Utah EMS Protocol Guidelines

September 2025

The Utah EMS Protocol Guidelines were developed to provide EMS agencies with clear, evidence-based treatment protocols. Created by physicians, EMS medical directors, and frontline providers, these guidelines reflect current best practices in prehospital care.

Use of the guidelines is voluntary but encouraged. Agencies may adopt them as written or use them as a foundation for their own protocols. Widespread adoption helps ensure consistent care across the state, supports coordination with hospitals, and improves patient outcomes.

The guidelines are reviewed and updated regularly. Feedback from EMS professionals is welcomed and appreciated.

All EMS personnel should follow the "All Providers" section, regardless of their scope of practice. Each licensure level—EMR, EMT, AEMT, and Paramedic—also has specific protocols. If a licensure level is not listed for a particular guideline, there are no additional considerations for that level.

Providers are expected to follow protocols for their level and for all preceding levels. For example, Paramedics follow their own protocols as well as those for AEMTs, EMTs, and EMRs.

Table of Contents

Guideline Changes Since Publication

Date	Guideline	Change
9/22/2025	Nausea & Vomiting	Error with AEMT and Paramedic medication administration
	SMR	Error added guideline
9/30/2025	Fever Management	Error with AEMT and Paramedic medication administration
11/21/2025	Fever Management & Pain Management	Error with EMT and AEMT medication
	AMS, Cardiac Arrest, Opioid Overdose	Clarified naloxone discrepancies
	Cardiac Arrest	AEMT - removed lidocaine drip
	All applicable Pediatric guidelines	Clarified epi dosage max
12/29/2025	Avalanche	Updated avalanche algorithm diagram

Utah State FSED (Freestanding Emergency Departments)

Free Standing Emergency Centers as an Ambulance Destination:

Free-standing Emergency Departments (FSEDs) are extensions of tethered Hospital Emergency Departments. These facilities are manned by Board-Certified Emergency Physicians and Emergency nurses, the same ones you will see at the tethered Hospital Emergency Departments. However, because they are "Free-Standing" and not part of a full hospital, there are some limitations in the care that can or should provide at these locations.

The facility limitations may affect your more critical patients and require additional consideration to ensure they arrive at the most appropriate destination.

The staff at the FSEDs are more than happy to take your call and help with the destination decision. Just realize that sometimes it is best to bypass the FSED.

Bypassing a FSED Indications:

1. Trauma: Any patient meeting level 1 or 2 trauma activation criteria (Red or Yellow Trauma Criteria) should bypass an FSED for a trauma center. Trauma Arrests should also bypass FSEDs. Crews are always welcome to stop in for help securing an airway and/or other critical stabilization. Trauma patients at the FSED who need to be admitted will be moved to a trauma center as soon as possible.
2. Cardiac: Unless stabilization is needed, suspected cardiac emergencies, specifically STEMIs, should bypass the FSEDs and be taken to a facility with a Cardiac Cath Lab. At the same time, stable patients with a complaint of "chest pain" who do not have a STEMI, or serious arrhythmia, can easily be evaluated at an FSED.
3. Pregnancy: Unless a precipitous birth is imminent or stabilization is required before going to a main ED facility, any pregnancy problem in a pregnancy greater than 16 weeks or with unstable vital signs, including newborn children and their mothers, should be taken to a full hospital with a Labor and Delivery area.
4. Behavioral Health patients with Agitation should be taken to a full Hospital Emergency Department. A good general rule is that if you or the police have any difficulties managing the patient in the field, they should go to the Main ED in a Full Hospital.

Special Considerations:

1. Stroke: Stroke treatment is extremely time sensitive – "time is brain". The FSEDs can obtain a CT scan and a CT angiogram of the head and neck, identifying the type of stroke and quickly administering thrombolytics, if indicated. All confirmed stroke patients will require transfer to an appropriate stroke center based on the patient findings. Consider transport to thrombectomy-capable stroke center or comprehensive stroke center for Cincinnati Stroke Scale (CSS) 3-4 and time since Last Known Well (LKW) 4-24 hours as per ***SUSPECTED STROKE*** guideline.

General Patient Care Guidelines

These guidelines were created to provide direction to each level of certified provider in caring for all types of patients. All of these directions, dosages and provisions are subject to change with a later notice or revision of the guidelines. The OLMC physician will always be the final word on treatment in the field. If there are ever any discrepancies between the guidelines and the OLMC physician these should be documented and brought to the attention of the physician at the receiving hospital. If the explanation is not sufficient, the provider should bring the issue to their medical director or BEMS for review.

General Approach to General Patient Care Guidelines

- Assess your patient prior to initiating a guideline.
- More than one guideline may apply.
- If conflicts arise between treatment guidelines → contact OLMC for clarification.
- Providers may provide treatment up to the level of their certification only, unless acting under a specific variance approved by the State.
- Air Medical Transport Service personnel function under their own clinical guidelines.
- Contact the receiving hospital and OLMC as soon as clinically possible for each patient.
- OLMC physician may change your treatment plan, but cannot authorize treatments or procedures outside of your scope of practice.
- Any variations to a guideline by the OLMC or physician should be clarified to ensure that the provider has properly characterized the situation.
- The OLMC Physician has the final word on treatment once contact is made.
- OLMC physician must approve usage of dosages in excess of the guideline.
- Some Patients may have individualized treatment plans approved by their physician. If the patient's written emergency treatment plan has medications not in protocol → please consult with online medical control.
- The order in which medications of the same class are listed is not intended to indicate hierarchy, order, or preference of administration.

General Pediatric Considerations

- Pediatric reference for obtaining kg weight, based on age or length should be used to determine dosages for infants and children.
- Pediatric lowest acceptable systolic blood pressures are: birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

✆ This symbol and yellow highlighted instructions precedes any treatment that requires OLMC prior to initiating the treatment unless otherwise specified.

OLMC should be contacted for dosages above those provided, need for ongoing sedation, or use of medication NOT fitting the guideline parameters.

If there is a prolonged inability to contact OLMC due to communications failure → proceed as per best judgement of the treating crew.

AIRWAY MANAGEMENT

ALL PROVIDERS

❑ Focused history and physical exam
- Assess ABC's for evidence of current apnea, airway reflex compromise or difficulty in ventilatory effort.
- Assess medical conditions, burns or traumatic injuries that may have or will compromise the airway.

