FOR IV PLACEMENT**
BURNS (Continued)

RULE OF NINES

NOTE: 1% is equal to the surface of the palm of the patient's hand. If unsure of %, describe injured area.

SERIOUSNESS OF BURNS

MINOR
1st degree < 70%
2nd degree < 10%
*3rd degree < 2%

MODERATE
1st degree > 70%
*2nd degree 10-30%

CRITICAL
2nd degree > 30%
3rd degree > 2%
Any burns with trauma.
Any burns with involvement of head, face, hands, feet, or genitalia

*Only if face, hands, feet or genitalia are not involved.
Assess and manage airway and breathing. Assess vital signs including pulse oximetry

Obtain SAMPLE history

Determine type and extent of burn and decontaminate or remove the cause if applicable

Surface burns should be covered with clean dry dressings

Inhalation burns require attention to the airway, breathing and 100% O2

Contact medical control and transport

Assist with airway evaluation and consider advanced airway if appropriate. Start IV for concerns of shock but do not let it delay transport

Apply cardiac monitor

Evaluate and treat any arrhythmias

Consider providing pain relief and transport
PEDIATRIC CARDIAC ARREST

GENERAL CONSIDERATIONS

A. Cardiac arrest in children is primarily due to lack of an adequate airway, resulting in hypoxia.

B. All EMS professionals must concentrate on opening and maintaining the airway and providing 100% oxygen.

C. Passive ventilation: High flow oxygen is applied via a non-rebreather mask with an oropharyngeal airway. Some oxygen will be entrained with each decompression of the chest. This may be applied for the first 3-4 compression cycles (6-8 minutes), after which one may consider BVM ventilation or placement of an advanced airway.

D. Quality CPR consists of pushing hard with compression of the chest to ≥ 1/3 of the anteroposterior diameter of the chest recommended depth for infant 1.5 inches (4 cm), and compressions of 100 to 120 per minute, and allowing complete chest recoil. In children who have reached puberty, i.e. adolescents, the recommended adult compression depth of 2 inches (5 cm) to 2.4 inches (6 cm) should be used.

E. For two-person CPR, the rate of chest compressions without the presence of an advanced airway is 3:1 in newborns with a suspected primary etiology of respiratory compromise, and 15:2 in children and newborns in arrest with a suspected cardiac etiology. If an advanced airway is in place, 12-20 breaths per minute (1 breath every 3-5 seconds) should be administered with continuous chest compressions.

F. Pulseless patients or those with a weak or slow pulse following a known or suspected opioid overdose should be managed as cardiac arrest patients. Standard resuscitative measures should be initiated immediately and should take priority over naloxone administration or waiting for a response from previously administered naloxone.

G. During BVM ventilation or endotracheal intubation, routine cricoid pressure to prevent aspiration is no longer recommended.

H. Transport immediately when excessive hemorrhage or hypothermia is present. ALS measures should be carried out during transport.

I. If peripheral IVs cannot be established, venous access should be obtained by the intraosseous route.

J. If IV or IO access cannot be established, administer appropriate medications through the ET tube.

NOTE: AEDs should not be used on patients under one year of age. Pediatric AED pads are preferred for patients between the ages of 1 and 8 years. Adult AED pads should be used for patients greater than 8 years of age, but they may be used in patients between the ages of 1 and 8 years of age if pediatric AED pads are unavailable. Shocks should be delivered as soon as device is ready if indicated.

K. If Sudden Infant Death Syndrome (SIDS) is suspected:
   1. Initiate basic and advanced life support, unless apparent rigor mortis or signs of lividity are present.
   2. Communicate with and reassure the parents.
   3. Encourage family to have friends or neighbors accompany them to the hospital.
   4. If infant is not resuscitated, refer parents to social services at the nearest appropriate emergency department to initiate counseling.

L. Refer to BROSELOW® PEDIATRIC EMERGENCY TAPE when unsure about patient weight, age and/or drug dosage.
EMT

A. Open and maintain airway in sniffing position.
B. Consider passive ventilations.
C. Ventilate with 100% oxygen via BVM with oxygen reservoir.
D. Initiate quality CPR in accordance with American Heart Association guidelines.
E. Establish communications with medical control and advise of patient condition. Transport IMMEDIATELY unless ALS unit is en route and has an ETA of less than 5 minutes.
F. If an Automated External Defibrillator (AED) is available:
   1. Assess patient for respirations and cardiac arrest.
   2. Apply AED and activate the device.
   3. Start documentation that must include:
      - EMS unit delivering care and ID of EMS professionals
      - Initial call information (i.e. accidental ingestion, drowning, etc.)
      - Initial patient assessment, findings, and impression
      - Care given to this point
      - Ongoing outcomes of care delivered to patient

      a. “No Shock Advised”
         i. Continue quality CPR for two minutes.
         ii. Continue ventilation with 100% oxygen via BVM with oxygen reservoir.
         iii. Contact medical control and transport immediately.
      b. “Shock Advised”
         i. Deliver a single shock.
         ii. Resume quality CPR for two minutes.
         iii. Contact medical control, advise of cardiac arrest, and transport immediately.
   c. After each two-minute cycle of quality CPR, activate AED to assess rhythm and deliver a single shock if indicated.
   d. Resume quality CPR.

TURN AED OFF DURING PATIENT MOVEMENT

AEMT

A. Assume charge and confer with EMS professionals to patient condition and circumstances.
B. Apply cardiac monitor.
C. If monitor shows ventricular fibrillation or pulseless ventricular tachycardia:
   1. Defibrillate at 2 joules/kg (round up)
   2. Five cycles (2 minutes) of quality CPR.
   3. If no response, defibrillate at 4 joules/kg (round up)
   4. Resume quality CPR and TRANSPORT.
D. Start IV or IO of saline and give 20 mL/kg NS IV bolus. IV access should be accomplished en route to hospital.
PARAMEDIC

A. Assume charge and confer with EMS professionals as to patient condition and circumstances.

B. If an AEMT is in a cycle of defibrillation, allow to complete cycle.

C. Assess airway and intubate if needed.

D. Establish IV or IO, whichever is quickest.

E. Apply monitor. If one of the following conditions exists, treat as follows:

1. Ventricular fibrillation or pulseless ventricular tachycardia.
   a. Defibrillate at 2 joules/kg (round up)
   b. If no response, quality CPR for 2 minutes.
   c. Defibrillate at 4 joules/kg (round up) (maximum of 360J for monophasic devices).
   d. If no response, continue quality CPR for 2 minutes.
   e. Administer monitor.
      • IV / IO doses – 0.01 mg/kg of 0.1 mg/mL (0.1 mL/kg), maximum 1 mg
      f. If no response, defibrillate at ≥ 4 joules/kg to a maximum of 10 joules/kg or the adult dose.
      g. If no response, continue quality CPR for 2 minutes.
      h. Administer one antiarrhythmic:
         • Amiodarone 5 mg/kg IV/IO (maximum dose of 300 mg), may repeat dose (maximum of 150 mg IV/IO) up to 2 times for refractory ventricular fibrillation or pulseless ventricular tachycardia or
         • Lidocaine 1 mg/kg IV/IO push.
      i. If no response, continue quality CPR and TRANSPORT.
      j. Consider the treatment of reversible causes.
         • Hypovolemia: administer 20 mL/kg NS IV fluid boluses
         • Hypoxia
         • Hydrogen ion (acidosis)
         • Hypoglycemia: administer 2 mL/kg of D25W IV/IO for children under 20 kg or 1 mL/kg (maximum 50 mL) of D50 IV/IO for children over 20 kg if the blood glucose is less than 60 mg/dL
         • Hypokalemia/hyperkalemia
         • Hypothermia
         • Tension pneumothorax
         • Tamponade, cardiac
         • Toxins
         • Thrombosis, pulmonary
         • Thrombosis, coronary

2. Asystole / Pulseless Electrical Activity (PEA):
   a. Begin quality CPR immediately
   b. Obtain IV/IO access
   c. Continue quality CPR for two minutes and administer epinephrine IV/IO every 3-5 minutes
   d. IV/IO doses: 0.01 mg/kg of 0.1 mg/mL (0.1 mL/kg), maximum 1 mg
   e. Confirm asystole in two different leads
   f. If rhythm is unclear and possibly ventricular fibrillation, follow ventricular fibrillation/pulseless ventricular tachycardia guideline
g. Consider treatable causes:
   - Hypovolemia: administer 20 mL/kg NS IV boluses
   - Hypoxia
   - Hydrogen ion (acidosis)
   - Hypoglycemia: administer 2 mL/kg of D25W IV/IO for children under 20 kg or 1 mL/kg (maximum 50 mL) of D50 IV/IO for children over 20 kg if the blood glucose is less than 60 mg/dL
   - Hypokalemia/hyperkalemia
   - Hypothermia
   - Tension Pneumothorax
   - Tamponade, cardiac
   - Toxins
   - Thrombosis, pulmonary
   - Thrombosis, coronary
h. If no response, continue quality CPR and transport.
PEDIATRIC CARDIAC ARREST

EMT  AEMT  PARAMEDIC

Open and maintain airway in sniffing position. Ventilate with 100% O2 using BVM

Begin CPR in accordance with AHA guidelines

Contact medical control and transport unless ALS is quickly available

If an AED is available, apply the device and follow instructions

Apply cardiac monitor

If ventricular fibrillation or pulseless ventricular tachycardia, defibrillate, provide 2 minutes of CPR, defibrillate, resume CPR and transport

Start IO and administer a bolus of isotonic saline rapidly, on the way to the hospital

Reassess airway and consider advanced airway. Confirm vascular access and administer IV/IO epinephrine every 3-5 minutes.

Continue 2 minute cycles of CPR between pulse checks and rhythm reassessments and appropriate defibrillation attempts

If no response, administer amiodarone or lidocaine and continue CPR

Consider treatable causes of cardiac arrest: hypovolemia, hypoxia, acidosis, hypoglycemia, hypothermia, pneumothorax, toxins and electrolyte abnormalities

Continue CPR in accordance with AHA guidelines and transport if not already en route
NEWBORN RESUSCITATION

GENERAL CONSIDERATIONS

A. Hypothermia is common in newborns and worsens outcomes of nearly all post-natal complications
   1. Ensure heat retention by drying the infant thoroughly, covering the head, and wrapping the baby in dry cloth
   2. When it does not encumber necessary assessment or required interventions, “kangaroo care” (i.e. placing the infant skin-to-skin directly against mother’s chest and wrapping them together) is an effective warming technique
   3. Newborn infants are prone to hypothermia which may lead to hypoglycemia, hypoxia and lethargy. Aggressive warming techniques should be initiated including drying, swaddling, and warm blankets covering body and head. Check blood glucose and follow hypoglycemia guidelines as appropriate.

B. During transport, neonate should be appropriately secured in seat or isolette and mother should be appropriately secured

C. Approximately 10% of newly born infants require some assistance to begin breathing

D. Deliveries complicated by maternal bleeding (placenta previa, vas previa, or placental abruption) place the infant at risk for hypovolemia secondary to blood loss

E. Low birth weight infants are at high risk for hypothermia due to heat loss

F. If pulse oximetry is used as an adjunct, the preferred placement place of the probe is the right arm, preferably wrist or medial surface of the palm. Normalization of blood oxygen levels (SaO₂ 85-95%) will not be achieved until approximately 10 minutes following birth

G. Both hypoxia and excess oxygen administration can result in harm to the infant. If prolonged oxygen use is required, titrate to maintain an oxygen saturation of 85-95%

H. While not ideal, a larger facemask than indicated for patient size may be used to provide bag-valve-mask ventilation if an appropriately sized mask is not available - avoid pressure over the eyes as this may result in bradycardia

I. Increase in heart rate is the most reliable indicator of effective resuscitative efforts

J. A multiple gestation delivery may require additional resources and/or providers

K. There is no evidence to support the routine practice of administering sodium bicarbonate for the resuscitation of newborns

EMT

A. History
   1. Date and time of birth
   2. Onset of symptoms
   3. Prenatal history (prenatal care, substance abuse, multiple gestation, maternal illness)
   4. Birth history (maternal fever, presence of meconium, prolapsed or nuchal cord, maternal bleeding)
   5. Estimated gestational age (may be based on last menstrual period)

B. Exam
   1. Respiratory rate and effort (strong, weak, or absent; regular or irregular)
   2. Signs of respiratory distress (grunting, nasal flaring, retractions, gasping, apnea)
   3. Heart rate (fast, slow, or absent)
      i. Precordium, umbilical stump or brachial pulse may be used
      ii. Auscultation of chest is preferred since palpation of umbilical stump is less accurate
NEWBORN RESUSCITATION (cont’d)

4. Muscle tone (poor or strong)
5. Color/Appearance (central cyanosis, acrocyanosis, pallor, normal)
6. APGAR score (appearance, pulse, grimace, activity, respiratory effort) - may be calculated for documentation, but not necessary to guide resuscitative efforts
7. Estimated gestational age (term, late preterm, premature)
8. Pulse oximetry should be considered if prolonged resuscitative efforts or if supplemental oxygen is administered - goal: oxygen saturation at 10 minutes is 85-95%

C. Treatment
1. If immediate resuscitation is required and the newborn is still attached to the mother, clamp the cord in two places and cut between the clamps. If no resuscitation is required, warm/dry/stimulate the newborn and then cut/clamp the cord after 60 seconds or the cord stops pulsating
2. Warm, dry, and stimulate
   a. Wrap infant in dry towel or thermal blanket to keep infant as warm as possible during resuscitation; keep head covered if possible
   b. If strong cry, regular respiratory effort, good tone, and term gestation, infant should be placed skin-to-skin with mother and covered with dry linen
3. If weak cry, signs of respiratory distress, poor tone, or preterm gestation then position airway (sniffing position) and clear airway as needed - if thick meconium or secretions present and signs of respiratory distress, suction mouth then nose
4. If heart rate greater than 100 beats per minute
   a. Monitor for central cyanosis - provide blow-by oxygen as needed
   b. Monitor for signs of respiratory distress. If apneic or in significant respiratory distress:
      i. Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute
5. If heart rate less than 100 beats per minute
   a. Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute
      i. Primary indicator of effective ventilation is improvement in heart rate
      ii. Rates and volumes of ventilation required can be variable, only use the minimum necessary rate and volume to achieve chest rise and a change in heart rate
   b. If no improvement after 90 seconds, change oxygen delivery to 30% FiO2 if blender available, otherwise 100% FiO2 until heart rate normalizes
6. If heart rate less than 60 beats per minute
   a. Ensure effective ventilations with supplementary oxygen and adequate chest rise
   b. If no improvement after 30 seconds, initiate chest compressions - two-thumb-encircling-hands technique is preferred
   c. Coordinate chest compressions with positive pressure ventilation (3:1 ratio, 90 compressions and 30 breaths per minute)

AEMT/ PARAMEDIC

d. Consider endotracheal intubation per local guidelines

e. Administer epinephrine (0.1 mg/mL) 0.01 mg/kg IV/IO (preferable if access obtained) or 0.1 mg/kg via the ETT using 1 mg/mL concentration (if unable to obtain access)
7. Consider checking a blood glucose for ongoing resuscitation, maternal history of diabetes, ill appearing or unable to feed
8. Administer 10 mL/kg normal saline bolus IV/IO for signs of shock or post-resuscitative care

<table>
<thead>
<tr>
<th>APGAR SCORE</th>
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<tbody>
<tr>
<td>Sign</td>
</tr>
<tr>
<td>Color</td>
</tr>
<tr>
<td>Heart Rate</td>
</tr>
<tr>
<td>Irritability (response to stimulation)</td>
</tr>
<tr>
<td>Muscle Tone</td>
</tr>
<tr>
<td>Respiratory Effort</td>
</tr>
</tbody>
</table>
EMT

A. General Considerations

1. An event in an infant less than 1 year old reported by a bystander as sudden, brief (less than 1 min), *completely resolved upon EMS arrival* that includes one or more of the following:
   a. Absent, decreased, or irregular breathing
   b. Color change (central cyanosis or pallor)
   c. Marked change in muscle tone (hyper- or hypotonia)
   d. Altered level of responsiveness

2. BRUE is a group of symptoms, not a disease process.

3. All patients should be transported to an ED

4. Contact medical control if parent/guardian is refusing medical care and/or transport, especially if any high-risk criteria are present: less than 2 months of age, history of prematurity, & more than 1 BRUE, now or in the past.

B. Evaluate

1. Vital signs
2. Signs of respiratory distress (grunting, nasal flaring, retracting)
3. Color (pallor, cyanosis, normal)
4. Mental status (alert, tired, lethargic, unresponsive, irritability)
5. Head to toe exam, including:
   a. Physical exam for signs of trauma or neglect
   b. Pupillary response

C. History

1. History of circumstances and symptoms before, during, and after the event, including duration, interventions done, and patient color, tone, breathing, feeding, position, location, activity, level of consciousness.
2. Other concurrent symptoms (fever, congestion, cough, rhinorrhea, vomiting, diarrhea, rash, labored breathing, fussy, less active, poor sleep, poor feeding).
3. Prior history of BRUE.
4. Past medical history (prematurity, prenatal/birth complications, gastric reflux, congenital heart disease, developmental delay, airway abnormalities, breathing problems, prior hospitalizations, surgeries, or injuries).
5. Family history of sudden unexplained death or cardiac arrhythmia in other children or young adults.
6. Social history: who lives at home, recent household stressors, exposure to toxins/drugs, sick contacts.
7. Considerations for possible child abuse (multiple/changing versions of the story; reported mechanism of injury does not seem plausible, especially for child’s developmental stage).

D. Management

1. Monitoring
   a. Continuous pulse oximetry
   b. Check blood glucose if altered mental status and treat per Altered Mental Status guideline
   c. Serial observations during transport for change in condition
BRIEF RESOLVED UNEXPLAINED EVENT (BRUE) (Continued)

2. Airway
   a. Give supplemental oxygen via non-rebreather for signs of respiratory distress or hypoxemia.
   b. Suction the nose and/or mouth (via bulb, suction catheter) if excessive secretions are present.

3. Breathing
   a. Support respirations with bag value mask if ineffectively ventilating and oxygenating.

AEMT/ PARAMEDIC

1. Assist EMS professional, obtain patient condition and circumstance.
2. Apply cardiac monitor and check rhythm.
3. IV placement and fluids:
   a. Routine IVs should not be placed in all BRUE patients.
   b. IVs should only be placed in children for clinical concerns of shock, or when administering IV medications.
PEDIATRIC PAIN MANAGEMENT

GENERAL CONSIDERATIONS

A. The practice of prehospital emergency medicine requires expertise in a wide variety of pharmacological and non-pharmacological techniques to treat acute pain resulting from myriad injuries and illnesses. Approaches to pain relief must be designed to be safe and effective in the dynamic prehospital environment. The degree of pain and the hemodynamic status of the patient will determine the urgency and extent of analgesic interventions.