❑ Continuous cardiac monitoring; end-tidal CO_2 ($ETCO_2$), blood pressure, and pulse oximetry, when available
- Obtain a 12-lead EKG when available

TREATMENT PLAN
- Provide basic airway maneuvers to all compromised airways, i.e. jaw-thrust, airway adjuncts (nasal and oral airway), and oxygen.
- Identify and treat underlying reversible medical conditions (narcotic overdose, hypoglycemia, etc.).
- Provide supplemental oxygen and assisted ventilation as needed for the patient to maintain an oxygen saturation 90-94% and $ETCO_2$ of 35-45.
- Always ensure proper care of the C-spine during airway treatment
- Keep NPO. Stop any GI Feedings and do not use GI tube during resuscitation except to vent tube if assisted ventilations being delivered
- BVM is the preferred method of ventilation <10 years old.
- **Suctioning**
  - Infants and young children require a clear nose for effective breathing. Suctioning oral and nasal passages are essential in management in respiratory distress
  - Using an 8Fr soft catheter, clear each nostril (suction for less than 10 seconds per nare)
  - If distress persists → lubricate the nare with 1-2 drops of saline and suction to the depth of the tip of the child's nose to their ear lobe.
  - Suction while withdrawing, use a twisting motion, for less than 10 seconds

ADULT

EMR

❑ Pulse oximetry monitoring

❑ Ventilate with BVM when apneic or exhibiting respiratory distress. Consider an airway adjunct when not contraindicated (facial fractures, intact gag response, etc).

❑ Avoid hyperventilation and maintain a ventilatory rate of 10-12 breaths per minute.

❑ Ventilate with BVM when apneic or exhibiting respiratory distress. Consider an airway adjunct when not contraindicated (facial fractures, intact gag response, etc).

EMT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

❑ Pulse oximetry monitoring

❑ Ventilate with BVM when apneic or exhibiting respiratory distress. Consider an airway adjunct when not contraindicated (facial fractures, intact gag response, etc).

❑ Avoid hyperventilation → recommended pediatric ventilatory rates:
- Infant (0-12 month): 25 breaths per minute
- 1-3 yrs: 20 breaths per minute
- 4-6 yrs: 15 breaths per minute

EMT

AEMT

- ❑ If unable to ventilate with BVM → consider an appropriately-sized supraglottic airway device
  - Document confirmation via $ETCO_2$ waveform capnography and lung sounds.
  - Monitor continuous $ETCO_2$, reassess advanced airway placement with any change.
- ❑ **CPAP/BiPAP** – Consider when the patient is awake but needs assistance with oxygenation and ventilation such as in a CHF/pulmonary edema patient or COPD patient.
  - ○ If unable to adequately ventilate → return to BVM and consider insertion of supraglottic airway device and bag ventilation.
  - Explain the procedure to the patient
  - Initially apply the mask and begin the CPAP or BiPAP according to manufacturer instructions.
- ❑ **High Flow Nasal Cannula (HFNC)** – Consider when the patient is awake but needs assistance with oxygenation and ventilation such as in a CHF/pulmonary edema patient or COPD patient.
  - ○ If unable to adequately oxygenate → return to BVM and consider insertion of supraglottic airway and bag ventilation.
  - Explain the procedure to the patient
  - Initially apply the nasal cannula device and begin flow according to manufacturer instructions.

✆ Contact OLMC to discuss further settings and treatment above the initial setup.

PARAMEDIC

ENDOTRACHEAL INTUBATION

- ❑ Consider orotracheal intubation using an endotracheal tube (ETT) when indicated
  - Video laryngoscopy is the preferred method for achieving ET intubation.
  - Document confirmation via $ETCO_2$ waveform capnography and document lung sounds. Secure the ETT for transport.
  - Consider NG/OG tube placement or opening active G-tubes for all intubated patients
  - Consider sedation after intubation.
  - If endotracheal intubation is unsuccessful → revert to a supraglottic airway device or BVM with appropriate oral/nasal airway. Avoid multiple attempts at intubation.

AEMT

- ❑ If unable to ventilate with BVM → consider an appropriately-sized supraglottic airway device
  - Document confirmation via $ETCO_2$ waveform capnography and lung sounds
  - Monitor continuous $ETCO_2$, reassess advanced airway placement with any change.
- ❑ **CPAP/BiPAP** – Only use when the patient is on the machine at home. Maintain home settings and bring the machine with the patient.
  - ○ If unable to adequately ventilate → return to BVM and consider insertion of a supraglottic airway device.
- ❑ **High Flow Nasal Cannula (HFNC)** – Consider when the patient is awake but needs assistance with oxygenation and ventilation.
  - ○ If unable to adequately oxygenate → return to BVM and consider insertion of supraglottic airway device and bag ventilation.
  - Explain the procedure to the patient/parent
  - Initially apply the nasal cannula device and begin flow according to manufacturer instructions.

PARAMEDIC

ENDOTRACHEAL INTUBATION

- ❑ Consider orotracheal intubation using an endotracheal tube (ETT) when indicated
  - Video Laryngoscopy is the preferred method for achieving ET intubation.
  - Document confirmation via $ETCO_2$ waveform capnography and document lung sounds. Secure the ETT for transport.
  - BVM ventilations are the preferred method of ventilation in children, even for long transports. However, if oxygenation or ventilation is inadequate with BVM → a trial of a supraglottic airway device is indicated. In the rare instance that a supraglottic airway device is ineffective, then proceed to ETT.

- For longer transports, be aware of gastric distension during BVM, which may limit ventilation. An NG/OG tube with either continuous or intermittent suction can be placed to decompress the stomach.
- Pediatric ETT's are sized according to age or pediatric reference guide. Formula [(age+16)/4] can be substituted in lieu of reference guide.
- Document confirmation via $ETCO_2$ waveform capnography and document lung sounds.
- Secure the ETT for transport.
- Use continuous $ETCO_2$ during transport.
- Consider sedation after intubation.
- If endotracheal intubation is unsuccessful → revert to a supraglottic airway device or BVM with appropriate oral/nasal airway. Avoid multiple attempts at intubation.

SURGICAL AIRWAY - CRICOTHYROTOMY

❑ Consider only when all other methods of oxygenation, ventilation and securing the airway have failed.
- Document successful placement with **TWO** confirmations via $ETCO_2$ waveform capnography and document lung sounds.
- Gather all equipment before beginning the procedure.
- Once the procedure is done insert a 5.0 or 6.0 cuffed ETT, inflate cuff, and secure.

SURGICAL AIRWAY - CRICOTHYROTOMY

❑ Consider only when all other methods of oxygenation, ventilation and securing the airway have failed.
- Open Surgical Cricothyrotomy is contraindicated in ages <12 years old.
- Needle Cricothyrotomy can be used <12 years of age.
- Document successful placement with **TWO** confirmations via $ETCO_2$ waveform capnography and document lung sounds.
- Gather all equipment before beginning the procedure.
- Once the procedure is done and placement is confirmed, insert an appropriately sized cuffed ETT then secure.

✆ Contact OLMC to discuss further instructions as needed.

ALTERED MENTAL STATUS

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Blood glucose, oxygen saturation and temperature assessment
- ❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure, and pulse oximetry, when available
  - Obtain a 12-lead EKG when available
- ❑ Gather and collect any evidence on scene that may assist in the treatment of the patient (medication bottles, pills, notes, etc.)

TREATMENT PLAN

- Treat for trauma per ***TRAUMA PATIENT CARE*** guideline.
- If hypoglycemia/hyperglycemia present → treat per ***HYPOGLYCEMIA / HYPERGLYCEMIA*** guideline.
- Treat for stroke and score per the ***SUSPECTED STROKE*** guideline.
- Treat for possible overdose, substance abuse or other potential toxin exposure. Evaluate the scene for supportive evidence. Treat per ***OPIOID / OVERDOSE*** guideline.