B. All patients should have drug allergies identified prior to administration of pain medication.

C. Administer opioids with caution to patients with GCS less than 15, hypotension, identified medication allergy, hypoxia (oxygen saturation less than 90%) after maximal supplemental oxygen therapy, signs of hypoventilation, or multi-system trauma.

D. Avoid non-steroidal anti-inflammatory medications such as ketorolac in patients with NSAID allergy, aspirin-sensitive asthma, renal insufficiency, pregnancy, or known peptic ulcer disease.

E. Ketorolac should not be used in patients with hypotension (due to renal toxicity).

F. Use of splinting techniques and application of ice should be done to reduce the total amount of medication used to keep the patient comfortable.

EMT

A. Determine patient’s pain score assessment using standard pain scale.
   1. Less than 4 years old: Observational scale (e.g. Faces, Legs, Arms, Cry, Consolably [FLACC] or Children’s Hospital of Eastern Ontario Pain Scale (CHEOPS)
   2. 4-12 years old: Self-report scale (e.g. Wong Baker Faces, Faces Pain Scale [FPS], Faces Pain Scale Revised [FPS-R])
   3. Greater than 12 years old: Self-report scale (Numeric Rating Scale [NRS])

B. If available, consider use of non-pharmaceutical pain management techniques.
   1. Placement of the patient in a position of comfort (including in parents/guardians lap).
   2. Application of ice packs and/or splints for pain secondary to trauma.
   3. Verbal reassurance to control anxiety.
   4. Distraction techniques.

AEMT/ PARAMEDIC

A. Apply a cardiac monitor and pulse oximetry if indicated based upon patient assessment.
   1. If not improved and patient is experiencing moderate discomfort consider use of analgesics as available and as permitted by medical oversight.
      a. Acetaminophen 15 mg/kg PO (maximum dose 1000 mg). Acetaminophen has an opioid-sparing effect.
      b. Ibuprofen 10 mg/kg PO for patients greater than 6 months of age (maximum dose 800 mg)
      c. Fentanyl 1.5 mcg/kg IN or 1 mcg/kg IM (maximum initial dose of 100 mcg)
      d. Ketorolac (one-time dose only): 1 mg/kg IM (maximum dose 30 mg)
      e. Morphine sulfate: 0.1 mg/kg IM (maximum initial dose 5 mg)
2. Establish IV of normal saline per patient assessment.
3. If the patient is experiencing **severe to excruciating** pain, administer analgesics as available and as permitted by medical oversight.
   a. Ketorolac (one-time dose only): 0.5 mg/kg IV (maximum dose 15 mg) over 1 minute
   b. Morphine sulfate: 0.1 mg/kg IV or IO (maximum initial dose 5 mg) over at least 3 minutes
   c. Fentanyl: 1 mcg/kg IV or IO (maximum initial dose 100 mcg) over at least 3 minutes to prevent rigid chest
4. Consider administration of oral, sublingual, or IV antiemetics to prevent nausea in high risk patients.
5. If indicated based on pain assessment, and vital signs allow, repeat pain medication administration (excluding ketorolac) after 15 minutes of the previous dose.
6. Transport in position of comfort and reassess as indicated.

![Non-verbal Pain Scale](image)

**Universal Pain Assessment Tool**

<table>
<thead>
<tr>
<th>Verbal Descriptor Scale</th>
<th>No Pain</th>
<th>Mild Pain</th>
<th>Moderate Pain</th>
<th>Severe Pain</th>
<th>Very Severe Pain</th>
<th>Excruciating Pain</th>
</tr>
</thead>
</table>

The Wong-Baker FACES® Foundation requires permission to allow others to use or reproduce their pain rating scale. Although we are citing it as a resource, if you wish to use the Scale in your guidelines/protocols publication, please go to [www.wongbakerfaces.org](http://www.wongbakerfaces.org) where you will find instructions on the use of this diagram.

<table>
<thead>
<tr>
<th>Descriptive Scale</th>
<th>Alert</th>
<th>Smiling</th>
<th>No Humor Serious, Flat</th>
<th>Furrowed Brow</th>
<th>Pursed Lips</th>
<th>Breath Holding</th>
<th>Wrinkled Nose</th>
<th>Raised Upper Lip</th>
<th>Rapid Breathing</th>
<th>Slow Blink</th>
<th>Open Mouth</th>
<th>Eyes Closed</th>
<th>Moaning</th>
<th>Crying</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Activity Tolerance Scale</th>
<th>No Pain</th>
<th>Can be Ignored</th>
<th>Interferes with Tasks</th>
<th>Interferes with Concentration</th>
<th>Interferes with Basic Needs</th>
<th>Bed Rest Required</th>
<th>Un Dolor Insoportable</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Spanish</th>
<th>Nada de Dolor</th>
<th>Un Poquito de Dolor</th>
<th>Un Dolor Leve</th>
<th>Dolor Fuerte</th>
<th>Dolor Desmasiado Fuerte</th>
<th>Bed Rest Required</th>
<th>Un Dolor Insoportable</th>
</tr>
</thead>
</table>

**Source:** Hybrid of scales by authors. Reproduction of the Wong-Baker FACES® material requires licensing at [www.wongbakerfaces.org](http://www.wongbakerfaces.org).
**Faces, Legs, Activity, Cry, Consolability (FLACC) Behavioral Scale**

Appropriate age for use (per guideline): less than 4 years

<table>
<thead>
<tr>
<th>Categories</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td><strong>Face</strong></td>
<td>No particular expression or smile</td>
</tr>
<tr>
<td><strong>Legs</strong></td>
<td>Normal position or relaxed</td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td>Lying quietly, normal position, moves easily</td>
</tr>
<tr>
<td><strong>Cry</strong></td>
<td>No cry (awake or asleep)</td>
</tr>
<tr>
<td><strong>Consolability</strong></td>
<td>Content, relaxed</td>
</tr>
</tbody>
</table>

Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0-2, which results in a total score between zero and ten.

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**Instructions:**

1. **Patients who are awake:** Observe for at least 1-2 minutes. Observe legs and body uncovered. Reposition patient or observe activity, assess body for tenseness and tone. Initiate consoling interventions if needed
2. **Patients who are asleep:** Observe for at least 2 minutes or longer. Observe body and legs uncovered. If possible, reposition the patient. Touch the body and assess for tenseness and tone.

**Face**

1. Score 0 point if patient has a relaxed face, eye contact and interest in surroundings
2. Score 1 point if patient has a worried look to face, with eyebrows lowered, eyes partially closed, cheeks raised, mouth pursed
3. Score 2 points if patient has deep furrows in the forehead, with closed eyes, open mouth and deep lines around nose/lips

**Legs**

1. Score 0 points if patient has usual tone and motion to limbs (legs and arms)
2. Score 1 point if patient has increase tone, rigidity, tense, intermittent flexion/extension of limbs
3. Score 2 points if patient has hyper tonicity, legs pulled tight, exaggerated flexion/extension of limbs, tremors
PEDIATRIC PAIN MANAGEMENT (Continued)

Activity
1. Score 0 points if patient moves easily and freely, normal activity/restrictions
2. Score 1 point if patient shifts positions, hesitant to move, guarding, tense torso, pressure on body part
3. Score 2 points if patient is in fixed position, rocking, side-to-side head movement, rubbing body part

Cry
1. Score 0 points if patient has no cry/moan awake or asleep
2. Score 1 point if patient has occasional moans, cries, whimpers, sighs
3. Score 2 points if patient has frequent/continuous moans, cries, grunts

Consolability
1. Score 0 points if patient is calm and does not require consoling
2. Score 1 point if patient responds to comfort by touch or talk in ½ - 1 minute
3. Score 2 points if patient require constant consoling or is inconsolable after an extended time

Whenever feasible, behavioral measurement of pain should be used in conjunction with self-report. When self-report is not possible, interpretation of pain behaviors and decision-making regarding treatment of pain requires careful consideration of the context in which the pain behaviors were observed.

Each category is scored on a 0-2 scale, which results in a total score of 0-10

Assessment of Behavioral Score:
- 0 = Relaxed and comfortable
- 1-3 = Mild discomfort
- 4-6 = Moderate pain
- 7-10 = Severe discomfort/pain

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Faces Pain Scale – Revised (FPS-R)

Diagram Removed for this Distribution Version of the Guidelines

The International Association for the Study of Pain® (IASP) has permitted NASEMSO to reproduce the Faces Pain Scale Revised (FPS-R) for the NASEMSO website PDF version of the Guidelines. However, this diagram has been removed from this distribution version of the Guidelines, because NASEMSO does not have permission to allow others to reproduce it. To obtain permission to reproduce this diagram for your guidelines/protocols, please write to: iaspdesk@iasp-pain.org
PEDiatric Pain Management

EMT

AEMT/Paramedic

Determine patient's pain score using a validated pain scoring tool appropriate for age:

Observational scale for less than 4 years old
Self-report scale using pictures for 4-12 years old
Self-report scale using #'s for 12 years old and above

Consider use of non-pharmaceutical pain management techniques and transport unless ALS is quickly available

Apply cardiac monitor and pulse oximetry if indicated based on patient assessment or if narcotics will be administered

For moderate discomfort and those not requiring an IV, consider these medications as permitted by local protocol:
acetaminophen, ibuprofen, fentanyl, ketorolac, and morphine

For severe pain, consider these IV medications as permitted by local protocol: fentanyl, ketorolac, and morphine. Transport and reassess frequently en route
PEDIATRIC POISONING

GENERAL CONSIDERATIONS
A. EMS professionals should consider the possibility of accidental or self-poisoning under the following conditions:
   1. History of observed or admitted accidental or intentional ingestion
   2. Coma
   3. History of known suicide gesture
   4. Suggestive intoxicated behavior (hyperactive, hypoactive, unstable walk, lethargic)

B. Common toxidromes and symptomatology:
   1. Anticholinergic: Red as a beet (flushed skin), hot as a pistol (fever), dry as a bone (dry skin), mad as a hatter (altered mental state), blind as a bat (mydriasis), and full as a flask (urinary retention).
   3. Opioids: respiratory depression, miosis, altered mental state, decreased bowel sounds
   4. Sympathomimetic: Tachycardia, hypertension, diaphoresis, delusional, seizures, hyperthermia, mydriasis
   5. Serotonin syndrome: Agitation, ataxia, diaphoresis, diarrhea, hyperreflexia, myoclonus, tremor/shivering, hyperthermia, tachycardia

EMT
A. Establish airway.
B. Obtain relevant history.
   1. What, when, why taken (if known)
   2. Quantity taken (if known)
   3. Victim's age and weight
C. Take whatever container the substance came from to the hospital along with readily obtainable samples of medication unless this results in an unreasonable delay of transport.
D. Evaluate the patient's:
   1. Breath sounds (rales)
   2. Level of consciousness
   3. Pupil size
   4. Evidence of head injury
E. Depending on route poison entered body apply the following:
   1. Ingested Poisons - Transport (contact medical direction for prolonged transports >30 minutes or for recommendation for charcoal administration)
   2. Inhaled Poisons
      a. Remove from toxic area
      b. Secure airway, support with 100% oxygen
      c. Assist in ventilation if necessary
PEDIATRIC POISONING (Continued)

3. Absorbed Poisons
   a. Remove victim's clothing
   b. Identify substance
   c. Flush skin with water before and during transport if possible - at least 10-15 minutes
   d. If eyes are involved flush with water or saline for 10-15 minutes

4. Injected Poisons
   a. Secure and maintain airway
   b. Find substance and introduction system, if possible
   c. For snake bites, do not suction the wound or apply constricting bands, tourniquets, or ice

AEMT

A. Assist EMS professionals, obtain patient condition and circumstance.
B. Apply monitor and check rhythm.
C. Start heplock/saline lock or IV normal saline at KVO while en route to hospital. Do not delay transport.

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation.
B. If patient has an altered mental status, follow the altered level of consciousness guideline.
C. Start heplock/saline lock or IV normal saline at KVO.
D. Contact medical control for prolonged transports anticipated to be greater than 30 minutes and to discuss if charcoal administration is recommended.
E. Specific antidotes/therapies for select toxidromes:
   1. Acetylcholinesterase exposure (e.g. pesticides, nerve agents, carbamates):
      a. Atropine (commercially available as AtroPen® in 0.25 mg (< 7 kg patients) and 0.5 mg (7-18 kg patients) dosages given IM). < 7 kg: 0.25 mg/dose, 7-18 kg: 0.5 mg/dose, >18-41 kg: 1 mg/dose, & >41 kg: 2 mg/dose. Doses of atropine may be repeated every 5-10 minutes. Do not administer more than 3 doses.
      b. Pralidoxime chloride (2-PAM) (auto-injectors contain 600 mg of pralidoxime chloride given IM). Doses of 2-PAM may be repeated every 15 minutes to a maximum total of 3 doses and a 600 mg dose is suggested in patients weighing ≥ 40 kg.
      c. Duodote® is a commercially available auto-injector containing 2.1 mg atropine and 600 mg pralidoxime chloride that is given IM for patients >41 kg
      d. Benzodiazepines should be administered if seizures are noted. See Seizure Protocol.
   2. Sympathomimetics/Stimulants (e.g. cocaine, methamphetamine, PCP, bath salts, bupropion, K2, Spice):
      a. If there is complaint of chest pain, obtain EKG and look specifically for a prolonged QTc or evidence of a STEMI.
      b. Monitor for potential arrhythmias and treat accordingly.
      c. Expect hypertension and hyperthermia. Consider benzodiazepines for critical hypertension and external cooling measures.
      d. Maintain vigilance for EMS personnel safety.
3. Opioid Overdose (e.g. fentanyl, heroin, hydrocodone, carfentanil, morphine, suboxone, methadone):
   a. Support airway with BVM and 100% O2 as needed. Consider intubation if GCS < 8.
   b. Administer naloxone 0.1 mg/kg IV/IM/IN/ETT (max dose 2 mg IV/IM/ETT or 4 mg IN) or adult dosing naloxone 0.4-2 mg IV/IM/IN/ETT (max dose 4 mg IN). Repeat doses every 2-3 minutes as necessary for symptom recurrence.
   
F. Carbon monoxide exposure:
   1. Remove patient from exposure. Carbon monoxide is odorless. Look for sources of exposures, combustion of propane or kerosene, combustion of charcoal stoves, heaters, generators, lawn mowers, and cars. Cyanide exposure can also occur with fires.
   2. Know that pulse oximetry can be falsely high since carbon monoxide competes with oxygen to bind hemoglobin. Symptoms can include nausea, fatigue, tachypnea, tachycardia, and cardiopulmonary arrest.
   3. Carbon monoxide can also affect the neurologic system causing headaches, confusion, vertigo, or seizures.
   4. Ensure EMS personnel safety by affixing a carbon monoxide detector to an equipment bag before entering a scene. If detector detects carbon monoxide, don the appropriate PPE and direct bystanders away from scene.
   5. Care goals:
      a. Ensure adequate oxygenation and ventilation. Provide 100% O2 NRB. Provide BVM if needed.
      b. The administration of 100% O2 will help displace carbon monoxide from hemoglobin and it should be provided to the patient even if pulse oximetry seems adequate.
      c. Treat any resultant hypoperfusion.
      d. Look for arrhythmias with EKG and rhythm strip.
      e. Consider transport to receiving center specializing in hyperbaric oxygen treatment if no other trauma is present.
      f. Remove patient from environmental exposure and ensure EMS personnel don PPE.
      g. Clear and maintain airway, provide 100% NRB and provide BVM to support ventilation as needed.
      h. Obtain history from family/bystanders, including symptom onset and time of exposure.
      i. Evaluate for any sign of injury, specifically head trauma.
      j. Obtain history and patient past medical history from family/bystanders.
      k. Establish communications with medical control and advise of patient’s condition. Transport.
      l. Set up cardiac monitoring, pulse oximetry, and capnography (if available).
      m. Check glucose level.
      n. Consider alerting Poison Control to aid in potential therapies and to track patient outcomes: (800) 222-1222
      o. Assist EMS professionals, obtain patient condition and circumstances, and transport.
      p. Set up cardiac monitor, pulse oximetry, and capnography (if available). Obtain temperature.
      q. If hypotensive or hypoperfused, place IV/IO and give 20 mL/kg normal saline bolus over 10 minutes. Reassess vitals.
      r. If hypoglycemic (glucose < 60 mg/dL), administer 2 mL/kg 25% dextrose (maximum 100 mL of D25W) IV and recheck glucose. May repeat dextrose bolus if mental status and hypoglycemia do not improve.
      s. If displaying seizure activity, give midazolam (Versed®) 0.1 mg/kg IV (max dose 5 mg). May repeat midazolam 0.1 mg/kg IV (max dose 5 mg) for ongoing seizure activity > 5 minutes. EMS professionals should be aware of potential respiratory compromise with continued seizures and or additive doses of midazolam. See Seizure Protocol.
PEDIATRIC POISONING (Continued)

t. Obtain EKG. Obtain vital signs every 15 minutes.
u. If patient continues to be hypotensive, continue fluid boluses (20 mL/kg normal saline bolus dose) and consider starting vasopressors if requiring > 60 mL/kg of fluid support.
v. Consider intubation if GCS < 8 and ESPECIALLY if requiring ongoing blood pressure support with fluid boluses or vasopressors or has evidence of singed nares or soot-tinged sputum.

Beta blocker overdose :

A. Beta blocking agents: atenolol (Tenormin®), metoprolol (Lopressor®, Toprol XL®), nadolol (Corgard®), propranolol (Inderal®, InnoPran®), sotalol hydrochloride (Betapace®)

B. Beta-adrenergic blocking agents: carvedilol (Coreg®), labetalol hydrochloride (Trandate®, Normodyne®)

C. Overdose symptoms: Bradycardia, hypotension, shortness of breath, weakness, altered mental state, seizures, cardiovascular collapse

D. Widened QRS similar to tricyclic antidepressant (TCA) toxicity may occur with propranolol. Acebutolol and propranolol may increase QRS duration. Sotalol may increase QTc and induce ventricular dysrhythmias.

E. Care goals :

1. Reduce GI absorption and further toxicity, especially if extended release formulation (e.g. administration of activated charcoal). Charcoal should never be used prehospitaly in patients with altered mental status or at risk for altered mental status without clear directions from a physician. Charcoal in an unprotected airway can be deadly.
2. Be prepared to protect airway as patients may rapidly decompensate.
3. Support vitals such as bradycardia and hypotension.
4. Assess respirations and perfusion.
5. Clear and maintain airway, provide 100% NRB and provide BVM to support ventilation as needed. Use a nasopharyngeal airway if needed, consider use of an oral airway (only if patient is obtunded, as a conscious patient may vomit with an oral airway in place).
6. Obtain history from family/bystanders, including symptom onset and time of exposure.
7. Secure medications ingested for transport with patient to hospital.
8. Obtain history and patient past medical history (especially pertinent cardiac history) from family/bystanders.
10. Set up cardiac monitoring, pulse oximetry, and capnography (if available).
11. Check glucose level.
12. Consider alerting Poison Control to aid in potential therapies and to track patient outcome: (800) 222-1222.
13. Assist EMS professionals, obtain patient condition and circumstances, transport.
14. Set up cardiac monitor, pulse oximetry, and capnography (if available).
15. Consider activated charcoal without sorbitol (1 g/kg) p.o. if mental status intact and patient is not having nausea/emesis. NOTE: There is a risk of aspiration if patient cannot adequately protect own airway.
16. If hypotensive or hypoperfused, place IV/IO and give 20 mL/kg normal saline bolus over 10 minutes. Reassess vitals.
17. If bradycardic and hypotensive, consider giving glucagon. Anticipate vomiting.
   a. Children > 40 kg: glucagon 5 mg IV over 1-5 minutes, can repeat in 5-10 minutes for total of 10 mg glucagon
   b. Children 25-40 kg: glucagon 1 mg IV over 1-5 minutes, can repeat every 5 minutes as necessary
   c. Children < 25 kg: glucagon 0.5 mg IV over 1-5 minutes, can repeat every 5 minutes as necessary
18. If hypoglycemic (glucose < 60 mg/dL), administer 2 mL/kg 25% dextrose (maximum 100 mL of D25W) IV and recheck glucose. May repeat dextrose bolus if mental status and hypoglycemia do not improve.
19. If displaying seizure activity, give midazolam (Versed®) 0.1 mg/kg IV (max dose 5 mg). May repeat midazolam 0.1 mg/kg IV (max dose 5 mg) for ongoing seizure activity > 5 minutes. EMS professionals should be aware of potential respiratory compromise with continued seizures and or additive doses of midazolam. See Seizure Protocol.

20. Obtain EKG. Obtain vital signs every 15 minutes.

21. Give atropine to treat bradycardia
   a. Adults: atropine 1 mg rapid IV push q 5 minutes (maximum 3 mg)
   b. Pediatrics: atropine 0.02 mg/kg rapid IV push (0.5 mg maximum) q 5 minutes (maximum total dose 1 mg)

22. Consider transcutaneous pacing if refractory bradycardia with hypotension. 
   NOTE: Transcutaneous pacing may not always capture nor correct hypotension when capture is successful.

23. If patient continues to be hypotensive, continue fluid boluses (20 mL/kg normal saline bolus dose) and consider starting vasopressors if requiring > 60 mL/kg of fluid support.

24. Consider intubation if GCS < 8 and especially if requiring ongoing blood pressure support with fluid boluses or vasopressors.

Calcium channel blocker overdose:

A. Calcium channel blocking agents: amlodipine (Norvasc®), diltiazem (Cardizem®, Tiazac®), isradipine, felodipine, nicardipine, nifedipine (Adalat CC®, Afeditab CR®, Procardia®), nisoldipine (Sular®), verapamil (Calan®, Verelan®)

B. Overdose symptoms: Bradycardia, hypotension, decreased AV nodal conduction, cardiogenic shock, hyperglycemia

C. Calcium channel blockers can cause many rhythm disturbances, from sinus bradycardia to complete heart block.

D. Care goals:
   1. Reduce GI absorption and further toxicity, especially if extended release formulation (e.g. administration of activated charcoal). Charcoal should never be used prehospitaly in patients with altered mental status or at risk for altered mental status without clear directions from a physician. Charcoal in an unprotected airway can be deadly.
   2. Be prepared to protect airway, as patients may rapidly decompensate.
   3. Support vitals such as bradycardia and hypoperfusion.
   4. Assess respirations and perfusion.
   5. Clear and maintain airway, provide 100% NRB and provide BVM to support ventilation as needed. Use a nasopharyngeal airway if needed, consider use of an oral airway (only if patient is obtunded, as a conscious patient may vomit with an oral airway in place).
   6. Obtain history from family/bystanders, including symptom onset and time of exposure.
   7. Secure medications ingested for transport with patient to hospital.
   8. Obtain history and patient past medical history (especially pertinent cardiac history) from family/bystanders.
   10. Set up cardiac monitoring, pulse oximetry, and capnography (if available).
   11. Check glucose level.
   12. Consider alerting Poison Control to aid in potential therapies and to track patient outcomes: (800) 222-1222.
   14. Set up cardiac monitor, pulse oximetry, and capnography (if available).
   15. Consider activated charcoal without sorbitol (1 g/kg) PO if mental status is intact and patient is not having nausea/emesis. NOTE: The risk of aspiration if patient cannot adequately protect own airway.
   16. If hypotensive or hypoperfused, place IV/IO and give 20 mL/kg normal saline bolus over 10 minutes. Reassess vitals.
   17. If bradycardic and hypotensive, consult Shock protocol and update medical control.
PEDIATRIC POISONING (Continued)

18. If displaying seizure activity, give midazolam (Versed®) 0.1 mg/kg IV (max dose 5 mg). May repeat midazolam 0.1 mg/kg midazolam (max dose 5 mg) for ongoing seizure activity > 5 minutes. EMS professionals should be aware of potential respiratory compromise with continued seizures and or additive doses of midazolam. See Seizure Protocol.

19. Obtain EKG. Obtain vital signs every 15 minutes.

20. Give atropine to treat bradycardia:
   a. Adults: atropine 1 mg rapid IV push q 5 minutes (maximum total dose 3 mg)
   b. Pediatrics: atropine 0.02 mg/kg rapid IV push (max dose 0.5 mg) q 5 minutes (maximum total dose 1 mg)

21. If ongoing bradycardia, consider calcium gluconate or calcium chloride:
   a. Calcium gluconate:
      i. Adult: calcium gluconate 2-6 g slow IV over 10 minutes
      ii. Pediatrics: calcium gluconate 60 mg/kg (maximum 2-6 g) IV over 10 minutes
   b. Calcium chloride: (central line or IO administration preferred due to risk of tissue damage)
      i. Adult: calcium chloride 1-2 g IV over 5-10 minutes
      ii. Pediatrics: calcium chloride 20 mg/kg (maximum 2 g) IV over 5-10 minutes

22. If patient continues to be hypotensive, continue fluid boluses (20 mL/kg normal saline bolus dose) and consider starting vasopressors if requiring > 60 mL/kg of fluid support. See Shock Protocol.

23. If continued poor perfusion or hypotension despite atropine, calcium, and vasopressors consider glucagon. Anticipate vomiting.
   a. Children > 40 kg: glucagon 5 mg IV over 1-5 minutes, can repeat in 5-10 minutes for total of 10 mg glucagon
   b. Children 25-40 kg: glucagon 1 mg IV over 1-5 minutes, can repeat every 5 minutes as necessary.
   c. Children < 25 kg: glucagon 0.5 mg IV over 1-5 minutes, can repeat every 5 minutes as necessary.

24. Consider transcutaneous pacing if refractory bradycardia with hypotension. **NOTE:** Transcutaneous pacing may not always capture nor correct hypotension when capture is successful.

25. Consider intubation if GCS < 8 and especially if requiring ongoing blood pressure support with fluid boluses or vasopressors.
PEDIATRIC POISONING

EMT → Evaluate for and address any airway and breathing issues

AEMT → Take a SAMPLE history with particular attention to what was taken, when and how much it known. Take any relevant containers to provide to hospital staff

PARAMEDIC → Re-evaluate breath sounds, respiratory effort, level of consciousness, pupil size and for any evidence of trauma

Poisons may be ingested, inhaled, absorbed, or injected. Protect yourself and remove the offending agent if it was inhaled or absorbed and still in contact with the patient. Transport unless ALS is quickly available

Apply monitor and assess and address rhythm abnormalities: Start IV but do not delay transport

Re-evaluate airway, breathing, presence of shock and mental status. Address abnormalities and if altered mental status follow applicable protocol. Start IV if not already done so

Contact medical control to discuss possible therapeutics particularly for transports greater than 30 minutes. Transport

Evaluations/therapeutics for common poisonings:
1. Opioid overdose: support airway and breathing, naloxone, may need to repeat naloxone
2. Carbon monoxide: remove patient from environment, 100% O2 with NRB mask, BVM if respiratory insufficiency

Evaluations/therapeutics for common poisonings:
1. Acetylcholinesterase exposure: benzo diazepine for seizures
2. Sympathomimetics: EKG and monitor for arrhythmias
3. Carbon monoxide: remove patient from environment, 100% O2 with NRB mask, BVM if respiratory insufficiency, EKG, treat hypotension with isotonic IV fluids, check glucose and treat hypoglycemia, treat seizures with benzodiazipines
4. Beta blocker overdose: glucagon (regardless of hypoglycemia), isotonic IV fluids for hypotension, dextrose for hypoglycemia, benzodiazipines for seizures, EKG
5. Calcium channel blocker overdose: dextrose for hypoglycemia, isotonic IV fluids for hypotension, EKG, benzodiazipines for seizures, glucagon

Evaluations/therapeutics for common poisonings:
1. Acetylcholinesterase exposure: atropine, 2-PAM
2. Beta blocker overdose: atropine for bradycardia
3. Calcium channel blocker overdose: atropine for bradycardia, calcium, vasopressors
AGITATED OR VIOLENT PATIENTS/BEHAVIORAL EMERGENCIES

EMT

A. General Considerations
   1. Maximize and maintain safety for the patient, EMS personnel, and others.
   2. Applies to patients who are exhibiting agitated, violent, or uncooperative behavior or who are a danger to self or others.
   3. Medical control should be contacted at any time for advice, especially when patient’s level of agitation is such that transport may place all parties at risk.
   4. Transport by air is not advised.
   5. Stretchers with adequate foam padding, particularly around the head, facilitates patient’s ability to self-position the head and neck to maintain airway patency.
   6. For patients with key-locking devices, applied by another agency, consider the following options:
      a. Remove device and replace it with a device that does not require a key
      b. Administer pharmacologic management medication then remove and replace device with another non-key-locking device after patient has become more cooperative
      c. Transport patient, accompanied in patient compartment by person who has device key
      d. Transport patient in vehicle of person with device key if medical condition of patient is deemed stable, direct medical oversight so authorizes, and law allows

B. Evaluate
   1. Note medications/substances on scene that may contribute to the agitation, or may be relevant to the treatment of a contributing medical condition.
   2. Assess and support airway if necessary.
   3. Note respiratory rate and effort.
   4. Assess circulatory status:
      a. Blood pressure (if possible)
      b. Pulse rate
      c. Capillary refill
   5. Assess mental status.
   6. Check blood glucose (if possible).
   7. Obtain temperature (if possible).
   9. Use a validated risk assessment tool such as RASS (Richmond Agitation Sedation Score), AMSS (Altered Mental Status Score), or BARS (Behavioral Activity Rating Scale) to risk stratify violent patients to help guide interventions.

C. Establish patient rapport
   1. Attempt verbal reassurance and calm patient prior to use of pharmacologic and/or physical management devices.
   2. Engage family members/loved ones to encourage patient cooperation if their presence does not exacerbate the patient’s agitation.
   3. Continued verbal reassurance and calming of patient following use of chemical/physical management devices.

AEMT/ PARAMEDIC

A. Pharmacologic management
   1. Selection of medications for pharmacologic management should be based upon the patient’s clinical condition, current medications, and allergies in addition to EMS resources and medical oversight.
AGITATED OR VIOLENT PATIENT/BEHAVIORAL EMERGENCIES (Continued)

2. The medications are annotated to indicate when they are preferred for patients that are particularly high risk for violence as assessed by a validated scale – note that the dosing can be adjusted to achieve different levels of sedation.
   a. Benzodiazepines
      i. Diazepam: 0.05-0.1 mg/kg IV over 3-5 minutes (maximum dose is 5 mg) 2-5 minute onset of action
      or 0.1-0.2 mg/kg IM (maximum dose is 10 mg) 15-30 minute onset of action
      ii. Lorazepam: 0.05 mg/kg IV over 3-5 minutes (maximum dose is 2 mg) 2-5 minute onset of action or 0.5-2 mg IM (maximum dose is 4 mg) 15-30 minute onset of action
      iii. Midazolam: 0.05-0.1 mg/kg IV over 3-5 minutes (maximum dose 5 mg) 3-5 minute onset of action or 0.1mg/kg IM (maximum dose is 5 mg) 10-15 minute onset of action or 0.2mg/kg IN (maximum dose is 5 mg) 3-5 minute onset of action
   b. Antipsychotics: Ziprasidone:
      i. Age 5-11 years old: 10 mg IM (limited data available for pediatric use) 30-45 minute onset of action.
      ii. Age 12-18 years old: 10-20 mg IM 30-45 minute onset of action

B. Physical Management Devices
1. Body
   a. Stretcher straps should be applied as the standard procedure for all patients during transport.
   b. Physical management devices, including stretcher straps, should never restrict the patient’s chest wall motion.
   c. If necessary, sheets may be used as improvised supplemental stretcher straps. Other forms of improvised physical management devices should be discouraged.
   d. Supplemental straps or sheets may be necessary to prevent flexion/extension of torso, hips, legs by being placed around the lower lumbar region, below the buttocks, and over the thighs, knees, and legs.

2. Extremities
   a. Soft or leather devices should not require a key to release them.
   b. Secure all four extremities to maximize safety for patient, staff, and others.
   c. Secure all extremities to the stationary frame of the stretcher.
   d. Multiple knots should not be used to secure a device.

C. Patient Safety Considerations
1. The management of violent patients requires a constant reevaluation of the risk/benefit balance for the patient and bystanders in order to provide the safest care for all involved. These are complex and high-risk encounters. There is no one size fits all solution for addressing these patients.
2. Don PPE.
3. Do not attempt to enter or control a scene where physical violence or weapons are present.
4. Dispatch law enforcement immediately to secure and maintain scene safety.
5. Urgent de-escalation of patient agitation is imperative in the interest of patient safety as well as for EMS personnel and others on scene.
6. Uncontrolled or poorly controlled patient agitation and physical violence can place the patient at risk for sudden cardiopulmonary arrest due to the following etiologies:
   a. Delirium with agitated behavior/exhaustive mania: A postmortem diagnosis of exclusion for sudden death thought to result from metabolic acidosis (most likely from lactate) stemming from physical agitation or physical control measures and potentially exacerbated by stimulant drugs (e.g. cocaine) or alcohol withdrawal
   b. Positional asphyxia: Sudden death from restriction of chest wall movement and/or obstruction of the airway secondary to restricted head or neck positioning resulting in hypercarbia and/or hypoxia
7. Apply a cardiac monitor as soon as possible, particularly when pharmacologic management medications have been administered.
8. All patients who have received pharmacologic management medications must be monitored closely for the development of hypoventilation and oversedation. Utilize capnography if available.

9. Patients who have received antipsychotic medication for pharmacologic management must be monitored closely for the potential development of:
   a. Dystonic reactions (this can easily be treated with diphenhydramine)
   b. Mydriasis (dilated pupils)
   c. Ataxia
   d. Cessation of perspiration
   e. Dry mucous membranes
   f. Cardiac arrhythmias (particularly QT prolongation)

10. Placement of stretcher in sitting position prevents aspiration and reduces the patient's physical strength by placing the abdominal muscles in the flexed position.

11. Patients who are more physically uncooperative should be physically secured with one arm above the head and the other arm below the waist, and both lower extremities individually secured.

12. The following techniques should be expressly prohibited by EMS providers:
   a. Secure or transport in a prone position with or without hands and feet behind the back (hobbling or "hog-tying")
   b. "Sandwiching" patients between backboards
   c. Techniques that constrict the neck or compromise the airway
   d. EMS provider use of weapons as adjuncts in managing a patient
   e. Concurrent use of IM/IV benzodiazepines and olanzapine IM is not recommended as fatalities have been reported
AGITATED OR VIOLENT PATIENTS/BEHAVIORAL EMERGENCIES

EMT
AEMT
PARAMEDIC

Assess vital signs. Evaluate for and address any airway and breathing issues. Assess mental status

Take a SAMPLE history with particular attention to what may have triggered the undesirable behavior

If possible, assess temperature, blood glucose, and risk using a validated assessment tool

Attempt to verbally de-escalate patient. Family and friends may be helpful but can also be the source of agitation. Transport unless ALS is quickly available

If patient is a risk to themselves or personnel, pharmacologic or physical restraints may be indicated. All restraints (and particularly pharmacologic ones) require patient monitoring for adverse reactions and complications

Physical management: soft or leather restraints, secure all extremities to the stationary frame of the stretcher. Patients should NEVER be secured in prone position, sandwiched between backboards, or have restraints around the neck

Pharmacologic management: diazepam, lorazepam, midazolam. Patients must be monitored for hypoventilation and oversedation

Pharmacologic management: ziprasidone. Patients must be monitored for hypoventilation and oversedation
GENERAL CONSIDERATIONS

A. Alleviate respiratory distress.

B. Promptly identify respiratory distress, respiratory failure, and respiratory arrest, and intervene for patients who require escalation of therapy.

C. Deliver appropriate therapy by differentiating other causes of pediatric respiratory distress.

EMT

A. Evaluate
1. History:
   a. Onset of symptoms (history of choking)
   b. Concurrent symptoms (fever, cough, rhinorrhea, tongue/lip swelling, rash, labored breathing, foreign body aspiration)
   c. Sick contacts
   d. Treatments given
   e. Personal history of asthma, wheezing, or croup in past
2. Exam:
   a. Place patient in position of comfort (lap of guardian may be necessary)
   b. Full set of vital signs (T, BP, RR, P, O2 sat)
   c. Presence of stridor at rest or when agitated
   d. Description of cough
   e. Other signs of distress (grunting, nasal flaring, retracting)
   f. Color (pallor, cyanosis, normal)
   g. Mental status (alert, tired, lethargic, unresponsive)

B. Management
1. Monitoring
2. Pulse oximetry and end-tidal CO2 (ETCO2) should be routinely used as an adjunct to other forms of respiratory monitoring

C. Airway
1. Give supplemental oxygen. Escalate from a nasal cannula to a simple face mask to a non-breather mask as needed, in order to maintain normal oxygenation
2. Suction the nose and/or mouth (via bulb, Yankauer®, or suction catheter) if excessive secretions are present and patient will tolerate

AEMT/ PARAMEDIC

A. Inhaled medications:
1. Epinephrine 5 mL of 1 mg/mL (5 mg) nebulized, should be administered to all children with croup in respiratory distress with signs of stridor at rest - this medication can be repeated at this dose every 20 minutes if the child persists with stridor at rest. Use repeated doses with caution as there are case reports of arrhythmias associated with this.
2. Humidified oxygen or mist therapy is not indicated.