KEY POINTS/CONSIDERATIONS

- ❑ Consider non-accidental trauma, especially in pediatric and elderly patients
- ❑ Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.
- ❑ If poisoning is suspected → you may contact Utah Poison Center at 1-800-222-1222 for guidance.
- ❑ When evaluating pediatric level of consciousness use **A.V.P.U.** Alert, Verbal, Pain, Unresponsive

AEIOU TIPPS: Possible causes of Altered Mental Status

A– Alcohol	**T** – Trauma/Temp
E – Electrolytes	**I** – Infection
I – Insulin	**P** – Psychogenic
O – Opiates	**P** – Poison
U – Uremia	**S** – Shock/Seizure

ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

- ❑ Pulse oximetry monitoring
- ❑ Apply supplemental oxygen as needed to maintain oxygen saturation of 90-94%
- ❑ **Naloxone** for suspected narcotic overdose. Reference *OPIOID OVERDOSE* guideline.

EMT

- ❑ Apply warming or cooling techniques as indicated
- ❑ Consider restraints as needed to protect the patient and/or rescue personnel
- ❑ **Naloxone** for suspected narcotic overdose. Reference *OPIOID OVERDOSE* guideline.

AEMT

- ❑ **Naloxone** 0.4–2 mg (per dose) IV/IM/IO/IN for suspected narcotic overdose. May repeat as needed.

- ❑ **Naloxone** 0.1 mg/kg (max 2 mg per dose) IV/IM/IO/IN for suspected narcotic overdose. May repeat as needed.

PARAMEDIC

- ❑ **Naloxone** 0.4–4 mg (per dose) IV for suspected narcotic overdose. May repeat as clinically indicated.
- ❑ Consider chemical restraints per the ***BEHAVIORAL EMERGENCY*** guideline, as needed, to protect the patient and/or rescue personnel.

PARAMEDIC

- ❑ **Naloxone** 0.4–4 mg (per dose) IV for suspected narcotic overdose. May repeat as clinically indicated.
- ❑ If evidence of poor perfusion → give sodium chloride (NS) 20mL/kg IV once (max 1 liter)
- ❑ Consider chemical restraints per the ***BEHAVIORAL EMERGENCY*** guideline, as needed, to protect the patient and/or rescue personnel.

BLOOD PRODUCT TRANSFUSION

ALL PROVIDERS

Prioritize control of massive hemorrhage prior to initiation of blood transfusion.

- ❑ Continue critical protocol-specific treatments related to source of hemorrhage (i.e. OB emergencies, trauma)
- ❑ Continuous cardiac monitoring; $ETCO_2$, and pulse oximetry, when available
- ❑ Ensure adequate personnel are on scene to appropriately manage concurrent priorities.

TREATMENT PLAN

- Document full set of vitals prior to initiating transfusion (include HR, BP, SpO_2, $ETCO_2$, RR, temp)
- Patient will require patent IV or IO dedicated to blood product administration
- **Preparation of blood product:**
  - Only remove blood products from cooler immediately prior to transfusion.
  - Ensure that the temperature indicator on the blood product bag indicates appropriate temperature storage. If the product has reached inappropriate temperature storage → do not transfuse product
  - Gently agitate blood product. Using the in-line warming system, set up and prime line.
  - Perform medication cross-check before starting transfusion.

KEY POINTS/CONSIDERATIONS

- ❑ Contraindications: Personal or religious objection to receiving blood products
- ❑ Closely monitor for signs of transfusion reaction. Clinical evidence of transfusion reactions may include anaphylaxis, fever, rash, or unexplained abdominal or back pain
  - **If the patient develops transfusion reaction:**
    - Immediately stop blood product transfusion
    - Replace blood product bag and tubing with a new isotonic crystalloid bag and tubing
    - Refer to ***ANAPHYLAXIS/ALLERGIC REACTION*** guideline
    - Notify receiving facility as well as OLMC before returning to service

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
	EMT	
	AEMT	

PARAMEDIC

SIGNS OF INTERNAL OR EXTERNAL HEMORRHAGE AND CLINICAL EVIDENCE OF HEMORRHAGIC SHOCK:

- ❑ Consider shock in patients with one or more of the following:
  - Pale/cool/clammy skin signs
  - Delayed capillary refill
  - Altered, lethargic or irritable
  - Adult vital signs:
    - HR >110
    - SBP <90 or MAP <65
    - $ETCO_2$ <25 mmHg
    - Shock Index >1
      - SI = HR ÷ SBP
- ❑ **Blood Product:** Administer 1 unit of blood product. If available, additional units may be administered until a sustained MAP >65 and/or clinical evidence of adequate systemic perfusion.

PARAMEDIC

SIGNS OF INTERNAL OR EXTERNAL HEMORRHAGE AND CLINICAL EVIDENCE OF HEMORRHAGIC SHOCK:

- ❑ Consider shock in patients with one or more of the following:
  - Pale/cool/clammy skin signs
  - Delayed capillary refill
  - Altered, lethargic or irritable
  - Pediatric vital signs:
    - Tachycardia, tachypnea or hypotension relative to age-based or broselow tape vital signs ranges
- ❑ **Blood Product:** Administer 10 cc/kg.

✆ If hypotension and/or clinical evidence of shock persists → contact OLMC.

DEATH DETERMINATION & TERMINATION OF RESUSCITATION

ALL PROVIDERS

❑ General Crime Scene Management Principles as appropriate.

TREATMENT PLAN

- **EMS may withhold initiation of resuscitation when:**
  - Bodily injury or condition incompatible with life such as:
    - Obvious death, decomposition, and/or rigor mortis
    - Obvious fatal wounds without signs of life
    - Dependent lividity
  - Any patient who is apneic, pulseless, and has an initial rhythm of asystole who also:
    - Had an unwitnessed arrest AND an estimated time interval of >15 minutes from collapse to the initiation of CPR
    - Could not have resuscitation started within 15 minutes of arrest due to scene difficulties such as extrication, location, or unsafe environment
    - Is a patient in a multi-victim incident where insufficient resources preclude initiating resuscitative measures
    - Is a drowning victim with a reasonably determined submersion time of >one (1) hour prior to exam (exemption: very cold water immersion <60°F (<15°C)
    - Experienced a *traumatic arrest* AND all signs of life are absent, including pupillary reflexes, spontaneous movement, response to pain, spontaneous respirations, or organized electrical activity on the cardiac monitor.
  - Written or verbal orders that request no resuscitation:
    - A verbal order by a licensed physician in the State of Utah who is present on scene pronouncing the patient dead
    - A verbal order by the OLMC physician
    - A Do Not Resuscitate (DNR) written order, bracelet, or necklace from any U.S. state.
      - Ensure confirmation of patient's identifying information before ending care
    - A signed Physician/Provider Order for Life-Sustaining Treatment (POLST) form from any U.S. state indicating that the patient does not desire resuscitative efforts
    - Immediate family members request honoring the patient's wishes to NOT start CPR, AND has had a known chronic or terminal illness, WITH the full agreement of all relatives AND EMS personnel on scene AND with concurrence of OLMC. If EMS is uncomfortable with the request → then resuscitative efforts should be started
    - OLMC should be consulted for any difficult or questionable case
- **Termination of CPR** may be done in any or all of the following circumstances with the concurrence of OLMC:
  - A minimum duration of professional resuscitative efforts of 20 minutes for non-shockable rhythms & 40 min for shockable rhythms (not including bystander CPR)
  - A valid DNR or POLST form is discovered after resuscitative efforts were initiated
  - Resuscitative efforts were initiated when criteria to not resuscitate were present (as above)
  - A verbal order pronouncing the patient dead by a licensed physician in the state of Utah who arrives on scene
  - Adult cardiac arrest - resuscitation attempts may be terminated if ALL of the following criteria are met:
    - Arrest was not witnessed by EMS personnel
    - No shockable rhythm was identified at any time during the resuscitation
    - No ROSC occurred at any time during the resuscitation