B. Medications – dexamethasone 0.6 mg/kg oral, IV, or IM to maximum dose of 16 mg should be administered to patients with suspected croup (other equivalently dosed steroids are acceptable). The injectable formulation of dexamethasone may be given orally to decrease the volume required.

C. 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.
D. Improvement of oxygenation and/or respiratory distress with non-invasive airway adjuncts:
   1. Continuous positive airway pressure (CPAP) should be administered for severe respiratory distress.
   2. Bag-valve-mask ventilation should be utilized in children with respiratory failure.

E. 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.
PEDIATRIC RESPIRATORY DISTRESS (CROUP)

EMT  AEMT  PARAMEDIC

Take a SAMPLE history with attention to onset of symptoms, fever and other symptoms, sick contacts, past history and any treatments given by caretakers

Place in position of comfort for exam and vital signs. Note stridor, cough, signs of respiratory distress, pallor and altered mental status. Severe respiratory distress or ineffective ventilation should be supported by BVM

Pulse oximetry and waveform capnography should be used if available

Give supplemental oxygen or suction patient only if needed since agitation may cause more distress. Transport unless ALS is quickly available

CPAP/BVM ventilation may be required for children with severe respiratory distress. The airway should be managed in the least invasive way possible.

For children with croup and stridor with respiratory distress, nebulized epinephrine should be administered and may be repeated every 20 minutes

Dexamethasone or equivalent steroid should be administered, orally if possible since IVs may cause more respiratory distress. Transport if not already en route
PEDiATRIC RESPIRATORY DISTRESS (BRONCHiOLiTis)

GENErAL CONSIDERATIONS

A. Alleviate respiratory distress.

B. Promptly identify respiratory distress, failure, and/or arrest, and intervene for patients who require escalation of therapy.

C. Deliver appropriate therapy by differentiating other causes of pediatric respiratory distress.

D. Child less than 2 years old typically with diffuse rhonchi or an otherwise undifferentiated illness characterized by rhinorrhea, cough, fever, tachypnea, and/or respiratory distress.

EMT

A. Evaluate

1. History
   a. Onset of symptoms
   b. Concurrent symptoms (e.g. fever, cough, rhinorrhea, tongue/lip swelling, rash, labored breathing, foreign body aspiration)
   c. Sick contacts
   d. History of wheezing
   e. Treatments given
   f. Number of emergency department visits in the past year
   g. Number of admissions in the past year
   h. Number of ICU admissions ever
   i. History of prematurity
   j. History of asthma, eczema, or allergies

2. Exam
   a. Full set of vital signs (T, BP, RR, P, O₂ saturation)
   b. Air entry (normal vs. diminished)
   c. Breath sounds (wheeze, crackles, rales, rhonchi, diminished, clear)
   d. Signs of distress (grunting, nasal flaring, retracting, stridor)
   e. Weak cry or inability to speak full sentences (sign of shortness of breath)
   f. Color (pallor, cyanosis, normal)
   g. Mental status (alert, tired, lethargic, unresponsive)
   h. Hydration status (+/- sunken eyes, delayed capillary refill, moist vs. dry mucous membranes, flat vs. sunken fontanels in infants)

B. Treatment and Interventions

1. Pulse oximetry and end-tidal CO₂ (ETCO₂) should be routinely used as an adjunct to other forms of respiratory monitoring

2. Perform EKG only if there are no signs of clinical improvement after treating respiratory distress

3. Airway
   a. Give supplemental oxygen – escalate from a nasal cannula to a simple face mask to a non-breather mask as needed, in order to maintain normal oxygenation
   b. Suction the nose and/or mouth (via bulb, Yankauer®, or suction catheter) if excessive secretions are present

4. 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

5. Steroids are generally not efficacious, and not given in the prehospital setting

6. Improvement of oxygenation and/or respiratory distress with non-invasive airway adjuncts
   a. Continuous positive airway pressure (CPAP) or high flow nasal cannula (HFNC) should be administered, when available, for severe respiratory distress
   b. Bag-valve-mask ventilation should be utilized in children with respiratory failure
7. Supraglottic devices and intubation
   a. Supraglottic devices and intubation should be utilized only if bag-valve-mask ventilation fails
   b. The airway should be managed in the least invasive way possible

C. Key Considerations
1. Suctioning can be a very effective intervention to alleviate distress, since infants are obligate nose breathers.
2. Insufficient data exist to recommend the use of inhaled steam or nebulized saline.
3. Though albuterol has previously been a consideration, the most recent evidence does not demonstrate a benefit in using it for bronchiolitis.
4. Ipratropium and other anticholinergic agents should not be given to children with bronchiolitis in the prehospital setting.
5. Though nebulized hypertonic saline has been shown to decrease hospital length of stay when used for bronchiolitis, it does not provide immediate relief of distress and should not be administered to children in respiratory distress in the prehospital setting.
RESPIRATORY DISTRESS - ASTHMA

GENERAL CONSIDERATIONS

A. Wheezing in the patient with respiratory distress indicates lower airway disease, which may come from a variety of causes. The patient with severe lower airway disease may have altered LOC, be unable to talk, may have absent or markedly decreased breath sounds and severe retractions with accessory muscle use.

B. Asthma is typically an illness of children greater than 2 years of age. Under 2 years of age, wheezing is more commonly associated with bronchiolitis.

C. Respiratory distress with wheezing or decreased air entry in patients 2 years or older, may be presumed to be due to bronchospasm from reactive airway disease or asthma. These patients may have a history of recurrent wheezing that improves with beta-agonist inhalers/nebulizers such as albuterol or levalbuterol.

D. Inhaled magnesium sulfate should not be administered.

E. Nebulizer droplets can carry viral particles, so additional PPE should be considered, including placement of a surgical mask over the nebulizer to limit droplet spread.

F. In the asthmatic patient, pharmacologic intervention should take priority over CPAP/BiPAP and be given in line with CPAP/BiPAP.

G. Giving positive pressure in the setting of bronchoconstriction, either via a supraglottic airway or intubation, increases the risk of air trapping which can lead to pneumothorax and cardiovascular collapse. These interventions should be reserved for situations of respiratory failure.

EMT

A. History
   a. Onset of symptoms
   b. Concurrent symptoms (fever, cough, rhinorrhea, tongue/lip swelling, rash, labored breathing, foreign body aspiration)
   c. Usual triggers of symptoms (cigarette smoke, change in weather, upper respiratory infections)
   d. Sick contacts
   e. Treatments given
   f. Previously intubated
   g. Number of emergency department visits in the past year
   h. Number of admissions in the past year
   i. Number of ICU admissions
   j. History of prematurity
   k. Family history of asthma, eczema, or allergies

B. Exam
   a. Full set of vital signs (T, BP, RR, P, O₂ sat)
   b. Air entry (normal vs. diminished, prolonged expiratory phase)
   c. Breath sounds (wheezees, crackles, rales, rhonchi, diminished, clear)
   d. Signs of distress (grunting, nasal flaring, retracting, stridor)
   e. Weak cry or Inability to speak full sentences (sign of shortness of breath)
   f. Color (pallor, cyanosis, normal)
   g. Mental status (alert, tired, lethargic, unresponsive)-If respiratory effort is insufficient or patient is becoming unconscious, assist ventilations with BVM.
   h. Hydration status (+/- sunken eyes, delayed capillary refill, mucus membranes moist vs. tacky, fontanel flat vs. sunken)
RESPIRATORY DISTRESS – ASTHMA (Continued)

i. Signs of distress include:
   i. Apprehension, anxiety, combativeness
   ii. Hypoxia (less than 90% oxygen saturation)
   iii. Intercostal/subcostal supraclavicular retractions
   iv. Nasal flaring
   v. Cyanosis

C. Place child in position of comfort, encourage parent to hold child secure position. Keep child and parent CALM.

D. Give supplemental oxygen. Escalate from a nasal cannula to a simple face mask to a non-rebreather mask as needed, in order to maintain normal oxygenation

**AEMT/ PARAMEDIC**

A. Monitoring
   a. Pulse oximetry and end-tidal CO₂ (ETCO₂) should be routinely used as an adjunct to other forms of respiratory monitoring
   b. Check an EKG only if there are no signs of clinical improvement after treating respiratory distress

B. Airway (Administer 100% oxygen in the least threatening manner.)
   a. Give supplemental oxygen. Escalate from a nasal cannula to a simple face mask to a non-rebreather mask as needed, in order to maintain normal oxygenation
   b. Suction the nose and/or mouth (via bulb, Yankauer®, suction catheter) if excessive secretions are present

C. Inhaled medications for asthma
   a. Albuterol 5 mg nebulized (or 6 puffs metered dose inhaler) should be administered to all patients in respiratory distress with signs of bronchospasm (e.g. known asthmatics, quiet wheezers) either by BLS or ALS providers - this medication can be repeated at this dose q 20 minutes for ongoing distress
   b. Ipratropium 0.5 mg nebulized should be given every 20 minutes up to 3 doses, in conjunction with albuterol

D. Utility of IV placement and fluids - IVs should be placed when there are clinical concerns of dehydration in order to administer fluids, or when administering IV medications

E. Steroids – methylprednisolone (2 mg/kg, maximum dose 125 mg) IV/IM or dexamethasone (0.6 mg/kg, maximum dose of 16 mg) IV/IM/PO may be administered in the prehospital setting. Other steroids at equivalent doses may be given as alternatives (steroids are not efficacious for bronchiolitis)

F. Magnesium sulfate (40 mg/kg IV, maximum dose of 2 g) over 10-15 minutes should be administered for severe bronchoconstriction and concern for impending respiratory failure. Anticipate hypotension. Administer with a 20 mL/kg NS bolus IV if patient has not yet received fluids.

G. Epinephrine (0.01 mg/kg of 1 mg/mL IM, maximum dose of 0.3 mg) should only be administered for impending respiratory failure as adjunctive therapy (or if anaphylaxis is a possibility) when there are no clinical signs of improvement

H. Improvement of oxygenation and/or respiratory distress with non-invasive airway adjuncts
   a. Non-invasive positive pressure ventilation via continuous positive airway pressure (CPAP) or bi-level positive airway pressure (BiPAP) should be administered for severe respiratory distress
   b. Bag-valve-mask ventilation should be utilized in children with respiratory failure

I. 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
ASTHMA (RESPIRATORY DISTRESS TYPICALLY IN CHILDREN GREATER THAN 2 YEARS OF AGE)

EMT | AEMT | PARAMEDIC

Take a SAMPLE history with attention to onset of symptoms, fever and other symptoms, sick contacts, past history of asthma and its severity, and any treatments already given

Assess vital signs including pulse oximetry. Perform an exam noting signs of increased work of breathing, abnormal lung sounds, and altered mental status

Respiratory distress is treated 100% O₂ with a NRB mask. If patient has an albuterol inhaler, assist him/her with its administration. Severe respiratory distress and ineffective ventilation should be supported by BVM ventilation. Transport unless ALS is quickly available

Mild asthma exacerbation: administer albuterol via nebulizer or MDI with spacer. Repeat every 20 minutes for ongoing respiratory distress or hypoxia

Administer steroids to all patients requiring albuterol

Moderate asthma exacerbation: add ipratropium to the first 3 doses of albuterol

Severe asthma exacerbations: start IV and administer an isotonic fluid bolus. Consider IM epinephrine for poor breath sounds or lack of clinical improvement despite treatments

Severe asthma exacerbations: administer magnesium sulfate along with the isotonic fluid bolus

Non-invasive positive pressure via BVM or CPAP may be necessary for impending respiratory failure. Transport if not already en route.

BiPAP may be necessary for impending respiratory failure
GENERAL CONSIDERATIONS

A. Stridor, gagging or choking in the breathing patient with respiratory distress may indicate upper airway obstruction.

EMT

A. Quickly obtain history and non-invasive respiratory assessment.
   1. Total airway obstruction/History of foreign body airway.
      a. Manual clearing only if foreign body is visible - NO BLIND FINGER SWEEP
      b. Back blows and chest thrust in children less than 1 year of age.
      c. Abdominal and/or chest thrusts in children over 1 year of age.
      d. If airway cannot be cleared in 60 seconds:
         i) Activate the emergency response system for immediate transport immediately to the nearest hospital.
         ii) Do not take history.
         iii) Do not make further physical assessment.
   2. Partial Airway Obstruction
      a. DO NOT AGITATE CHILD, DO NOT EXAMINE THROAT.
      b. Administer oxygen by NRB if tolerated or by “blow-by”.

B. Allow the child to assume a position of comfort. The child may assume the tripod position. Encourage parent to hold the child in a secure position. Keep child and parent (or caregiver) CALM. Do not agitate child.

C. Transport the child in a secure upright position immediately to the nearest appropriate hospital.

AEMT

D. Assume charge of situation and confer with EMS professionals about condition of patient and situation.

E. Reassess breath sounds and treat as follows:
   1. Do not establish IV access unless child is in arrest. DO NOT agitate child.
   2. If foreign body in airway is suspected in unconscious patient with complete obstruction and basic procedures are unsuccessful, try to visualize obstruction with laryngoscope.
   3. Do not attempt invasive airway unless child has respiratory arrest. Bag-valve mask ventilation is acceptable.
   4. If foreign body in airway is suspected in unconscious patient with complete obstruction, and basic procedures are unsuccessful, try to visualize obstruction with laryngoscope and remove with Magill forceps.

PARAMEDIC

F. Assume charge of situation and confer with EMS professionals about condition of patient and situation

G. Reassess breath sounds and treat as follows:
   1. If cause of upper airway obstruction is unknown and child is calm, a normal saline aerosol may be administered. DO NOT further agitate child.
   2. Do not attempt invasive airway unless child has respiratory arrest. Bag-valve mask ventilation is acceptable.
   3. If foreign body in airway is suspected in unconscious patient with complete obstruction, and basic procedures are unsuccessful, try to visualize obstruction with laryngoscope and remove with Magill forceps.
   4. If airway is completely obstructed, a needle, or surgical cricothyrotomy may be lifesaving. Contact medical control.
UPPER AIRWAY OBSTRUCTION

EMT  AEMT  PARAMEDIC

Obtain a SAMPLE history

Total airway obstruction
Manually clear airway only if foreign body is visible
Back blows and chest thrusts for less than 1 year of age. Abdominal thrusts for greater than a year of age
If child loses consciousness begin CPR and transport to closest hospital
In the unconscious child, attempt to visualize the foreign body with a laryngoscope and remove with Magill forceps
If airway remains completely obstructed, attempt needle or surgical cricothyrotomy and contact medical control. Transport if not already en route

Partial airway obstruction
Do not agitate child with exam
Administer 100% O2 via NRB mask only if tolerated
Begin transport maintaining child in position of comfort
PEDIATRIC SEIZURES

GENERAL CONSIDERATIONS

A. Seizures usually have resolved by the time the EMS professionals arrive (postictal state).

B. The basic rule with seizures is to "protect and support" the patient. If trauma, consider appropriate cervical spinal care.

C. Minimize adverse events in the treatment of seizures and seizure recurrence during transport.

D. Prompt cessation of seizures in the prehospital setting decreases morbidity.

EMT

A. Place patient away from objects on which they might injure themselves; protect but do not restrain them.

B. Clear and maintain airway, consider cervical spine injury. If signs of airway obstruction are present and not alleviated by a chin-life, jaw thrust, positioning, and/or suctioning, place an oropharyngeal airway (if gag reflex is absent) or nasopharyngeal airway.

C. Administer 100% oxygen with NRB mask. Use BVM ventilation if oxygenation/ventilation are compromised.

D. Obtain history from bystanders:
   1. Duration of current seizure
   2. Prior history of seizures, diabetes, or hypoglycemia
   3. Typical appearance of seizures
   4. Baseline seizure frequency and duration
   5. Focality of onset, direction of eye deviation
   6. Concurrent symptoms of apnea, cyanosis, vomiting, bowel/bladder incontinence, or fever
   7. Bystander administration of medications to stop the seizure
   8. Current medications, including anticonvulsants
   9. Recent dose changes or non-compliance with anticonvulsants
   10. History of trauma, pregnancy, heat exposure, or toxin exposure

E. Evaluate:
   1. For evidence of head trauma
   2. Airway patency
   3. Breath sounds, respiratory rate and chest-rise-fall
   4. Signs of perfusion (pulses, capillary refill, color)
   5. Neurologic status (GCS or AVPU, nystagmus, pupil size, focal neurologic deficits or movements)

F. Bring medication with patient if available.

G. Establish communications with medical direction and advise of patient condition. Transport immediately unless an advanced life support unit is en route and has an ETA of less than 5 minutes.
PEDIATRIC SEIZURES (Continued)

**AEMT**

A. Assist EMS professionals, obtain patient condition and circumstance

B. Apply monitor and check rhythm. Place pulse oximeter and waveform capnography to monitor oxygenation/ventilation. Goal oxygen saturation is 94-98%. Goal ETCO₂ is 40-45.

C. Determine blood sugar level.
   Blood sugar < 60 mg/dL, administer 0.5 gm/kg of dextrose IV push immediately or glucagon.
   Glucagon: Infants, Children, and Adolescents: IM, IV, SubQ: <20 kg: 0.5 mg; if no response in 15 minutes, may repeat dose. ≥20 kg: 1 mg; if no response in 15 minutes, may repeat dose.

D. In repeated seizure activity administer midazolam 0.2 mg/kg (maximum dose 10 mg), IM preferred, or IN. Do not wait for IV access, but if available, instead give one of the following:
   1. Diazepam 0.1 mg/kg IV or IO over 2-5 minutes, maximum 10 mg
   2. Lorazepam 0.1 mg/kg IV or IO over 2-5 minutes, maximum 4 mg
   3. Midazolam 0.1 mg/kg IV or IO over 2-5 minutes, maximum 5 mg

E. After benzodiazepine administration, monitor airway and be prepared to intubate and/or assist ventilation with BVM.

F. IV placement is not necessary for treatment of seizures, but could be obtained if needed for other reasons. Do not delay transport.

G. Contact medical control for seizures not corrected with benzodiazepine or dextrose, if applicable.

**PARAMEDIC**

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation.
SEIZURE

EMT

Clear and maintain airway. Consider an oral or nasal airway if necessary.

Administer 100% O2 with NRB mask. Consider BVM ventilation for evidence of hypoventilation

Obtain SAMPLE history noting duration of seizure, appearance of seizure, history of seizures, presence of illness or trauma, and medications already administered

Contact medical control and transport unless ALS is quickly available

Apply monitor and treat rhythm abnormalities. Assess ventilation using waveform capnography

Administer midazolam IM for active seizures. Do not wait for IV/IO access. Monitor for respiratory depression and be prepared to assist ventilations

Check a blood glucose

Manage hypoglycemia if present

Contact medical control and transport if not already en route
SHOCK

GENERAL CONSIDERATIONS

A. Shock is inadequate perfusion to vital organs. Shock is not only caused by blood loss (hemorrhagic shock), but it can also be caused by infection (septic shock), maldistribution of blood flow (anaphylaxis, neurogenic shock), or heart failure (cardiogenic shock). Though management of shock always starts with rapid administration of isotonic intravenous fluids, the EMS professional should differentiate between causes of shock in order to initiate additional therapies.