✆ Contacting OLMC for approval prior to termination of resuscitation efforts is recommended.

KEY POINTS/CONSIDERATIONS

✆ There will always be patients and circumstances that deserve special consideration (pediatric drowning or pregnant patients for instance). OLMC should be consulted if there are ever any questions. Always be sensitive to the patient's desires, family concerns, and on-scene environment to insure an understanding by all who observe your actions that everything that could and should have been done to resuscitate the patient was done.

SPECIAL CONSIDERATIONS FOR RESUSCITATION

❑ **Pediatrics:** Consider transporting pediatric arrests to the hospital after necessary on-scene interventions with ongoing resuscitative efforts en-route, unless it is an obvious death on scene.

❑ The following situations should prompt consideration for hospital transport and/or prolonged resuscitation attempts:
- Environmental Hypothermia
- Drowning
- Electrocution or Lightning Strike

FAMILY CENTERED CARE

ALL PROVIDERS

❑ Family Centered Care is a mutually collaborative health care effort between family, patient and provider and has proven to be the gold standard in dealing with the pediatric patient and their families.
❑ Demonstration of Family Centered Care is by one's actions and behaviors when caring for patients.

TREATMENT PLAN

- Family centered care is demonstrated in practice, not just policy development.
  - Collaboration with Families: Empower the patient and the family by involving them in the care as well as the decision-making process.
  - Cultural Competency: Respect, sensitivity, and an understanding of the unique cultural and religious differences.
    - Be aware of any language barriers.
    - If at all possible, engage an interpreter that is able to understand some of the emotional issues as well as medical terminology associated with the patient.
    - An understanding of the hierarchy of the family is key to a positive outcome.
  - Developmental Competency: Use appropriate language for age.
    - When in pain or hurt children often regress to childhood issues or more infantile responses. They may still need attachment items late in life.
    - Describe what you will be doing.
    - Use eye contact and touch when appropriate.
    - Be respectful at all times.
- **Infants**: General calming measures (Soft voices, gentle pats, pacifiers or rocking), allowing parents to stay close and bonded with the child and help them to anticipate the situation if possible.
- **Toddlers**: Use toys, teddy bear, blanket, etc. for comfort. Parents or family members are often a great source of comfort and nurturing, so allow them to be present.
- **School Age**: Attachment objects, honesty about procedures, and imaginary/magical (e.g. "I made the car crash," "I told a lie, and this is why mom is hurt") perspective of young children. Include the child in conversations about his/her treatment when possible.
- **Adolescents**: Physician and provider honesty is key as well as paying attention to pain. Help them to participate in their own care and take their views seriously. Focus on giving them some sense of control. Pain management is important. Adolescents as well as adults are afraid of pain. The anticipation of pain can be worse than the pain itself. Some transitional objects/toys/stuffed animals can also be useful. Respect their privacy and modesty as much as possible. Allow them to discuss what is happening both with and without caregivers around.
- **Children with Special Health Care Needs**
  - Focused history and physical exam
    - Blood glucose, core body temperature and oxygen saturation assessment.
    - Obtain vital signs – consider discussing patient's baseline vital signs with parents/guardian
    - Continuous cardiac monitoring; $ETCO_2$, and pulse oximetry, when available.
  - Treatment Plan
    - Do not become overwhelmed by equipment used by the patient.
    - Focus on ABC's and ask parents and caregivers for guidance with patient's equipment.
  - Common equipment issues for children with special healthcare needs:
    - Feeding Tube:
      - Most common EMS complaints; tube has come out, is blocked, is leaking, or skin site has unusual drainage or bleeding.
      - If draining or bleeding → apply sterile dressing and use pressure.
      - If tube is malfunctioning or displaced → assess for dehydration and treat per ***SHOCK, SEPSIS, & FLUID THERAPY*** guideline. Do not try to replace or remove the tube.
      - Keep patient NPO and nothing per feeding tube.
      - If a percutaneous (through the skin) G-tube has come out → place an 8Fr suction catheter in the stoma 2-3 inches to prevent full site closure.
    - Tracheostomy and Ventilator/BiPAP:
      - For tracheostomy care refer to the ***AIRWAY*** and/or ***TRACHEOSTOMY MANAGEMENT*** guidelines

- Assess ventilation:
  - ➢ If the ventilator is working properly, and the patient needs transport for non-respiratory medical evaluation → keep on ventilator/BiPAP for transport.
  - ➢ If ventilator is not working or child is in respiratory distress → remove from ventilator and assist ventilations via trach tube with BVM and O_2. Target SpO_2 between 94-99%
- Oral, nasal, and tracheostomy suctioning to remove copious secretions as needed.

■ External Central IV Line (Broviac/PICC etc.):

- Do NOT use the central line for administration of anything.
- Most common EMS complaint: line has come out, is broken, leaking, blocked or skin site has unusual drainage or bleeding.
- This is a direct line to the central venous system.
  - ➢ If the tube is leaking or broken → clamp line above the damaged point, cover the opening with a sterile gauze and transport.
  - ➢ If the line has come out completely, or the site is draining or bleeding → cover with a sterile gauze and apply pressure.

KEY POINTS/CONSIDERATIONS

❑ Family Centered Care = compassion

❑ Include family members in resuscitation and care decision making as they desire and are capable. If possible, designate a crew member to be a liaison to the family in order to facilitate communication and continuity.

NAUSEA & VOMITING

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Blood glucose, oxygen saturation and temperature assessment
- ❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure, and pulse oximetry, when available.