B. Most pediatric patients can compensate their blood pressure during shock, so the EMS professional must evaluate for other signs of shock: low body temperature or fever, altered mental status, delayed or flash capillary refill, increased heart rate for age, abnormal respiratory rate for age/hypoxia, and/or poor skin color or mottling. Tachycardia is often the first sign of shock. Do not depend on blood pressure to determine shock.

C. Transport should not be delayed. The airway must be secured and then transport immediately. It is preferable IVs and/or IOs be done during transportation.

EMT

A. Open and maintain the airway with sniffing position and the use of a nasopharyngeal airway if needed. Consider use of an oral airway only if a patient is obtunded, due to risk of inducing vomiting in an awake patient. Oral suction if needed.

B. Control all external bleeding and evaluate for dehydration/poor perfusion. Obtain history from family, especially fever or allergic exposures.

C. Provide 100% oxygen through NRB mask and, if needed, assist ventilations with a BVM.

D. Obtain vital signs, especially pulse and respirations.

E. For anaphylactic shock, the EMT may administer epinephrine auto-injectors IM. Consult Pediatric Anaphylaxis/Allergy guideline.

F. Establish communications with medical control and advise of patient condition. Transport immediately unless an advanced life support unit is in route and has an ETA of less than 5 minutes to the scene.

AEMT

A. Assist EMS professionals, obtain patient condition and history. Begin transport.

B. Apply cardiac monitor, pulse oximetry, and capnography during transport.

C. For anaphylactic shock, treat per Pediatric Anaphylaxis/Allergy guideline.

D. Initiate fluid resuscitation: if unable to obtain an IV within 2 attempts or less than 90 seconds, place an IO needle. Do not delay transport for IV.
   1. IV push fluid bolus of 20 mL/kg normal saline if signs of hypoperfusion or shock are present.
   2. If concerns of cardiogenic shock (murmur, rales, enlarged liver, or by history), administer IV fluid bolus of 10 mL/kg of NS if signs of hypoperfusion or shock are present. EMS providers must be aware that fluids can sometimes worsen cardiogenic shock. Confer with medical control and advise of patient condition if this occurs.
   3. May repeat fluid bolus, using a push-pull method, up to 3 times during transport (60 mL/kg total; give within 15 minutes if hypotensive) based on patient condition.

E. Check blood sugar and treat if hypoglycemic.
SHOCK (Continued)

PARAMEDIC

A. Assume charge of situation and confer with EMS professionals about condition of patient and situation.

B. Vasopressors (for shock unresponsive to fluids) given IV or IO.
   1. Septic shock:
      a. Norepinephrine is first-line for warm septic shock the symptoms of which include flash capillary refill, bounding pulses, and warm or flushed skin (initial dose 0.05-0.5 mcg/kg/min IV continuous infusion).
      b. Epinephrine is first-line for cold septic shock the symptoms of which include mottled skin, cool/cold to touch, delayed capillary refill (initial dose 0.05-0.3 mcg/kg/min IV continuous infusion). May give epinephrine through peripheral IV if there is no central access.
   2. Cardiogenic shock:
      a. Epinephrine 0.05-0.3 mcg/kg/min IV continuous infusion with medical control advisement
   3. Neurogenic shock – use norepinephrine (0.05-0.5 mcg/kg/min IV continuous infusion)

C. If there is a history of adrenal insufficiency or long-term steroid dependence and patient is hypotensive in persistent shock despite fluids and vasopressors, consider giving Hydrocortisone succinate, 2 mg/kg (maximum 100 mg) IV/IM.

D. Consider antipyretics for fever:
   1. Acetaminophen (15 mg/kg PO; maximum dose 1000 mg)
   2. Ibuprofen if greater than 6 months of age (10 mg/kg PO; maximum dose 800 mg)
SHOCK

EMT

Clear and maintain airway. Consider an oral or nasal airway if altered mental status

AEMT

Administer 100% O2 with NRB mask. Consider BVM ventilation for evidence of hypoventilation

PARAMEDIC

Control any external bleeding

Obtain vital signs and SAMPLE history

Evaluate perfusion and for signs of anaphylaxis. For anaphylaxis in a patient with a prior history, assist with administration of his/her own epinephrine autoinjector if available

Contact medical control and transport unless ALS is quickly available

Apply monitor and treat rhythm abnormalities. Assess ventilation using waveform capnography

For anaphylaxis, administer epinephrine IM per anaphylaxis and allergy protocols

For signs of shock or hypotension, administer an isotonic fluid bolus IV/IO by push/pull method. Repeat up to 2 more times depending on patient response

Check blood glucose

Manage hypoglycemia if present

Consider epinephrine or norepinephrine infusion for persistent fluid resistant shock

Contact medical control and transport if not already en route
TRAUMA EMERGENCIES

GENERAL CONSIDERATIONS

A. Assure scene is safe, initiate body substance isolation (BSI) by donning the appropriate personal protective equipment (PPE), determine the mechanism of injury, determine the number of patients, and request additional help if needed.

B. If patient is entrapped or inaccessible, contact medical direction and advise of condition and circumstances.

C. **Rapid triage and transport are critical!**
   1. Rapid assessment and recognition of major trauma/multiple system trauma is essential to the subsequent treatment.
   2. Once the patient is determined to be an actual or potential major/multiple system trauma patient, personnel on scene and/or medical direction must quickly determine the appropriate course of action including:
      a. Refer to the pediatric component of the *Ohio Prehospital Trauma Triage Decision Tree*
         i. Consider transport directly to a pediatric burn center children ages 0-15 years with partial or full thickness burns involving greater than 10% total body surface area (TSBA), involvement of hands/feet, genitalia, face, and/or circumferential burns
         ii. Consider transport directly to a pediatric trauma center children ages 0-15 years with moderate to severe traumatic brain injury (GCS 3-13) and those with signs of spinal cord injury.
      b. Requesting air medical evacuation from scene (see air medical transport guideline)
      c. Ground transportation directly to an appropriate facility. (When requesting bypass of nearest facility, this action must be approved by medical direction)
         i. In cases where the victim will be transported by ground units, every effort should be made to limit on scene time to 10 minutes or less to minimize transport time

D. Pediatric trauma clinical care considerations
   1. Each infant and child should be evaluated by the Pediatric Glasgow Coma Scale and the score relayed to medical direction.
   2. The proper size equipment is very important to resuscitation care. Refer to length-based drug treatment guide (e.g. BROSELOW® PEDIATRIC EMERGENCY TAPE or similar guide) when unsure about patient weight, age and/or drug dosage and when choosing equipment size.
   3. Common errors of pediatric trauma resuscitation are:
      a. Failure to open and maintain the airway
      b. Failure to provide appropriate fluid resuscitation to children with head injury
      c. Failure to recognize and treat internal hemorrhage

EMR OR EMT

A. Pediatric Trauma Assessment
   1. Identify life threats through a rapid initial assessment of airway, breathing, circulation and neurologic status. Life threats should be addressed first. The assessment provides a general impression of patient condition and prioritization for interventions and transport.
      a. Hemorrhage control - assess for and stop severe hemorrhage
      b. Airway
         i. Assess airway patency by asking the patient to talk to assess stridor and ease of air movement
         ii. Look for injuries that may lead to airway obstruction including unstable facial fractures, expanding neck hematoma, blood or vomitus in the airway, facial burns/inhalation injury
         iii. Evaluate mental status for ability to protect airway (patients with a GCS less than or equal to 8 are likely to require airway protection)
c. Breathing
   i. Assess respiratory rate and pattern
   ii. Assess symmetry of chest wall movement
   iii. Listen bilaterally on lateral chest wall for breath sounds

d. Circulation
   i. Assess blood pressure and heart rate
   ii. Signs of hemorrhagic shock include: tachycardia, hypotension, pale, cool clammy skin, capillary refill greater than 2 seconds

e. Disability
   i. Perform neurologic status assessment and assign GCS or AVPU
   ii. Assess gross motor movement of extremities
   iii. Evaluate for clinical signs of traumatic brain injury with herniation including:
      a) Unequal pupils
      b) Lateralizing motor signs
      c) Posturing

f. Exposure
   i. Rapid evaluation of entire body to identify sites of penetrating wounds or other blunt injuries. Be sure to roll patient and examine the back
   ii. Prevent hypothermia

2. Urgent patient
   a. Children with airway or breathing compromise, major hemorrhage, hemodynamic instability, penetrating torso trauma, or signs of traumatic brain injury often require rapid critical care stabilization. Minimize scene time (goal is under 10 minutes) and initiate rapid transport to the highest level of care within the trauma system.
   b. Decisions regarding transport destination should be based on the Ohio Prehospital Trauma Triage Decision Tree or local prehospital trauma triage guideline
   c. Detailed physical exam and ongoing assessment - Evaluate patient head-to-toe and assess effectiveness of treatments to this point

3. Non-Urgent patient
   a. Single and/or non-life-threatening injuries
   b. Focused physical exam of injured area and management of the situation
   c. Transport patient. Decisions regarding transport destination should be based on the Ohio Prehospital Trauma Triage Decision Tree or local prehospital trauma triage guideline.

B. Urgent trauma treatment
1. Hemorrhage control
   a. Apply direct pressure to bleeding site followed by pressure dressing.
   b. If direct pressure/pressure dressing is ineffective or impractical:
      i. If the bleeding site is amenable to tourniquet placement, apply tourniquet to extremity
         a) Tourniquet should be placed 2-3 inches proximal to wound, not over a joint, and tightened until bleeding stops and distal pulse is eliminated
         b) If bleeding continues, place a second tourniquet proximal to the first
         c) For thigh wounds, consider placement of two tourniquets, side-by-side, and tighten sequentially to eliminate distal pulse
      ii. If the bleeding site is not amenable to tourniquet placement (i.e. junctional injury), pack wound tightly with a hemostatic gauze and apply direct pressure
   c. Groin/axillary injury
      i. Apply direct pressure to wound
      ii. If still bleeding, pack wound tightly with hemostatic gauze and apply direct pressure
      iii. Consider using a junctional hemostatic device if available
TRAUMA EMERGENCIES (Continued)

2. Airway
   a. Establish patent airway with cervical spinal motion restriction (see Spinal Injury)
   b. If patient is unable to maintain airway, consider oral airway (nasal airway should not be used with significant facial injury or possible basilar skull fracture)

3. Breathing
   a. Monitor oxygen saturation
      i. Provide supplemental oxygen
      ii. Maintain oxygen saturation greater than 93%
   b. If respiratory effort is inadequate, assist with bag-mask ventilation
   c. Monitor capnography, if available
      i. Maintain end tidal CO₂ between 35-40 mmHg
   d. For open chest wound, place semi-occlusive dressing

4. Circulation
   a. If pelvis is unstable and patient is hypotensive, place pelvic binder or sheet to stabilize pelvis

5. Disability
   a. See Head Injury and Spine Injury sections
   b. Provide spinal motion restriction per Spine Injury assessment and guideline
   c. If clinical signs of severe traumatic brain injury, consider elevating the head of the gurney 30 degrees
   d. If signs of herniation (GCS 3, abnormal respiratory pattern, asymmetric pupils, bradycardia with hypertension, and posturing), consider brief periods of hyperventilation (end tidal CO₂ 20-35 mmHg)

6. Exposure
   a. Avoid hypothermia
      i. Remove wet clothing
      ii. Cover patient to prevent further heat loss

C. Non-urgent trauma treatment
1. Splint all fracture(s)
   a. Monitor pulses distal to the fracture site
   b. Monitor distal skin color, temperature, neurological status

AEMT

Assist EMS professionals; obtain patient condition and circumstance.

A. Urgent trauma treatment
1. Airway and Breathing
   a. If impending airway obstruction altered mental status resulting in inability to maintain airway patency or respiratory arrest, perform orotracheal intubation if BVM is ineffective
   b. If absent or diminished breath sounds in a hypotensive patient, consider tension pneumothorax and perform needle decompression
2. Circulation
   a. An IO infusion is indicated in the trauma setting when shock needs to be treated and rapid venous access is unobtainable.
   b. If child demonstrates tachycardia for age with signs of poor perfusion (low BP, greater than 2-second capillary refill, altered mental status, hypoxia, weak pulses, pallor, or mottled/cool skin), give 20 ml/kg crystalloid bolus and reassess.
   c. Maintain SBP as follows:
      i. less than 1 month: greater than 60 mmHg
      ii. 1-12 months: greater than 70 mmHg
      iii. 1-10 years: greater than 70 mmHg + 2 X the patient’s age in years
3. Consider fentanyl or other analgesic per local protocols. Use those agents known to cause hypotension (i.e. morphine) with caution.
PARAMEDIC

Assume charge of situation and confer with EMS professionals about condition of patient and situation.

A. Urgent trauma treatment
   1. If unable to secure airway through orotracheal intubation, perform needle or surgical cricothyrotomy.

SPECIFIC INJURIES

A. Chest Wounds
   1. For sucking chest wounds or an open pneumothorax, cover the wound with a non-porous dressing sealing 3 sides, apply a vented chest seal, or leave the wound open.
   2. Stabilize flail chest with trauma dressing.

B. Evisceration
   1. Cover organs with sterile dressing moistened with saline.
   2. Lay the patient flat and elevate the knees.

C. Complete Amputations
   1. Control bleeding by the most appropriate method. Rapid application of a tourniquet can be life-saving for arterial bleeding.
   2. Always take time to find the avulsed part, but do not delay patient transport. Transport the avulsed body part to the hospital as follows:
      a. Put avulsed body part in a cool, dry sterile dressing
      b. Avoid direct contact with ice

D. Pneumothorax / Hemothorax / Tension Pneumothorax
   1. If awake alert and stable, transport patient in position of comfort and watch for signs of a tension pneumothorax.
   2. Symptoms of tension pneumothorax include tachycardia, jugular venous distention, hypotension, hyperresonance on affected side, diminished or absent breath sounds on affected side, tracheal deviation away from affected side (late sign).
   3. AEMT or Paramedic may perform needle decompression of chest.

E. Head Injury
   1. Perform neurologic status assessment.
      a. Pupil size and reaction to light
      b. Grade level of consciousness using GCS or AVPU
         i. Brain injury severity guideline:
            (a) Mild: GCS 13-15 / AVPU = (A)
            (b) Moderate: GCS 9-12 / AVPU = (V)
            (c) Severe: GCS 3-8 / AVPU = (P) or (U)
      c. Assess motor strength and sensation in all four extremities
   2. If endotracheal intubation or invasive airways are used, continuous waveform capnography is required to document proper tube placement and assure proper ventilation rate.
   3. Recognize and treat herniation.
      a. Signs of herniation
         i. Decreasing mental status
         ii. Abnormal respiratory pattern
         iii. Asymmetric/unreactive pupils
         iv. Decorticate posturing
         v. Cushing's response (bradycardia and hypertension)
         vi. Decerebrate posturing
TRAUMA EMERGENCIES (Continued)

b. Treatment options
   i. Elevate the head of the gurney by 30 degrees
   ii. Episodic hyperventilation

F. Spinal Injury
1. Mechanism alone should not determine if a patient requires spinal motion restriction; however, the mechanisms listed below have been associated with a higher risk of injury:
   a. Motor vehicle crashes (including automobiles, all-terrain vehicles, and snowmobiles)
   b. Axial loading injuries to the spine
   c. Falls greater than 10 feet
2. Place patient in a cervical collar if any of the following are present:
   a. Any abnormal mental status (including extreme agitation and intoxication)
   b. Complaint of midline neck or spine pain
   c. Any midline neck or spinal tenderness with palpation
   d. Limited range of neck motion by report or exam
   e. Another severe injury is present, particularly torso injuries
   f. Focal or neurologic deficit
3. If none of the above apply, the patient may be managed without a cervical collar.
4. Patients with penetrating injury to the neck should not be placed in a cervical collar or other spine precautions regardless of whether they are exhibiting neurologic symptoms or not. Doing so can lead to delayed identification of injury or airway compromised and has been associated with increased mortality.
5. If patient is wearing a helmet, follow the helmet removal guideline in the Special Procedures chapter.
6. Do not transport patients on rigid long boards unless the clinical situation warrants long board use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board after transfer to the gurney will delay transport and/or other treatment priorities. In these situations, long boards should ideally be padded or have a vacuum mattress applied to minimize secondary injury to the patient.
7. Patient with severe kyphosis or ankylosing spondylitis may not tolerate a cervical collar. These patients should be immobilized in a position of comfort using towel rolls or sand bags.
8. Always contact medical direction and relay information regarding patient with potential spinal injury to the hospital. Patients with spinal injuries may need to be delivered to another facility if the hospital initially contacted does not have the resources to adequately manage this injury.
9. If patient is alert and complaining of severe pain, consider pain relief per local protocol.
TRAUMA

EMR/EMT → AEMT → PARAMEDIC

Assess for and stop severe hemorrhage

Assess airway patency and address issues maintaining spinal precautions depending on mechanism of injury

Assess breathing and support oxygenation with 100% O2 NRB mask and ventilation with BVM ventilations if necessary

Assess for signs of shock and poor perfusion

Perform neurologic assessment using GCS or AVPU. Note pupillary size and response to light. Note ability to move all extremities

Expose patient to identify all wounds and injuries, then cover to prevent hypothermia

Obtain vital signs and SAMPLE history

Urgent patients
Airway or breathing compromise, major hemorrhage, hemodynamic instability, penetrating torso trauma, or signs of traumatic brain injury often require rapid surgical intervention. Minimize scene time (goal is under 10 minutes) and initiate rapid transport to the highest level of care within the trauma system.