TREATMENT PLAN

- Nothing by mouth (NPO)
- Place the patient in an upright or lateral recumbent position
- Treat for chest and abdominal pain
- Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

ADULT	PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring ❑ Isopropyl alcohol swab inhalation (smelling)	
EMT	**EMT**
❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure ❑ **Ondansetron** 4mg ODT	
AEMT	**AEMT**
❑ Vascular access and fluid therapy ❑ Document level of consciousness before and after giving medication ❑ **Ondansetron** 4mg-8mg IV/IM/PO ❑ **Promethazine** 12.5–25 mg IV titrated to effect if SBP >100 or peripheral pulse present ● Dilute with 5–10 mL of NS and administer over 1 minute ● Avoid in elderly patients due to potential for sedation ● Should be given through AC or larger vessel due to extravasation risk ● If no vascular access or IM use preferred → **Promethazine** 25 mg IM	❑ Vascular access and fluid therapy ❑ Document level of consciousness before and after giving medication. ❑ **Ondansetron** ● **>2 years old- 0.1mg/kg** IV/IM/PO once (max 4mg) ✆ **<2 years old, requires OLMC contact** ✆ **Promethazine – NOT recommended**, requires OLMC contact.
PARAMEDIC	

PAIN MANAGEMENT

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Assess the patient's pain using verbal and non-verbal cues and appropriate pain scale
- ❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure, and pulse oximetry, when available
- ❑ Implement appropriate treatment guidelines for the chief complaint.

TREATMENT PLAN

- Consider non-pharmaceutical/family-centered comfort measures
- Immobilize any obvious injuries and place patient in a position of comfort
- Consider ice packs
- Implement pharmaceutical measures
  - Monitor patient vital signs every 5 minutes as this guideline is implemented.
  - Have naloxone available in case of respiratory depression.
  - Use caution in giving medications if SBP <100mmHg in adults, SBP <70 + (age in years x 2) mmHg for pediatrics, SpO_2 <90% without oxygen, or GCS <14
  - Use caution in pain medication dosing when the patient has adequate relief, pain score <5, adult SBP <100mmHg, peds SBP <70 + (age in years x 2) mmHg, SpO_2<90% without oxygen, or GCS <14
  - If pain and anxiety are both present → attempt to treat pain fully with analgesics alone *before* using analgesics and sedatives concurrently.
  - For agitated/combative patients that meet the ***BEHAVIORAL EMERGENCY*** guidelines, pain management should **NOT** be used in conjunction.

KEY POINTS/CONSIDERATIONS

- ❑ **KEY POINTS**
  - Use Wong-Baker Faces scale for pain assessment in patients 3-8 years old.
  - A FLACC scale can be used to assess pain in infants.
- ❑ **KEY CONSIDERATIONS**
  - Perform the pediatric assessment with guidance from the ***FAMILY CENTERED CARE*** guideline.
  - Parents are often the best resource for a baseline understanding of their child, especially in the case of the child with special healthcare needs. Ask the guardian if they have a written emergency treatment plan.
  - If the patient's written emergency treatment plan has medications not in protocol → please consult with online medical control.

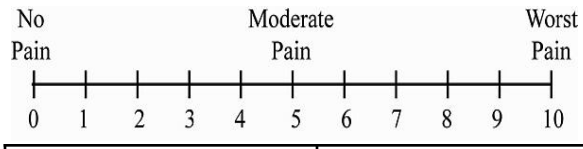
ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
EMR		
❑ Blood glucose ❑ Pulse oximetry monitoring		

EMT

- ❑ **Acetaminophen** 500-1000 mg PO single dose only
- ❑ **Ibuprofen** 600 mg PO single dose only

EMT

- ❑ **Acetaminophen** 15 mg/kg (max 650mg) PO *OR* rectum once
- ❑ **Ibuprofen** 10 mg/kg (max 600mg) PO single dose only.
  - ***Contraindicated in children <6 months old***



CATEGORIES	FLACC SCORING FOR INFANTS		
	0	1	2
FACE	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
LEGS	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
ACTIVITY	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
CRY	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
CONSOLABILITY	Content, relaxed	Reassured by occasional touching, hugging or talking to, distractible	Difficult to console or comfort

AEMT

- ❑ Vascular access and fluid therapy
  - **The order in which medications below are listed is not intended to indicate hierarchy, order, or preference of administration.**
  - **Dosages should be reduced by half when there is concern for drug or alcohol intoxication**
  - **Consider treating with antiemetics prior to pain management**

AEMT

- ❑ Vascular access and fluid therapy
  - **The order in which medications below are listed is not intended to indicate hierarchy, order, or preference of administration.**
  - **Dosages should be reduced by half when there is concern for drug or alcohol intoxication**
  - **Consider treating with antiemetics prior to pain management**

PAIN CONTROL

- ❑ **Acetaminophen** 500-1000 mg IV (infusion over 15 min), single dose only
- ❑ **Fentanyl** 25-100 mcg every 10 minutes IV/IO/IM/IN. (Max 200mcg)
- ❑ **Ketorolac** 15mg IV, 30mg IM, single dose only
- ❑ **Morphine Sulfate** 2-10 mg every 5 minutes IV/IO/IM titrated to effect. (Total max 15mg)
  - ✆ Contact OLMC for dosages above those provided or use of medication NOT fitting the guideline parameters.

PARAMEDIC

- ❑ **Ketamine**
  - **Diluted** 40 mg in 100mL of NS IV/IO infused over 15 minutes OR until analgesia is attained.
    - If pain relief obtained before full dose administered → may halt infusion

  OR
  - **IV/IO (Undiluted)**– 10-20 mg every 5 minutes to the desired effect or max dose of 40 mg **(slow push)**

PAIN CONTROL

- ❑ **Acetaminophen** 15mg/kg IV (infusion over 15 min), single dose only. Max dose 650mg
- ❑ **Fentanyl**
  - **IV/IM/IO:** 1 mcg/kg (max 50 mcg per dose)
  - **IN (intranasal):** 2 mcg/kg (max 100 mcg per dose). May repeat x 1 if needed after 10-15 min
- ❑ **Ibuprofen** 10mg/kg by mouth (PO) ONLY FOR USE in patients over the age of 6 months, single dose only. Max dose 600mg
- ❑ **Ketorolac** 0.5mg/kg IV/IM (max 15mg), single dose only, ONLY FOR USE in patients over the age of 2.
- ❑ **Morphine Sulfate** 0.05-0.1 mg/kg (Max of 4 mg per dose) IV/IM/IO
  - ✆ For additional doses, contact OLMC

PARAMEDIC

- ❑ **Ketamine**
  - **Diluted** 0.15 - 0.3 mg/kg (max 40 mg) in 100mL of NS IV/IO infused over 15 minutes **ONLY FOR USE in patients >2 years.**
    - If pain relief obtained before full dose administered → may halt infusion.