1. Patients with unstable airways or requiring prolonged BVM ventilation may require an advanced airway.
2. Patients with concern for pneumothorax may require needle decompression
3. Patients with signs of shock or poor perfusion require IO/IV bolus of isotonic fluids
4. Contact medical control to discuss the cautious use of pain medications in multisystem trauma patients

Inability to oxygenate or ventilate a patient with an advanced airway may require consideration for a needle or surgical cricothyotomy

Non-Urgent patient
Single or non-life threatening injuries. Focused physical exam of injured area and management of that injury. Transport to appropriate facility based on local prehospital trauma triage guidelines

Consider pain management per pain management protocols
# Modified Glasgow Coma Scale for Infants and Children

<table>
<thead>
<tr>
<th></th>
<th>Child</th>
<th>Infant</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye opening</strong></td>
<td>Spontaneous</td>
<td>Spontaneous</td>
<td>4</td>
</tr>
<tr>
<td>To speech</td>
<td>To speech</td>
<td>To pain only</td>
<td>3</td>
</tr>
<tr>
<td>To pain only</td>
<td>To pain only</td>
<td>No response</td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>No response</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Best verbal response</strong></td>
<td>Oriented, appropriate</td>
<td>Coos and babbles</td>
<td>5</td>
</tr>
<tr>
<td>Confused</td>
<td>Irritable cries</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate words</td>
<td>Cries to pain</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Incomprehensible sounds</td>
<td>Moans to pain</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>No response</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Best motor response</strong>*</td>
<td>Obey commands</td>
<td>Moves spontaneously and</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Localizes painful stimulus</td>
<td>purposefully</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Withdraws in response to pain</td>
<td>Withdraws to touch</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Flexion in response to pain</td>
<td>Withdraws to response in pain</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Extension in response to pain</td>
<td>Abnormal flexion posture to pain</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No response</td>
<td>Abnormal extension posture to</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pain</td>
<td></td>
</tr>
</tbody>
</table>

*If patient is intubated, unconscious, or preverbal, the most important part of this scale is motor response. Motor response should be carefully evaluated.*
PEDIATRIC AIRWAY MANAGEMENT

INDICATION

To provide effective oxygenation and ventilation when severe respiratory distress or respiratory failure are identified in a pediatric patient.

**NOTE:** Orotracheal intubation is outside of the Ohio EMS scope of practice for EMTs although the insertion of dual lumen or extraglottic airways in is permitted in patients who are apneic and pulseless.

EMT

PATIENT MANAGEMENT

A. Assessment
   1. History – Assess for:
      a. Time of onset of symptoms
      b. Associated symptoms
      c. History of asthma or other breathing disorders
      d. Choking or other evidence of upper airway obstruction
      e. History of trauma

B. Physical Examination – Assess for:
   1. Shortness of breath
   2. Abnormal respiratory rate and/or effort
   3. Use of accessory muscles
   4. Quality of air exchange, including depth and equality of breath sounds
   5. Wheezing, rhonchi, rales, or stridor
   6. Cough
   7. Abnormal color (cyanosis or pallor)
   8. Abnormal mental status
   9. Evidence of hypoxemia
   10. Signs of a difficult airway (short jaw or limited jaw thrust, small thyromental space, upper airway obstruction, large tongue, obesity, large tonsils, large neck, craniofacial abnormalities, excessive facial hair)

C. Treatment and interventions
   1. Non-invasive ventilation techniques
      a. Maintain airway and administer oxygen as appropriate with a target of achieving 94-98% saturation
      b. For severe respiratory distress or impending respiratory failure, use continuous positive airway pressure (CPAP), bilevel positive airway pressure (BiPAP), intermittent positive pressure breathing (IPPB), and/or bilevel nasal CPAP
      c. Use bag-valve mask (BVM) ventilation in the setting of respiratory failure or arrest. Two-person, two-thumbs-up BVM ventilation is more effective than one-person technique and should be used when additional providers are available
   2. Oropharyngeal airways (OPA) and nasopharyngeal airways (NPA) - Consider the addition of an OPA and/or NPA to make BVM ventilation more effective, especially in patients with altered mental status.
   3. Supraglottic airways (SGA) or extraglottic devices (EGD) - Consider the use of a SGA or EGD if BVM is not effective in maintaining oxygenation and/or ventilation. Examples include, but are not limited to the laryngeal mask airway (LMA) or a blind insertion airway device (BIAD), e.g. King® laryngeal tube. This is especially important in children since endotracheal intubation is an infrequently performed skill in this age group and has not been shown to improve outcomes.
AEMT/ PARAMEDIC

4. Endotracheal intubation
   a. When less-invasive methods (BVM, SGA/EGD placement) are ineffective, use endotracheal intubation to maintain oxygenation and/or ventilation
   b. Other indications may include potential airway obstructions, severe burns, multiple traumatic injuries, altered mental status or loss of normal protective airway reflexes
   c. Monitor clinical signs, pulse oximetry, cardiac rhythm, blood pressure, and capnography for the intubated patient
   d. Video laryngoscopy may enhance intubation success rates, and should be used when available. Consider using a bougie, especially when video laryngoscopy is unavailable and glottic opening is difficult to visualize with direct laryngoscope.

5. Post-intubation management
   a. Confirm placement of advanced airway (endotracheal tube, SGA, or EGD) with waveform capnography, absent gastric sounds, and bilateral breath sounds
   b. Continuously monitor placement with waveform capnography during treatment and transport
   c. Continuously secure tube manually until tube secured with tape, twill, or commercial device
      i. Note measurement of tube at incisors or gum line and monitor frequently for tube movement/displacement
      ii. Cervical collar and/or cervical immobilization device may help reduce neck movement and risk of tube displacement
   d. Inflate endotracheal tube cuff with minimum air to seal airway. An ETT cuff manometer can be used to measure and adjust the ETT cuff pressure to a recommended 20 cm H₂O pressure
   e. Ventilation
      i. Tidal volume
         (a) Ventilate with minimal volume to see chest rise, approximately 6-7 mL/kg ideal body weight
         (b) Over-inflation may be detrimental
      ii. Rate
         (a) Adult: 10-12 breaths/minute
         (b) Child: 20 breaths/minute
         (c) Infant: 30 breaths/minute
      iii. Continuously monitor ETCO₂ to maintain ETCO₂ of 35-40 mmHg - in head injury with signs of herniation (unilateral dilated pupil or decerebrate posturing), modestly hyperventilate to ETCO₂ 30 mmHg
   f. Consider sedation with sedative or opioid medications if agitated

6. Gastric decompression may improve oxygenation and ventilation, so it should be considered when there is obvious gastric distention.

7. When patients cannot be oxygenated/ventilated effectively by previously mentioned interventions, the provider should consider needle cricothyroidotomy if the risk of death for not escalating airway management seems to outweigh the risk of a procedural complication.

8. Transport to the closest appropriate hospital for airway stabilization when respiratory failure cannot be successfully managed in the prehospital setting.
D. Key Considerations

1. When compared to the management of adults with cardiac arrest, paramedics are less likely to attempt endotracheal intubation in children with cardiac arrest. Further, paramedics are more likely to be unsuccessful when intubating children in cardiac arrest and complications such as malposition of the ET tube or aspiration can be nearly three times as common in children as compared to adults.

2. Use continuous waveform capnography to detect end-tidal carbon dioxide (ETCO₂). This is an important adjunct in the monitoring of patients with respiratory distress, respiratory failure, and those treated with positive pressure ventilation. It should be used as the standard to confirm SGA, EGD, and endotracheal tube placement. Effective January 1, 2021, the utilization of waveform capnography is mandatory for all patients requiring invasive airway devices (including dual lumen and extraglottic devices) with the exception of stable patients with no cardiac or pulmonary complaints or symptoms unless ordered by the transferring physician.

3. CPAP, BiPAP, high flow nasal cannula:
   a. Contraindications to these non-invasive ventilator techniques include intolerance of the device, severely impaired consciousness, increased secretions inhibiting a proper seal, or recent gastrointestinal and/or airway surgery

4. Bag-valve-mask:
   a. Appropriately-sized masks should completely cover the nose and mouth and maintain an effective seal around the cheeks and chin
   b. Ventilation should be delivered with only sufficient volume to achieve chest rise
   c. Ventilation rate:
      i. During CPR, ventilation rate should be 10 breaths per minute, one breath every 10 compressions (or one breath every 6 seconds). When advanced airway is in place, ideally ventilations should be on upstroke between two chest compressions
      ii. In adults who are not in cardiac arrest, ventilate at rate of 12 breaths per minute
      iii. In children, ventilating breaths should be delivered over one second, with a two second pause between breaths (20 breaths/minute) in children

5. Orotracheal intubation
   a. Endotracheal tube sizes

<table>
<thead>
<tr>
<th>Age</th>
<th>Size (mm) Uncuffed</th>
<th>Size (mm) Cuffed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Term to 3 months</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>3-7 months</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td>7-15 months</td>
<td>4.0</td>
<td>3.5</td>
</tr>
<tr>
<td>15-24 months</td>
<td>4.5</td>
<td>3.5</td>
</tr>
<tr>
<td>2-15 years</td>
<td>[age(yr)/4]+4</td>
<td>[age(yr)/4]+3.5</td>
</tr>
</tbody>
</table>
b. Approximate depth of insertion = (3) x (endotracheal tube size)
c. In addition to preoxygenation, apneic oxygenation (high-flow oxygen by nasal cannula) may prolong the period before hypoxia during an intubation attempt
d. Positive pressure ventilation after intubation can decrease preload and subsequently lead to hypotension - consider providing vasopressor support for hypotension
e. Appropriate attention should be paid to adequate preoxygenation to avoid peri-intubation hypoxia and subsequent cardiac arrest
f. Prompt suctioning of soiled airways before intubation attempt may improve first pass success
g. Confirm successful placement with waveform capnography. Less optimal methods of confirmation include bilateral chest rise, bilateral breath sounds, and maintenance of adequate oxygenation. Color change on end-tidal CO2 is less accurate than clinical assessment, and wave-form capnography is superior. Misting observed in the tube is not a reliable method of confirmation. Visualization with video laryngoscopy, when available, may assist in confirming placement when unclear due to capnography failure or conflicting information.
h. Ongoing education and hands-on practice is essential to maintain skills. This is especially true for children since pediatric intubation is an infrequently utilized skill for many prehospital providers.
i. Video laryngoscopy may be helpful, if available, to assist with endotracheal intubation

6. Consideration should be made to dispatch the highest-level provider for an EMS system given the potential need for advanced airway placement for patients with severe respiratory distress or failure
PEDIATRIC AIRWAY MANAGEMENT

EMT  AEMT  PARAMEDIC

Obtain rapid SAMPLE history, vital signs including pulse oximetry and capnography, and physical exam

Assess ability to maintain patent airway, oxygenation, and ventilation

Failure to oxygenate but maintaining ventilation

100% O₂ via NRB mask

Continued failure to oxygenate

Failure to ventilate

1. CPAP may be attempted depending on availability of equipment
2. BVM ventilation with 100% O₂. Oral or nasal airways increase effectiveness if tolerated
3. Supraglottic or extraglottic devices if BVM is ineffective or transport time is prolonged (EMTs ONLY IN PULSELESS/APNEIC PATIENTS; AEMTs ONLY IN APNEIC PATIENTS)

Endotracheal intubation may be required when BVM and supraglottic or extraglottic devices are ineffective. (AEMTs ONLY IN PULSELESS/APNEIC PATIENTS)

1. Video laryngoscopy may enhance intubation success rates
2. Placement of advanced airways should always be confirmed by waveform capnography

Transport to a hospital where the patient can receive definitive care. Transport to the closest appropriate hospital for airway stabilization when respiratory failure cannot be successfully managed in the prehospital setting

When patients cannot be oxygenated/ventilated effectively by previously mentioned interventions, the provider should consider needle or surgical cricothyrotomy if the risk of death for not escalating airway management seems to outweigh the risk of a procedural complication.
GENERAL CONSIDERATIONS

A. Treat the ABCs first. Treat the child, not the equipment. If the emergency is due to an equipment malfunction, manage the child appropriately using your own equipment.

B. Children formerly cared for in hospitals or chronic care facilities are often cared for in homes by parents or other caretakers. These children may have self-limiting or chronic diseases. There are a multitude of underlying medical conditions that may categorize children as having special needs. Many are often unstable and may frequently involve the EMS system for evaluation, stabilization, and transport. Special needs children include technology-assisted children such as those with tracheostomy tubes with or without assisted ventilation, children with gastrostomy tubes, and children with indwelling central lines. The most serious complications are related to tracheostomy problems due to the high risk of airway compromise and resultant hypoxia.

C. CSHCN have many allergies. Children with spina bifida are often allergic to latex. Before treating a patient, ask the caregivers if the children are allergic to latex or have any other allergies. If possible, keep latex-free equipment. (Some regularly used equipment that contains latex includes gloves, oxygen masks, IV tubing BVM, blood pressure cuff, IV catheters, etc.)

D. Knowing which children in a given area have special needs and keeping a log book is encouraged.

E. Parents and caretakers are usually trained in emergency management and can be of assistance to EMS personnel. Listen carefully to the caregiver and follow his/her guidance regarding the child's treatment.

F. Children with chronic illnesses often have different physical development from well children. Therefore, their baseline vital signs may differ from normal standards. The size and developmental level may be different from age-based norms and length-based tapes used to calculate drug dosages. Ask the caregiver if the child normally has abnormal vital signs. (i.e. a fast heart rate or a low pulse oximeter reading)

G. Some CSHCN may have sensory deficits (i.e. they may be hearing impaired or blind) yet may have age-appropriate cognitive abilities. Follow the caregivers' lead in talking to and comforting a child during treatment and transport. Do not assume that a CSHCN is developmentally delayed.

H. When moving a special needs child, a slow careful transfer with two or more people is preferable. Do not try to straighten or unnecessarily manipulate contracted extremities as it may cause injury or pain to the child. Certain medical conditions will require special care. Again, consult the child’s caregiver.

I. Caregivers of CSHCN often carry "go bags" or diaper bags that contain supplies to use with the child's medical technologies and additional equipment such as extra tracheostomy tubes, adapters for feeding tubes, suction catheters, etc. Before leaving the scene, ask the caregivers if they have a "go bag" and carry it with you.

J. Caregivers may also carry a brief medical information form or card. The child may be enrolled in a medical alert program whereby emergency personnel can get quick access to the child's medical history. Ask the caregivers if they have an emergency information form or some other form of medical information for their child.

K. Caregivers of CSHCN often prefer that their child be transported to the hospital where the child is regularly followed or the "home" hospital. When making the decision as to where to transport a CSHCN, take into account: local protocols, the child’s condition, capabilities of the local hospital, caregivers’ request, ability to transport to certain locations and the ability to request helicopter transport for distant home hospitals.
CHILDREN WITH TRACHEOSTOMIES

GENERAL CONSIDERATIONS

The child should be examined for other possible problems. Do not assume the problem is with the tracheostomy tube.

EMT

A. Examine the child quickly for possible causes of distress which may be easily correctable, such as a detached oxygen source.

B. Try to establish the child’s baseline: the child may never look normal.

C. If on a ventilator, remove the child from the ventilator and bag the child with a secure oxygen source; there may be a problem with the ventilator or oxygen source.

D. If still no improvement, immediately transport to the nearest medical facility; initiate appropriate resuscitation as needed. Suction the child through the previously established endotracheal airway device or stoma as accumulation of debris is a common cause of obstruction.

AEMT/ PARAMEDIC

A. If suctioning does not relieve the obstruction and the tracheostomy tube has a cannula, remove it. If it is the cause of obstruction, there should be immediate improvement. A tracheostomy tube that has been previously removed may be replaced after ensuring that the lumen has been cleaned and all obstructive debris has been cleared from the lumen.

B. If there is no improvement after suctioning and/or removal of the inner cannula and the child is in severe respiratory distress, an occluded tracheostomy tube should be removed and ventilation via bag valve mask and should be attempted. The removal of endotracheal devices following recent surgical placement should be avoided due to increased potential of airway collapse and resultant respiratory compromise. If an endotracheal or tracheostomy tube is available, insert it into the stoma and resume ventilation (a previously used tracheostomy tube following cleansing and removal of any obstructive debris from the lumen can be inserted.)

C. If there is still no improvement see the respiratory distress protocol.
CHILDREN WITH IN-DWELLING CENTRAL LINES

GENERAL CONSIDERATIONS

A. Children may have central lines in several locations and some complications are due to location; some central lines are located under the skin and can be felt but not seen.

B. The most common emergencies with central lines include, blockage of the line, complete or partial accidental removal, complete or partial laceration of the line, or possible infection in the central line which may lead to sepsis.

EMT/ AEMT/ PARAMEDIC

A. Always evaluate child for cardiovascular stability as some complications may be life threatening.

B. Children may be experiencing complications from their underlying medical condition; ask caretakers about the child’s condition.

C. If line is blocked, do not attempt to force the catheter open, transport to a facility capable of managing central lines.

D. For complete removal, do not attempt to reinsert; transport to the nearest emergency department. Infections are a common complication; don’t try to push a line back in, even if it is only slightly out.

E. For complete removal, maintain pressure on site until bleeding has stopped; transport child and catheter to nearest emergency department (part of the catheter may have broken off.) Always bring the line with you to the hospital.

F. For partial or complete laceration of the line, clamp proximally to laceration utilizing a padded clamp and transport child and catheter to nearest emergency department.

G. For children with sudden deterioration begin basic resuscitation and transport to nearest emergency facility (child may have pneumothorax or internal bleeding.)

H. If there are fluids infusing through the central line, determine the nature of the fluid and the time that the fluid was started.

I. For paramedics only: May use central line for IV access if permitted by protocol, and given clearance by medical control.
CHILDREN WITH GASTROSTOMY TUBES

GENERAL CONSIDERATIONS

A. Children with gastrostomy tubes may have complications of obstruction or dislodgment; obstruction is usually not an emergency but the child may require transport; dislodgment is not life threatening but the tube should be replaced as soon as possible. Both conditions are easily recognized.

B. The child should be examined for any other possible problems.

EMT/ AEMT

A. Children who have problems with their tubes may have problems with regurgitation or aspiration.

B. Be aware of and address any other possible problems from their underlying medical condition.

C. Transport the child and the tube to the nearest facility capable of replacing the tube; this is not an emergency transport.

D. Do not attempt to replace the tube; it is not as easy as it seems and there may be other complications.

E. Cover the site with a sterile dressing and control any bleeding with direct pressure.

PARAMEDIC

F. If there are fluids infusing through the feeding tube, determine the nature of the fluids and the time that the fluids were started. If the tube appears damaged, or the site is irritated, stop all infusing fluids, flush the tube with water, and clamp the tube.

G. If a child with a gastrostomy tube is receiving BVM ventilation, it is often helpful to open the tube to keep the stomach from getting distended.
CHILDREN ON VENTILATORS

GENERAL CONSIDERATIONS

A. Children on mechanical ventilation may exhibit sudden or gradual deterioration, cardiac arrest, increased oxygen demand, increased respiratory rate, retractions, or change in mental status.

B. Examine the child quickly for possible causes of distress which may be easily correctable (e.g. detached oxygen source) the caretakers will often have done this but double check.

C. Medications the child is presently taking may be the cause of deterioration.

D. Try to establish the child’s baseline; the child may never look normal.

EMT

A. Remove the child from the ventilator and bag the child with a secure oxygen source; if the child improves there may be a problem with the ventilator or oxygen source.

B. If there is no improvement immediately transport to the nearest medical facility; initiate appropriate resuscitation as needed. Suction the child through a previously established endotracheal device as accumulation of debris is a common cause of obstruction.

AEMT/ PARAMEDIC

A. If suctioning does not relieve the obstruction and the patient has a tracheostomy tube, remove the inner cannula. If it is the cause of obstruction, there should be immediate improvement. A tracheostomy tube that has been previously removed may be replaced after ensuring that the lumen has been cleaned and all obstructive debris has been cleared from the lumen.

B. If there is no improvement after suctioning and/or removal of the inner cannula and the child is in severe respiratory distress, an occluded endotracheal or tracheostomy tube should be removed and ventilation via bag valve mask and should be attempted. The removal of endotracheal devices following recent surgical placement should be avoided due to increased potential of airway collapse and resultant respiratory compromise. If another endotracheal or tracheostomy tube is available, insert into the stoma and resume ventilation (a previously used tracheostomy tube following cleansing and removal of any obstructive debris from the lumen can be inserted.)

C. If there is still no improvement see the respiratory distress protocol.
SPECIALTY CARE WITHIN THE PRACTICE OF EMS MEDICINE

As its foundation has solidified, the depth and breadth of the capabilities and responsibilities of EMS has significantly expanded and matured. The health care delivery by EMS personnel is no longer limited to the confines of an ambulance.

Specialty care within the practice of EMS has been in existence for many years. This chapter was added to the State of Ohio Adult EMS Guidelines and Procedures Manual in 2018 and, analogous to the other chapters, will be dynamic over time. This chapter is not all-inclusive of the sectors of specialty care within EMS. The content of this chapter is solely directed at the sectors that have been formally cited by the EMFTS Board or within the Ohio Revised Code or Ohio Administrative Code.

Various institutions and organizations offer specialty care education and training, and some programs provide documentation of course completion or certification. Regardless of these documents or the training provided, the EMS provider certifications and professional titles recognized and legislatively established in the State of Ohio are emergency medical responder, emergency medical technician, advanced emergency medical technician, and paramedic. The terms or descriptors such as “community paramedic”, “critical care paramedic”, or “tactical EMS” do not exist in Ohio EMS legislation or regulation and are not recognized by the EMFTS Board. Regardless of the specialty care education or training provided, a certified Ohio EMS provider must comply with the following:

1. Function under the authority of a medical director who meets the qualifications cited in Ohio Administrative Code 4765-3-05
2. Restrict the performance of skills to the Ohio EMS scope of practice authorized by the EMFTS Board for the associated level of Ohio EMS certification.

In addition, the EMS medical director must provide authorization, a written protocol, training, continuing education, and a quality assurance program for all of the skills performed by the EMS providers under his or her medical direction. Regardless of the training or education provided, the EMS medical director may not permit skills that exceed the Ohio EMS scope of practice authorized by the EMFTS Board for the associated level of Ohio EMS certification.
MOBILE INTEGRATED HEALTHCARE

In August 1996, the National Highway Transportation Safety Administration, the agency that oversees EMS at the federal level, published a pinnacle report, *Emergency Medical Services: Agenda for the Future*. At the beginning of this document, there is a statement titled "The Vision" that has embraced as the overarching quest and purpose of EMS. "The Vision" states, "Emergency medical services (EMS) of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources and will be integrated with other health care providers and public health and public safety agencies. It will improve community health and result in more appropriate use of acute health care resources. EMS will remain the public’s emergency medical safety net.” With respect to the integration of health services, the *Agenda for the Future* provided the following recommendations for EMS:

- Expand the role of EMS in public health
- Involve EMS in community health monitoring activities
- Integrate EMS with other health care providers and provider networks
- Incorporate EMS within health care networks’ structure to deliver quality care
- Be cognizant of the special needs of the entire population
- Incorporate health systems within EMS that address the special needs of all segments of the population

*Emergency Medical Services at the Crossroads*, a report published by the Institute of Medicine of the National Academies in June 2006, noted that the EMS systems remain fragmented. The report, like the *Agenda for the Future*, continued to support the evolution and incorporation of EMS as an integral component of the overall healthcare system. One of the recommendations was for the Department of Health and Human Services, the Department of Transportation, and the Department of Homeland Security to jointly undertake a detailed assessment of the emergency and trauma workforce capacity, trends, and future needs, and develop strategies to meet these needs in the future. The report describes a vision of a 21st century emergency care and trauma system where 9-1-1 dispatchers, EMS personnel, medical providers, public safety officers, and public health officials are interconnected and united to ensure that each patient receives the most appropriate care, at the optimal location, with minimal delay.

Over the past several decades, the model of medical care delivery has shifted significantly from the inpatient setting to the outpatient setting. The stimuli for the generation of this model includes, but is not limited to, advancements in medical technology and treatment modalities, a need for improved fiscal oversight and allocation of resources, and the desire of the general public to access and receive care without enduring a separation from their residential environment. In addition, our nation’s philosophy of acceptable healthcare has shifted its focus placing a greater emphasis on health maintenance and on illness and injury prevention.

Mobile integrated healthcare is another step toward more aggressive maintenance of health and wellness in an outpatient setting, and EMS providers play an integral role in its administrative and operational framework. Secondary benefits of an effective mobile integrated healthcare system include the creation of a closer relationship between a patient and their local healthcare assets and the potential reduction in the need for inpatient care.

On June 30, 2015, the Ohio Revised Code was amended to allow Ohio EMS providers to perform services in non-emergency settings. The new law, Ohio Revised Code 4765.31, created a path for mobile integrated healthcare to exist in Ohio. Per this law, Ohio EMS personnel including, but not limited to, community paramedics, providing non-emergency care must:

1. Function within the Ohio EMS scope of practice that is determined by the State of Ohio Board of Emergency Medical, Fire, and Transportation Services Board (EMFTS Board)
2. Function under the authority of a medical director that meets the qualifications cited in the Ohio Administrative Code 4765-3-05.
While both organizations can offer support, it is not the directive nor is it the desire of the EMFTS Board or the Ohio Department of Public Safety, Division of EMS to be prescriptive or to mandate the structure of a mobile integrated healthcare system. There are several advisories that have been approved by the National EMS Advisory Council and presented to the Federal Interagency Committee on EMS that support key supportive and operational elements related to mobile integrated healthcare such as reimbursement for services provided and the completion of a practice analysis to guide education, provider qualifications, and scopes of practice specific to the specialty.

The foundation of a mobile integrated healthcare system is based solely in the heart of the community. The local healthcare consumers and providers are in the best position to identify the deficiencies in medical resources and access to care. Therefore, a community’s caregivers, consumers, patients, and healthcare stakeholders must unite in a spirit of collaboration to build a mobile integrated healthcare system that fills the existing gaps in medical care delivery and best meets the identified needs. Mobile integrated healthcare is a team sport, and the contributions of allied healthcare professionals, including EMS providers, are essential elements required for creation and launch of a successful system.
Austere environments can be encountered when dispatched to any scene or may unpredictably evolve after arrival on scene. Lessons learned from military experience and historic tragic events in the civilian setting have taught us that the identification and rapid treatment of life-threatening injuries saves lives. The patient treatment measures that were first crafted by the military as Tactical Combat Casualty Care has evolved into the civilian model, Tactical Emergency Casualty Care (TECC) which was created by the Committee on Tactical Emergency Casualty Care (C-TECC). While the TCCC model was primarily based on relatively healthy and young military personnel, the guidelines offered within TECC encompass the needs of the entire population which includes pediatric and geriatric patients and those with co-morbid conditions.

The patient care measures cited within TECC were created for all EMS providers. The use of TECC is not limited to specialty care teams such as rescue task forces or tactical EMS units. TECC can be utilized by all persons who are willing and able to respond, including non-medical personnel such as law enforcement personnel (First Responders with a Duty to Act) and civilians (First Care Providers), to a level appropriate to their respective training and/or scope of practice.

As demonstrated by many events involving austere environments in the civilian setting, the initial effective emergency care is frequently provided by the First Care Provider (formerly known as the bystander or layperson). Their basic actions have been the critical factor in preserving life until EMS arrives and the patient is transported to an appropriate facility for definitive interventions. While the C-TECC has produced guidelines for several levels of responders, the following guidelines were written specifically for those trained and authorized to provide basic or advanced life support. It is important to note that, within an austere environment, the reference to the “patient” and the associated treatment interventions encompasses any injured person on scene including the victim, a fellow EMS professional, law enforcement officer, or alleged perpetrator as well as self-care. In addition, First Care Providers and/or First Responders with a Duty to Act should be tasked to provision of TECC to patients, at the level appropriate with their skill and training, rather than being dismissed upon the arrival of EMS personnel. Additional lives can be saved with their additional manpower and assistance in the provision of basic life-saving TECC measures to patients unless the threat warrants evacuation of the TECC providers from the scene.

The guidelines for patient care by EMS are first driven by definition of the zone in which patient care is needed. These zones are as follows:

- **Hot Zone** – An area of direct or immediate threat
- **Warm Zone** – An area of indirect threat where the site has been cleared by law enforcement personnel, but not secured
- **Cold Zone** – An area where there is no known threat

The current TECC guidelines for rapid life-saving treatment in hot and warm zones, modified to align with the Ohio EMS scope of practice, are cited below. The patient care provided in the cold zone should be the standard traditional care based upon the patient’s injury or illness and the patient’s condition. The vast majority of these patient care measures can be performed by all Ohio EMS providers except where noted due to the parameters of the Ohio EMS scope of practice. All patient care measures require authorization, a written protocol, training, continuing education, and a quality assurance program from the EMS medical director.

**NOTE:** Some commercially available tourniquets exceed the limb circumference of infants and small children. In these cases, the application of direct pressure may be the most effective method of hemorrhage control.
TACTICAL EMERGENCY CASUALTY CARE (Continued)

Direct Threat Care/Hot Zone

1. Mitigate any immediate threat and move to a safer position (e.g. initiate fire attack, coordinate ventilation, move to safe haven, evacuate from an impending structural collapse, etc.).
   a. Recognize that threats are dynamic and may be ongoing, requiring continuous threat assessments.

2. Direct the injured first responder to stay engaged in the operation if able and appropriate.

3. Move patient to a safer position:
   a. Instruct the alert, capable patient to move to a safer position and apply self-aid.
   b. If the patient is responsive but is injured to the point that he/she cannot self-evacuate, a rescue plan should be devised.
   c. If a patient is unresponsive, weigh the risks and benefits of a rescue attempt.
      i. Remote medical assessment techniques should be considered to identify patients who are dead or have apparently non-survivable wounds.
      ii. Rescue attempts should only be initiated on patients with wounds that appear to be survivable.

4. Stop life threatening external hemorrhage with a tourniquet. Consider moving to safety prior to application of the tourniquet depending on the level of immediate threat, severity of the bleeding and the evacuation distance to safety.

5. Apply direct pressure to wound, or direct capable patient to apply direct pressure to own wound and/or (self-apply) own effective tourniquet.
   a. Tourniquet application:
      i. Apply the tourniquet(s) as high on the limb as possible, including over the clothing if present.
      ii. Tighten as much as possible and move to safety.

6. Consider quickly placing patient, or directing the patient to be placed, in a position to protect airway.

Indirect Threat Care/Warm Zone

1. Any injured person or responder with a weapon should have that weapon made safe/secured once the threat is neutralized and/or if mental status is altered.

2. Major Bleeding:
   a. Assess for and control all sources of major bleeding:
      i. If not already done during direct threat/hot zone care, use a tourniquet or an appropriate pressure dressing with deep wound packing (either plain gauze or, if available, hemostatic gauze) to control life-threatening external hemorrhage that is anatomically amenable to such treatment.
         • Tourniquet application: Apply the tourniquet over the clothing as proximal as possible and tighten as much as possible, or if situation allows, consider fully exposing and evaluating the extent of the wound before applying tourniquet directly to the skin 2-3 inches above wound (Do not apply over the joint) and tightening as much as possible.
         • Pressure dressing application: apply directly to the skin after the wound has been packed with either plain or hemostatic gauze to translate the surface pressure exerted by the bandage to the bleeding vessels deep in the wound.
         • For any traumatic total or partial amputation, a tourniquet should be applied in an appropriate location regardless of bleeding.
TACTICAL EMERGENCY CASUALTY CARE (Continued)

ii. If major bleeding is in anatomic junctional area where that bleeding cannot be easily controlled by direct pressure and/or hemostatic dressings, apply a junctional tourniquet device if immediately available.

b. Reassess all tourniquets that were applied during direct threat/hot zone care. Consider checking a distal pulse, or if the situation allows, fully exposing the injury to evaluate the wound for effective hemorrhage control and to determine if the tourniquet is needed.
   i. Tourniquets that are determined to be both necessary and effective in controlling hemorrhage should remain in place if the patient can be evacuated within 2 hours to definitive medical care.
   ii. If existing tourniquet is necessary but ineffective (continued bleeding or a palpable distal pulse), either tighten the existing tourniquet further, or apply a second tourniquet, side-by-side and, if possible, proximal to the first to eliminate the distal pulse.
   iii. If a tourniquet is determined based on wound assessment to not be necessary, use other techniques to control bleeding and remove the tourniquet.

c. Consider tourniquet downgrade or tourniquet conversion if there will be a delay in evacuation more than 2 hours. On any patient who is receiving resuscitation for hemorrhagic shock, ensure a positive response to resuscitation efforts (e.g. improving mentation and peripheral pulses normal in character) before downgrading or converting a tourniquet. Criteria for tourniquet downgrade or conversion:
   • Patient not in hemorrhagic shock
   • Able to subsequently monitor wound closely
   • Tourniquet is not on an amputated or partially amputated limb
   • No prior unsuccessful attempts to remove the tourniquet
   i. Downgrade: Expose the wound fully, identify an appropriate location at least 2-3 inches above the injury (not over a joint), and apply a new tourniquet directly to the skin. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.
   ii. Conversion: Expose the wound fully, fully pack the wound with hemostatic or plain gauze, and properly apply a pressure dressing. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.
   iii. If a tourniquet downgrade/conversion fails, it should not be attempted multiple times.

d. Expose and clearly mark all tourniquet sites with the time of tourniquet application.

3. Airway Management:
   a. If the patient is conscious and able to follow commands:
      i. Allow the patient to assume any position of comfort. Do not force to lie down.
   b. If the patient is unconscious or conscious, has a pulse, is not apneic, but is unable to follow commands:
      i. Clear mouth of any foreign bodies (vomit, food, broken teeth, gum, etc.).
      ii. Apply basic chin lift or jaw thrust maneuver to open airway.
      iii. Consider placing a nasopharyngeal airway.
      iv. Place patient in the recovery position to maintain the open airway.

EMT
c. Consider applying oxygen if available.

PARAMEDIC
d. If previous measures are unsuccessful and equipment is available under an approved protocol, consider:
   i. Extraglottic airway devices
   ii. Orotracheal/nasotracheal intubation
   iii. Surgical cricothyroidotomy (with lidocaine if conscious)
TACTICAL EMERGENCY CASUALTY CARE (Continued)

4. Respirations/Breathing:
   a. All open and/or sucking chest wounds should be treated by immediately applying a vented
      occlusive seal, if available, to cover the defect or leave the wound open.
   b. Monitor any patient with penetrating torso trauma for the development of a subsequent tension
      pneumothorax. The most common presentation will be a penetrating chest injury with subsequent
      progressive dyspnea/respiratory distress, hypoxia and/or hypotension, and/or increasing
      anxiety/agitation, often after the application of an occlusive chest seal.

AEMT
   c. If tension pneumothorax is suspected to be present or developing, decompress the chest on the
      side of the injury. Needle decompression should be performed with, at minimum, a 14-gauge,
      3.25 inch needle/catheter. Potential decompression sites/procedures include:
      i. Anterior decompression: Insert the needle in the 2nd intercostal space at the
         midclavicular line. Ensure that the needle entry into the chest is lateral to the nipple line
         and is not directed towards the heart.
      ii. Lateral decompression: Insert the needle in the 4-5th intercostal space perpendicular to
         the chest wall, anterior to the mid-axillary line on the injured side. This should be done
         only if properly trained and under an approved local protocol.

EMT
   iii. Non-invasive decompression: remove the occlusive dressing and physically “burp” the
        chest seal.

5. Intravenous (IV) Access:

AEMT
   a. If immediate fluid resuscitation is required and is available, consider starting at least an 18-gauge
      IV or obtaining intraosseous (IO) access.

6. Tranexamic Acid (TXA)*

PARAMEDIC
   a. If patient has injuries that could potentially require significant blood transfusion (e.g. presents in
      hemorrhagic shock in the setting of penetrating torso trauma, multiple amputation(s), and/or
      evidence of severe uncontrolled internal or external bleeding) consider administration of TXA as
      soon as possible.
      i. Do not administer TXA later than 3 hours after injury.
      Mix 1 g of TXA in 100 mL of 0.9% Normal Saline and infuse over approximately 10 minutes IV or
         IO. (If given as an IV push, may cause hypotension)
      Pediatric < 12 years: 15 mg/kg IV over 10 mins (max 1 g)
      Pediatric ≥ 12 years: 1 g IV over 10 mins

      Use dedicated IV/IO line if possible and Do NOT administer in the same IV or IO line as blood
      products, factor VIIa, or Penicillin
      During radio report, notify the receiving trauma center that TXA was initiated during transport per
      protocol.
      When transferring care to hospital staff and completing PCR: note the time of injury and time of
      TXA administration.
7. Shock Management/Fluid Resuscitation:
   a. Assess for developing hemorrhagic shock
      i. Altered mental status (in the absence of head injury) and weak or absent peripheral
         pulses are the best austere field indicators of shock.
      ii. If equipment available, assess for abnormal vital signs for age (see pediatric vital signs
          below)
   b. If not in hemorrhagic shock:
      i. Patient may drink if conscious, can swallow, and there is a confirmed delay in evacuation
         to care.
   c. If hemorrhagic shock is present:
      i. Resuscitate using permissive hypotension in the non-head injured patient who has
         sustained penetrating trauma. Administer IV fluid bolus (per agency protocol) to a goal of
         improving mental status, radial pulses, or, if monitoring is available, measured
         SBP>80mmHg or, for infants and younger children, an age-appropriate SBP that
         achieves adequate clinical perfusion. Repeat bolus once after 30 minutes if still in shock.
      ii. If a blood transfusion has been initiated by a nurse or physician on scene, maintain the
          transfusion.
   d. In a patient who has altered mental status due to suspected or confirmed traumatic brain injury,
      avoid any hypotension.
      i. Resuscitate aggressively with fluid boluses to a goal of improving mental status, strong
         peripheral pulses or, if monitoring is available, maintain measured SBP>90-100 mmHg
         or, for infants and younger children, an age-appropriate SBP that achieves adequate
         clinical perfusion.
   e. Prioritize for rapid evacuation any patient with traumatic brain injury or any patient, especially
      those with penetrating torso injury, that is displaying signs of shock.