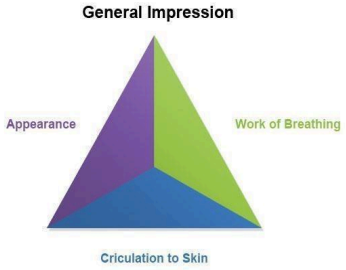
PEDIATRIC ASSESSMENT

ALL PROVIDERS

- ❑ The pediatric assessment is key for rapid assessment of severity of pediatric illness and should be modified for the developmental level of each patient
  - Obtaining a full set of vital signs, **including blood pressure,** should be a priority.
- ❑ Continuous cardiac monitoring; $ETCO_2$, and pulse oximetry, when available

TREATMENT PLAN (develop and implement plan based on assessment findings, resources, and training)

- Use the Pediatric Assessment Triangle (defined by the AAP) to form a general impression of the:



  - ○ Appearance: Evaluate tone, interactiveness, consolability, gaze, and speech or cry
  - ○ Breathing: Evaluate abnormal airway sounds, abnormal positioning, retractions, and nasal flaring.
  - ○ Circulation/Skin Color: Evaluate for pallor, mottling, delayed capillary refill and cyanosis

- If the patient looks ill, has poor perfusion, and depressed mental status, consider initiating CPR when the heart rate is less than:
  - ○ 80bpm for infants (up to 1 year of age)
  - ○ 60bpm for children (1 year – 8 years)
- Pay careful attention to the wide variety of normal vital signs. Do not assume that the pediatric patient is fine when they have vitals meeting the normal adult parameters.

Normal Pediatric Vital Signs

Age of Patient	HR		RR		Systolic BP	Temp	
0 days – <1 mo	>80	<205	>30	<60	>60	>36	<38
>1mo – <3 mo	>80	<205	>30	<60	>70	>36	<38
>3 mo – <1 yr	>75	<190	>30	<60	>70	>36	<38.5
>1 yr – <2 yrs	>75	<190	>24	<40	>70+ (age x 2)	>36	<38.5
>2 yrs – <4 yrs	>60	<140	>24	<40	>70+ (age x 2)	>36	<38.5
>4 yrs – <6 yrs	>60	<140	>22	<34	>70+ (age x 2)	>36	<38.5
>6 yrs – <10 yrs	>60	<140	>18	<30	>70+ (age x 2)	>36	<38.5
>10 yrs – <13 yrs	>60	<100	>18	<30	>90	>36	<38.5
>13 yrs – <18 yrs	>60	<100	>12	<16	>90	>36	<38.5

KEY POINTS/CONSIDERATIONS

- ❑ Perform the pediatric assessment with guidance from the ***FAMILY CENTERED CARE*** guideline.
- ❑ Parents are often the best resource for a baseline understanding of their child, especially in the case of the child with special healthcare needs. Ask the guardian if they have a written emergency treatment plan.
- ❑ If the patient's written emergency treatment plan has medications not in protocol → please consult with online medical control

PROCEDURAL / POST ROSC SEDATION

ALL PROVIDERS

Agitated/Combative patients should be treated per *BEHAVIORAL EMERGENCY* guideline.

- ❑ Focused history and physical exam
- ❑ Assess the patient's pain using verbal and non-verbal cues and appropriate pain scale.
- ❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure, and pulse oximetry, when available.
- ❑ Implement appropriate treatment guidelines for the chief complaint.

TREATMENT PLAN

- For transcutaneous pacing and cardioversion, consider if patient is awake, alert, and peri– stable.
- For post- ROSC patients, consider if patient's level of consciousness poses an immediate threat to the integrity of ET tube or IV access.
- **For an unstable patient, proceed to immediate intervention per appropriate guideline. Do not delay care for sedation in an unstable patient.**
- Stable patients post-ROSC, or with tachycardia or bradycardia, can often be transported without necessity of pre-hospital sedation or intervention.
- Monitor patient vital signs every 5 minutes as this guideline is implemented.
- Have naloxone available in case of respiratory depression.
- Use caution in giving medications if [adult] SBP <90mmHg (MAP <60), [pediatrics] SBP <70 + (age in years x 2) mmHg, SpO_2 <90% without oxygen, *OR* patient unable to adequately protect airway.
- Treatment of isolated pain without need for tolerance of one of the above procedures per ***PAIN MANAGEMENT*** guideline.

✆ If concerned about appropriateness of sedation → contact OLMC.

KEY POINTS/CONSIDERATIONS

- ❑ Use Richmond agitation sedation scale (RASS) with a goal RASS of -2 to -3.
- ❑ Medication:
  - Fentanyl acts on opioid pain receptors, but does not have true sedative or amnestic properties when used as a single agent.
  - Exercise extreme caution with any co-administration of midazolam and fentanyl, as respiratory depression and hypotension are often synergistic. Ketamine often has a smaller effect on respiratory effort and blood pressure, but may add cardiovascular stress in the event of a suspected primary cardiac etiology.

Richmond Agitation Sedation Scale (RASS)

Score	Term	Description
+4	Combative	Overly combative or violent; immediate danger to staff
+3	Very agitated	Pulls on or removes tubes/catheters, or aggressive behaviour
+2	Agitated	Frequent non-purposeful movement or patient-ventilator asynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert, but awakens for >10 sec, with eye contact, to voice
-2	Light sedation	Briefly awakens (<10 sec), with eye contact, to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but movement to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
	EMT	

AEMT

PARAMEDIC

- ❑ Vascular access and fluid therapy
  - **The order in which medications below are listed is not intended to indicate hierarchy, order, or preference of administration.**
  - **Medications may be combined as per medical director guidance and patient response.**

SEDATION

- ❑ **Fentanyl** 50 – 100 mcg IV
  - May administer additional dose of 50- 100 mcg IV (Max 200 mcg total dose)
- ❑ **Ketamine** 100 mg IV Initial dose
  - May administer additional doses of 50mg every 5 minutes (Max total dose 300 mg)
- ❑ **Midazolam** 2.5 mg IV
  - May administer additional doses of 0.5 – 2.5 mg every 5 minutes (Max total dose 10 mg)

✆ Contact OLMC for dosages above those provided, need for ongoing sedation, or use of medication NOT fitting the guideline parameters.

PARAMEDIC

- ❑ Vascular access and fluid therapy
  - **The order in which medications below are listed is not intended to indicate hierarchy, order, or preference of administration.**
  - **Medications may be combined as per medical director guidance and patient response.**

SEDATION

- ❑ **Fentanyl** 0.5 mcg/kg IV
  - Max initial dose 50 mcg
  - May administer additional dose of 0.5mcg/kg IV (Max total dose 1 mcg/kg)
- ❑ **Ketamine** 1 mg/kg IV
  - Max initial dose 100mg
  - May administer additional doses of 0.5 mg/kg every 5 minutes (Max total dose 3 mg/kg)
  - Only for use in patients over the age of 2 years.
- ❑ **Midazolam** 0.05 mg/kg IV (Max 2.5 mg)
  - May administer additional doses of half initial dose every 5 minutes (Total max dose 10 mg)

✆ Contact OLMC for dosages above those provided, need for ongoing sedation, or use of medication NOT fitting the guideline parameters.

SHOCK, SEPSIS, & FLUID THERAPY

ALL PROVIDERS

❑ Focused history and physical exam
- Blood glucose, oxygen saturation and temperature assessment
- Continuous cardiac monitoring and $ETCO_2$, when available
  - Obtain a 12-lead EKG when available
- Consider shock in patients with *ONE OR MORE* of the following:
  - Adult vital signs:
    - HR >110
    - SBP <90 or MAP <65
    - Shock Index >1
      - Shock Index = HR ÷ SBP
  - Pediatric vital signs:
    - SBP <70 + (age in years x 2) mmHg for children, age based tachycardia, and/or RR >20 BPM
  - Skin signs:
    - cold clammy skin
    - febrile or delayed capillary refill
  - Mental status:
    - altered
    - lethargic
    - irritable (esp. in infants)

❑ Evaluate for the source of shock; including distributive, hypovolemic, obstructive, or cardiogenic.

❑ If the patient has **shock secondary to trauma** or **hemorrhagic shock** (any source) → blood product is preferred over IV fluid.
- If blood products are available → treat according to the ***BLOOD PRODUCT TRANSFUSION*** guideline.

❑ **Sepsis Alert** – Contact the hospital and initiate a Sepsis Alert if:
- Suspected or documented Infection **AND EITHER**
  - Two or more of the following criteria are met or equivalent abnormal pediatric values:
    - Temp >100.4 °F (38°C) *OR* <96.8°F (36°C)
    - RR >20 BPM
    - Heart Rate >90 bpm
    - $ETCO_2$ ≤25 mmHg

OR
  - Signs of hypoperfusion: SBP <90mmHg *OR* MAP <65mmHg *OR* $ETCO_2$ <25

TREATMENT PLAN
- Address the underlying cause of shock, if possible.
- Administer oxygen as needed to keep oxygen saturations between 90-94%.
- Ensure patient warmth, resuscitate with warm IV fluids when available.
- Pregnancy >20 weeks gestation - Transport in partial left lateral decubitus position. Place wedge-shaped cushion or multiple pillows under patient's right hip and shoulders to elevate right side 30-45°.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
	EMT	

AEMT

- ❑ Vascular access
  - Insert 2 large bore IV/IO

IF TRAUMATIC SHOCK OR PERMISSIVE HYPOTENSION SUSPECTED

- ❑ If SBP >90 *OR* MAP >65 (intact radial pulse):
  - No IV fluid bolus
  - Place saline locks on IVs *OR* run at TKO rate
- ❑ If SBP <90 *OR* MAP <65:
  - Give fluid bolus 500mL at a time, reassess and repeat as needed to:
    - Maintain SBP >90mmHg **WITHOUT** A CLOSED HEAD INJURY
    - Maintain SBP >110 mmHg **WITH** A CLOSED HEAD INJURY
  - Once minimum blood pressures have been achieved the patient should have a saline lock and no further fluid should be administered unless the BP falls below the limits.

✆ If the patient remains hypotensive after 2 liters has been administered → call OLMC

NON TRAUMATIC SHOCK

- ❑ Give IV fluid bolus 500 ml at a time, reassess and repeat up to a maximum of 2 liters as required for reversal of signs of shock
- ❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus.

✆ If the patient remains hypotensive after 2 liters has been administered → call OLMC

CARDIOGENIC SHOCK

- ❑ In patients with CHF, pulmonary edema, and cardiogenic shock, IV fluids should be withheld, to avoid worsening shock.
  - Rapidly transport to hospital

KIDNEY FAILURE (i.e. dialysis patients)

- ❑ Give 500mL fluid boluses (Maximum of 1 Liter) and reassess for reversal of the signs of shock.

AEMT

- ❑ Vascular access
  - Insert 2 large bore IV/IO

IF TRAUMATIC SHOCK SUSPECTED

- ❑ Give fluid bolus of 20 mL/kg at a time (max 1L), reassess and repeat up to a maximum of 40 mL/kg total (Max 2L); Reassess for reversal of the signs of shock

✆ If the patient remains hypotensive after 40mL/kg (max 2L) of NS → call OLMC

NON TRAUMATIC SHOCK

- ❑ Provide 20mL/kg (max 1 L) boluses up to a maximum of 60mL/kg (max 3L) and reassess for reversal of the signs of shock

✆ If the patient remains hypotensive after 60mL/kg (max 3L) of NS → call OLMC

- ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.**
  - Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

✆ If the patient remains hypotensive after 60mL/kg (max 3L) of NS → call OLMC

CARDIOGENIC SHOCK

- ❑ In patients with CHF, pulmonary edema and cardiogenic shock, IV fluids should be withheld, to avoid worsening shock.
  - Apply high-flow oxygen
  - Rapidly transport to the hospital

KIDNEY FAILURE (i.e. dialysis patients)

- ❑ Give 10 mL/kg fluid boluses (max 500mL) up to a maximum of 20mL/kg (max 1L) and reassess for reversal of the signs of shock.

✆ If the patient remains hypotensive after 20 ml/kg has been administered → call OLMC

PARAMEDIC

IF TRAUMATIC OR HEMORRHAGIC SHOCK SUSPECTED

- ❑ **Treat with blood product if available** as per ***BLOOD PRODUCT TRANSFUSION*** guideline; if no blood products available → follow permissive hypotension / conservative fluid bolusing guidelines as in AEMT scope.

FOR USE ONLY IN NON-TRAUMATIC SHOCK

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP >100 mmHg.

PARAMEDIC

IF TRAUMATIC OR HEMORRHAGIC SHOCK SUSPECTED

- ❑ **Treat with blood product if available** as per ***BLOOD PRODUCT TRANSFUSION*** guideline; if no blood products available → follow permissive hypotension / conservative fluid bolusing guidelines as in AEMT scope.

FOR USE ONLY IN NON-TRAUMATIC SHOCK

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

TRACHEOSTOMY MANAGEMENT

ALL PROVIDERS

❑ Focused history and physical exam
- Assess ABC's for evidence of current apnea, airway reflex compromise or difficulty in ventilatory effort.
- Assess medical conditions, burns or traumatic injuries that may have or will compromise the airway.

❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure, and pulse oximetry, when available.
- Obtain a 12-lead EKG when available

TREATMENT PLAN
- Provide basic airway maneuvers to all compromised airways, i.e. jaw-thrust, airway adjuncts, and oxygen.
- Identify and treat underlying reversible medical conditions (narcotic overdose, hypoglycemia, etc.).
- Provide supplemental oxygen and assisted ventilation as needed for the patient to maintain an oxygen saturation 90–94% and $ETCO_2$ of 35–45.
- Always ensure proper care of the C-spine during airway treatment.
- Keep NPO. Stop any GI Feedings and do not use GI tube during resuscitation except to vent tube if assisted ventilations being delivered
- BVM is the preferred method of ventilation <10 years old.
- Suctioning
  - Infants and young children require a clear nose for effective breathing. Suctioning oral and nasal passages are essential in management in respiratory distress
  - Using an 8Fr soft catheter, clear each nostril (suction for less than 10 seconds per nare)
  - If distress persists, lubricate the nare with 1-2 drops of saline and suction to the depth of the tip of the child nose to their ear lobe.
  - Suction while withdrawing, use a twisting motion, for no more than 10 seconds
- Tracheostomy/Home Ventilator
  - Primary caretakers and families are your best resource for understanding the equipment they are using.
  - Disconnect the ventilator and assist ventilations with BVM if the patient is apneic, unresponsive, or has severe respiratory distress. (Disconnecting a vent poses a very HIGH risk for body fluid exposure, recommend full mask/eye protection be worn)
  - If unable to ventilate → suction the tracheostomy, then reattempt ventilatory efforts.
  - If there is difficulty ventilating a tracheostomy patient → consider "D.O.P.E." (Dislodged? Obstruction? Pneumothorax? Equipment failure?)