8. Prevention of Hypothermia:
   a. Minimize patient’s exposure to the elements and subsequent heat loss.
      i. Avoid cutting off or removing clothes unless absolutely necessary for wound evaluation.
      ii. For public safety casualties, keep protective gear on or with the patient if feasible.
   b. Keep the patient covered, warm and dry.
      i. Place the patient onto an insulated surface as soon as possible to decrease conduction
         from cold ground temperatures.
      ii. Minimize exposure to the elements.
      iii. Replace wet clothing with dry if possible.
      iv. Cover the patient with dry blankets, jackets, poncho liners, sleeping bags, commercial
          warming devices or anything that will retain heat and assist in keeping the patient dry.
      v. Warm fluids are preferred if IV fluids are administered.

9. Reassess Patient:
   a. Perform a rapid blood sweep/secondary survey, front and back, checking for additional injuries.
      Tearing or cutting clothing, or otherwise exposing the wound may be necessary.
   b. Inspect and consider dressing known wounds that were deferred for treatment in earlier steps of
      indirect threat care.
c. Consider splinting known/suspected fractures, including the application of pelvic binding devices/techniques for suspected pelvic fractures.

10. Analgesia
a. Provide adequate analgesia as necessary for the patient.
   i. For mild to moderate pain, consider oral non-narcotic medications. Avoid the use of non-steroidal anti-inflammatory medications (e.g. aspirin, ibuprofen, naproxen, ketorolac, etc.) in the trauma patient as these medications interfere with platelet functioning and may exacerbate bleeding.

AEMT
ii. For moderate to severe pain, consider use of narcotic medications (hydrocodone, oxycodone, transmucosal fentanyl citrate, etc.). Sedating medications require an increased level of monitoring
   (a) Have naloxone readily available whenever administering opiates.
   (b) Monitor for adverse effects such as respiratory depression or hypotension. Consider the effect of opioid-induced altered mental status on subsequent operations and required resources.
   (c) Consider adjunct administration of anti-emetic medicines.

11. Burns:
   a. Stop the burning process.
   b. Cover the burn area with dry, sterile dressings and initiate aggressive measures to prevent heat loss and hypothermia.
   c. Facial burns, especially those that occur in closed spaces, are likely associated with inhalation injury. Aggressively monitor airway status and, if available, oxygen saturation in such patients and consider early definitive airway management for respiratory distress, oxygen desaturation, or other signs of inhalational injury (e.g. hoarseness, stridor, throat pain).
   d. Smoke inhalation, particularly in a confined space, may be associated with significant carbon monoxide and cyanide toxicity.
      i. Significant symptoms of smoke inhalation and carbon monoxide toxicity should be treated with high flow oxygen if available.
      ii. Significant symptoms of smoke inhalation and cyanide toxicity should be considered candidates for cyanide antidote administration.
   e. Estimate total body surface area (TBSA) burned to the nearest 10% using the appropriate locally approved burn calculation formula.
      i. If burns are greater than 20% of Total Body Surface Area, fluid resuscitation should be initiated as soon as IV/IO access is established.
      ii. If hypotension is also present, fluid resuscitation as per the guidelines #7. Permissive hypotension resuscitation principles for hemorrhagic shock take precedence over burn resuscitation.
   f. All previously described patient care interventions can be performed on or through burned skin in a burn patient.
   g. Analgesia in accordance with TECC guidelines #10 should be administered.

12. Monitoring:
   a. Apply appropriate monitoring devices and/or diagnostic equipment if available. Obtain and record vital signs.

13. Prepare Patient for Movement:
   a. Consider environmental factors for safe and expeditious evacuation.
   b. Secure patient to a movement assist device when available.
   c. If vertical extraction required, ensure patient is secured appropriately.
14. Communicate with the patient if possible.
   a. Encourage, reassure and explain care.

15. Cardiopulmonary Resuscitation:
   a. CPR within this phase of care for victims of blast, penetrating or blunt trauma who have no pulse, no ventilations, and no other signs of life will likely not be successful and should not be attempted.

PARAMEDIC
   i. Consider bilateral needle decompression for victims of torso or multiple trauma with no respirations or pulse to ensure tension pneumothorax is not the cause of cardiac arrest prior to discontinuation of care.

EMT
   b. In other circumstances, performing CPR may be of benefit and should be considered in the context of the operational situation.

16. Documentation of Care:
   a. Document clinical assessments, treatments rendered, and changes in the patient's status in accordance with local protocol. Forward this information with the patient to the next level of care.

Evacuation Care/Cold Zone

1. Reassess all interventions applied in previous phases of care.
   a. If multi-patient event, perform primary triage per local protocols for priority and destination.

2. Airway Management:
   a. The principles of airway management in evacuation care/cold zone are the same as that in indirect threat care/warm zone with the addition of increased utility of extraglottic airway devices and, for certified Ohio paramedics, definitive airway control with endotracheal intubation.
   b. Consider applying oxygen if available.
   c. If intubated and attached to a mechanical ventilator, consider lung protective strategies and reassess for respiratory decline in patients with potential pneumothoraces.
   d. Consider the mechanism of injury and the need for spinal motion restriction.
      i. Routine spinal immobilization is not recommended and may be harmful for casualties with penetrating trauma.
      ii. Maintain high clinical suspicion for casualties for geriatric patients with blunt trauma.
      iii. Adequate spinal motion restriction may be maintained by keeping the patient calm, coaching of the patient to limit movement and by positioning in a supine position on a firm surface.
      iv. Patients may be clinically cleared under a locally approved selective spinal motion restriction protocol if they have none of the following:
         • Midline cervical spine tenderness
         • Neurologic impairment
         • Altered mental status
         • Distracting injury
         • Intoxication

3. Respirations/Breathing:
   a. All open and/or sucking chest wounds should be treated by immediately applying a vented occlusive seal, if available, to cover the defect or leave the wound open.
TACTICAL EMERGENCY CASUALTY CARE (Continued)

b. Monitor the patient for the potential development of a subsequent tension pneumothorax. Tension pneumothoraces should be treated as in indirect threat care/warm zone.
   i. Symptoms include, but are not limited to, progressive respiratory distress, hypoxia and/or hypotension in the setting of known torso trauma

c. Reassess casualties who have had chest seals applied or had needle decompression. If there are signs of continued or progressive respiratory distress:
   i. Consider repositioning the patient, burping the chest seal. If this results in improved clinical status, the decompression can be repeated multiple times.

PARAMEDIC

ii. Consider repeating the needle decompression. If this results in improved clinical status, the decompression can be repeated as needed.

EMT

d. Administration of oxygen may be of benefit for all traumatically injured patients, especially for the following types of casualties:
   • Low oxygen saturation by pulse oximetry
   • Injuries associated with impaired oxygenation
     ❑ Unconscious patient
     ❑ Patient with traumatic brain injury (maintain oxygen saturation 94-98%)
     ❑ Patient in shock
     ❑ Patient at altitude
     ❑ Patient with known/suspected pneumothorax

4. Major Bleeding:
   a. Assess for any unrecognized or untreated bleeding.
      i. If not already done, use a tourniquet or an appropriate pressure dressing with deep wound packing to control life-threatening external hemorrhage that is anatomically amenable to such treatment.
         • Tourniquet application: Apply the tourniquet directly to the skin 2-3 inches above wound (Do not apply over the joint) and tighten as much as possible.
         • Pressure dressing application: apply directly to the skin after the wound has been packed with either plain or hemostatic gauze to translate the surface pressure exerted by the bandage to the bleeding vessels deep in the wound.
         • For any traumatic total or partial amputation, a tourniquet should be applied in an appropriate location regardless of bleeding.
         • Expose and clearly mark all tourniquets with time of application.
   b. Re-assess effectiveness and clinical indications for all tourniquets that were applied during previous phases of care.
      i. Tourniquets that are determined to be both clinically indicated and effective in controlling hemorrhage should remain in place if the patient can be evacuated within 2 hours to definitive medical care.
      ii. If existing tourniquet is clinically indicated but ineffective (continued bleeding or a palpable distal pulse), either tighten the existing tourniquet further, or apply a second tourniquet, side-by-side and, if possible, proximal to the first to eliminate the distal pulse.
      iii. If a tourniquet is determined based on wound assessment to not be clinically indicated, use other techniques to control bleeding and remove the tourniquet.
c. Consider tourniquet relocation, downgrade, or conversion if there will be a delay in evacuation more than 2 hours. On any patient who is receiving fluid resuscitation (including blood products) for hemorrhagic shock, ensure a positive response to resuscitation efforts (e.g. improving mentation and peripheral pulses normal in character) before downgrading/converting a tourniquet.

Criteria for tourniquet downgrade/conversion:

- Patient is not in hemorrhagic shock
- Able to subsequently monitor wound closely
- Tourniquet is not on an amputated or partially amputated limb
- No prior unsuccessful attempts to remove the tourniquet

i. Downgrade: Expose the wound fully, identify an appropriate location at least 2-3 inches above the injury (not over a joint), and apply a new tourniquet directly to the skin. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.

ii. Conversion: Expose the wound fully, fully pack the wound with hemostatic or plain gauze, and properly apply a pressure dressing. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.

iii. Tourniquet relocation: Expose the wound fully, identify an appropriate location at least 2-3 inches above the injury (not over a joint), and apply a new tourniquet directly to the skin. Once properly applied, the prior tourniquet can be loosened but should be left in place. Assess for bleeding.

iv. If a tourniquet downgrade/conversion fails, it should not be attempted multiple times.

5. Tranexamic Acid:

PARAMEDIC

a. If patient has injuries that could potentially require significant blood transfusion (e.g. presents in hemorrhagic shock in the setting of penetrating torso trauma, multiple amputation(s), and/or evidence of severe uncontrolled internal or external bleeding) consider administration of TXA IV as soon as possible.

i. Do not administer TXA later than 3 hours after the injury.

6. Shock Management / Fluid resuscitation:

a. Reassess for hemorrhagic shock (altered mental status in the absence of brain injury, weak or absent peripheral pulses, and/or change in pulse character). In this phase, BP monitoring should be available. If so, maintain target systolic BP above 80-90 mmHg or, for infants and young children, an age-appropriate systolic BP that achieves adequate clinical perfusion.

AEMT

b. Establish intravenous or intraosseous access if not performed in indirect threat care/warm zone phase.

PARAMEDIC

c. Management of resuscitation as in indirect threat care/warm zone with the following additions:

i. If in hemorrhagic shock and blood products are not available or not approved under scope of practice/local protocols, fluid resuscitate as in indirect threat care/warm zone.

ii. If a blood transfusion has been started by nurse or physician on scene, maintain the transfusion of blood or blood products.

(a) Continue resuscitation as needed to maintain target BP or clinical improvement.
TACTICAL EMERGENCY CASUALTY CARE (Continued)

d. In a patient who has altered mental status due to suspected or confirmed traumatic brain injury, avoid any hypotension.
   i. Resuscitate aggressively with fluid boluses to a goal of improving mental status, strong peripheral pulses or, if monitoring available, maintain measured SBP>90-100 mmHg or, in infants and young children, an age-appropriate SBP that achieves adequate clinical perfusion.

EMT

   ii. Position patient with head elevated 30 degrees if possible.

7. Prevention of Hypothermia:
   a. Minimize patient's exposure to the elements. Move into a medic unit, vehicle, or warmed structure if possible. Avoid cutting off or removing clothes unless necessary for wound exposure.
      i. For public safety casualties, keep protective gear on or with the patient if feasible.
   b. Replace wet clothing with dry if possible.
   c. Place the patient onto an insulated surface as soon as possible to decrease conductive heat loss to the cold ground.
   d. Cover the patient with dry blankets, jackets, poncho liners, sleeping bags, commercial warming devices or anything that will retain heat and keep the patient dry.
   e. Warm fluids are preferred if IV fluids are required.

8. Monitoring
   a. Institute electronic monitoring if available, including pulse oximetry, cardiac monitoring, end-tidal CO2, and blood pressure.
   b. Obtain and record vital signs.

9. Reassess Patient:
   a. Complete secondary survey checking for additional injuries. Inspect and dress known wounds that were previously deferred.
   b. Determine mode and destination for evacuation to definitive care.
   c. Splint known/suspected fractures and recheck pulses.
   d. Apply pelvic binding techniques or device for suspected unstable pelvic fractures.

10. Provide Analgesia as Necessary:
    a. Provide adequate analgesia as necessary for the casualties:
       i. Have naloxone readily available whenever administering opiates.
       ii. Monitor for adverse effects such as respiratory depression or hypotension. Consider the effect of opioid-induced altered mental status on subsequent operations and required resources.
       iii. For mild to moderate pain, consider oral non-narcotic medications. Avoid the use of non-steroidal anti-inflammatory medications (e.g. aspirin, ibuprofen, naproxen, ketorolac, etc.) in the trauma patient as these medications interfere with platelet functioning and may exacerbate bleeding.

AEMT

    iv. For moderate to severe pain, consider use of narcotic medications (hydrocodone, oxycodone, transmucosal fentanyl citrate, etc.). Sedating medications require increased level of monitoring.
    v. Consider adjunct administration of anti-emetic medicines.
TACTICAL EMERGENCY CASUALTY CARE (Continued)

11. Burns:
   a. Burn care and resuscitation is consistent with the principles described in indirect threat care/warm zone.
   b. Smoke inhalation, particularly in a confined space, may be associated with significant carbon monoxide and cyanide toxicity.
      i. Significant symptoms of smoke inhalation and carbon monoxide toxicity should be treated with high flow oxygen if available.
      ii. Significant symptoms of smoke inhalation and cyanide toxicity should be considered candidates for cyanide antidote administration.
   c. Be cautious of off-gassing from patient in the evacuation vehicle if there is suspected chemical exposure (e.g. cyanide) from the fire.
   d. Consider early airway management if the patient has signs of significant airway thermal injury (e.g. oral edema, hoarseness, stridor, throat pain, carbonaceous material in the posterior pharynx and respiratory difficulty) or if there is a prolonged evacuation period.

12. Traumatic Brain Injury (TBI):
   a. Prevention of hypotension and hypoxia are critical in management of TBI.

   PARAMEDIC
   b. TBI patients should have available monitoring equipment applied and should be resuscitated to a minimum SBP > 90-100 mmHg or, in infants and young children, an age-appropriate SBP that achieves adequate clinical perfusion.

   EMT
   c. Raise the head of the bed or stretcher 30 degrees if patient is not in hemorrhagic shock.

13. Prepare Patient for Movement:
   a. Consider environmental factors for safe and expeditious evacuation.
   b. Secure patient to a movement assist device when available.
   c. If vertical extraction required, ensure patient secured appropriately.

14. Communicate with the patient if possible and with the receiving facility.
   a. Encourage, reassure and explain care to patient.
   b. Notify receiving facility of wounds, patient condition, and treatments applied.

15. Cardiopulmonary Resuscitation:
   a. CPR may have a larger role during the evacuation phase especially for patients with electrocution, hypothermia, non-traumatic arrest or near drowning.

   PARAMEDIC
   b. Consider bilateral needle decompression for victims of torso or multiple trauma with no respirations or pulse to ensure tension pneumothorax is not the cause of cardiac arrest prior to discontinuation of care.
16. Documentation of Care:
   a. Continue or initiate documentation of clinical assessments, treatments rendered, and changes in
      the patient’s status in accordance with local protocol.
   b. Forward this information with the patient to the next level of care.

*NOTE: EMS medical directors who elect to include the administration of tranexamic acid within
an EMS protocol should do so with engagement of and collaboration with their respective local or
regional trauma system network and colleagues. To achieve the maximal efficacy of this
medication, patients who receive tranexamic acid in the prehospital setting should be transported
to a trauma center that also includes this medication as an option within the facility’s hemorrhage
control protocols and have the capability and resources to administer a tranexamic acid infusion.
NORMAL PEDIATRIC VITAL SIGNS

<table>
<thead>
<tr>
<th>Age</th>
<th>Pulse</th>
<th>Respiratory Rate</th>
<th>Systolic BP*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm &lt; 1 kg</td>
<td>120-160</td>
<td>30-60</td>
<td>36-58</td>
</tr>
<tr>
<td>Preterm 1 kg</td>
<td>120-160</td>
<td>30-60</td>
<td>42-66</td>
</tr>
<tr>
<td>Preterm 2 kg</td>
<td>120-160</td>
<td>30-60</td>
<td>50-72</td>
</tr>
<tr>
<td>Newborn</td>
<td>126-160</td>
<td>30-60</td>
<td>60-70</td>
</tr>
<tr>
<td>Up to 1 year</td>
<td>100-140</td>
<td>30-60</td>
<td>70-80</td>
</tr>
<tr>
<td>1-3 years</td>
<td>100-140</td>
<td>20-40</td>
<td>76-90</td>
</tr>
<tr>
<td>4-6 years</td>
<td>80-120</td>
<td>20-30</td>
<td>80-100</td>
</tr>
<tr>
<td>7-9 years</td>
<td>80-120</td>
<td>16-24</td>
<td>84-110</td>
</tr>
<tr>
<td>10-12 years</td>
<td>60-100</td>
<td>16-20</td>
<td>90-120</td>
</tr>
<tr>
<td>13-14 years</td>
<td>60-90</td>
<td>16-20</td>
<td>90-120</td>
</tr>
<tr>
<td>15 years and older</td>
<td>60-90</td>
<td>14-20</td>
<td>90-130</td>
</tr>
</tbody>
</table>

*Blood pressure is a late and unreliable indicator of shock in children

PEDIATRIC GLASGOW SCALE SCORING TOOL

<table>
<thead>
<tr>
<th>Glasgow</th>
<th>Glasgow Modified for Infant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye opening</strong></td>
<td></td>
</tr>
<tr>
<td>Spontaneous</td>
<td>Spontaneous</td>
</tr>
<tr>
<td>To voice</td>
<td>To voice</td>
</tr>
<tr>
<td>To pain</td>
<td>To pain</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>Verbal response</strong></td>
<td></td>
</tr>
<tr>
<td>Oriented</td>
<td>Coos, babbles</td>
</tr>
<tr>
<td>Confused</td>
<td>Irritable cry, inconsolable</td>
</tr>
<tr>
<td>Inappropriate</td>
<td>Cries to pain,</td>
</tr>
<tr>
<td>Garbled speech</td>
<td>Moans to pain</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>Motor response</strong></td>
<td></td>
</tr>
<tr>
<td>Obeys commands</td>
<td>Normal movements</td>
</tr>
<tr>
<td>Localizes pain</td>
<td>Withdraws to touch</td>
</tr>
<tr>
<td>Withdraws to pain</td>
<td>Withdraws to pain</td>
</tr>
<tr>
<td>Flexion</td>
<td>Flexion</td>
</tr>
<tr>
<td>Extension</td>
<td>Extension</td>
</tr>
<tr>
<td>Flaccid</td>
<td>Flaccid</td>
</tr>
</tbody>
</table>

* Motor response is most indicative of level of injury