ADULT

EMR

❑ Pulse oximetry monitoring

❑ Ventilate tracheostomy tube with BVM when apneic or exhibiting respiratory distress.
- Consider an airway adjunct when not contraindicated (facial fractures, intact gag response, etc).

❑ Avoid hyperventilation and maintain a ventilatory rate of 10-12 breaths per minute.

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

❑ Pulse oximetry monitoring

❑ Ventilate tracheostomy tube with BVM when apneic or exhibiting respiratory distress.
- Consider an airway adjunct when not contraindicated (facial fractures, intact gag response, etc).

❑ Avoid hyperventilation – recommended pediatric ventilatory rates:
- Infant (0-12 month): 25 breaths per minute
- 1-3 yrs: 20 breaths per minute
- 4-6 yrs: 15 breaths per minute

EMT

AEMT

PARAMEDIC

TRACHEOSTOMY ASSISTANCE

- ❑ Provide supplemental oxygen
- ❑ Suction the patient appropriately (use in-line suction if available)
- ❑ Replace Tracheostomy tube if needed
- ❑ If unable to ventilate → pass an appropriately sized ETT through the stoma 1-2 inches
- ❑ If unable to pass a tracheostomy tube or ETT → use BVM, consider using a small LMA/Igel or BMV to ventilate over the stoma if unable to BMV from above, or place a supraglottic airway device (while occluding stoma).
  - ✆ Contact OLMC for further instructions.

VENTILATOR MANAGEMENT

- ❑ Work with the family to troubleshoot the machine
- ❑ Address tracheostomy as above
- ❑ If you need to disconnect for transport → provide adequate BVM ventilations similar to home respiratory rate settings
  - ✆ Contact OLMC for further instructions as needed.

PARAMEDIC

TRACHEOSTOMY ASSISTANCE

- ❑ Provide supplemental oxygen
- ❑ Suction the patient appropriately (use in-line suction if available)
- ❑ Replace tracheostomy tube, with patient's back up tracheostomy tube if needed-consider passing the new trach over a boogie or red rubber/suction catheter to facilitate replacement
- ❑ If unable to ventilate → pass an appropriately sized ETT through the stoma 1-2 inches
- ❑ If unable to pass a tracheostomy tube or ETT → use BVM, consider using a small LMA/Igel or BMV to ventilate over the stoma if unable to BMV from above, or place a supraglottic airway device (while occluding stoma).
- ❑ Use orotracheal intubation as a last resort (peds often have trachs because of upper airway obstruction, so orotracheal intubation may be extremely difficult).
  - ✆ Contact OLMC for further instructions.

VENTILATOR MANAGEMENT

- ❑ Work with the family to troubleshoot the machine
- ❑ Address tracheostomy as above
- ❑ If you need to disconnect for transport → provide adequate BVM ventilations similar to home respiratory rate settings
  - ✆ Contact OLMC for further instructions as needed.

Cardiac Patient Care Guidelines

These guidelines were created to provide direction for each level of certified provider in caring for cardiac patients. All of these directions, dosages and provisions are subject to change with a later notice or revision of the guidelines. The OLMC physician will always be the final word on treatment in the field. If there are ever any discrepancies between the guidelines and the OLMC physician these should be documented and brought to the attention of the physician at the receiving hospital. If the explanation is not sufficient to the provider, then they may bring the issue to their medical director or the BEMS for review.

General Approach to Cardiac Patient Care Guidelines

- Assess your patient prior to initiating a guideline.
- More than one guideline may apply.
- If conflicts arise between treatment guidelines → contact OLMC for clarification.
- Providers may provide treatment up to the level of their certification only.
- Air Medical Transport Service personnel function under their own clinical guidelines.
- Contact your receiving hospitals and OLMC as soon as clinically possible for each patient.
- OLMC with a physician may change your treatment plan.
- Any variations to a guideline by the OLMC or physician should be clarified to ensure that the provider has properly characterized the situation.
- The OLMC Physician has the final word on treatment once contact is made.
- The OLMC Physician must approve usage of dosages in excess of the guidelines.

General Pediatric Considerations

- Pediatric lowest acceptable systolic blood pressures are: birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

FSED Cardiac: Unless stabilization is needed, suspected cardiac emergencies, specifically STEMIs, should bypass the FSEDs and be taken to a facility with a Cardiac Cath Lab. At the same time, stable patients with a complaint of "chest pain" who do not have a STEMI, or serious arrhythmia, can easily be evaluated at an FSED.

BRADYCARDIA (Symptomatic)

ALL PROVIDERS

❑ Focused history and physical exam
- Assess for signs of poor perfusion, presence of pulse, hypotension or other signs of shock, altered mental status, ischemic chest pain, or acute heart failure.
- Obtain a blood glucose level.
- Continuous cardiac monitoring; EKG, $ETCO_2$, blood pressure, pulse oximetry
  - Obtain 12-lead EKG (when stable)

❑ Do not attempt transcutaneous pacing in the patient in cardiac arrest. Instead focus on high-quality CPR and ALS care.

TREATMENT PLAN

- Only treat bradycardia **IF** the patient is unstable (hypotension or signs of poor perfusion).
- If patient is a newborn → follow the ***NEWBORN RESUSCITATION*** guideline.
- Identify and treat the underlying cause, if possible. Potential causes include:
  - Hypoxia
  - Shock
  - 2nd or 3rd degree heart block
  - Toxin exposure (beta-blocker, calcium channel blocker, organophosphate, digoxin)
  - Electrolyte disorder (hyperkalemia)
  - Increased intracranial pressure (ICP)
  - Hypothermia
  - Acute MI
  - Pacemaker failure
- Maintain airway → assist with breathing, and provide oxygen as necessary
- Ensure patient warmth

❑ **Pediatric patient** (<8-year-old)
- Aggressive oxygenation with high flow oxygen and assisted ventilations with a BVM, as indicated.
- Persistent heart rate <60/min, signs of poor perfusion, and lack of palpable pulse following aggressive oxygenation and ventilation: **Begin Chest Compressions**

KEY POINTS/CONSIDERATIONS

❑ In pregnant patients of >20 weeks' gestation: place wedge-shaped cushion or multiple pillows under patient's right hip to displace uterus to the left, off of the vena cava.

❑ Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
	EMT	
❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure		

AEMT

- ❑ Vascular access and fluid therapy
- ❑ **Atropine** 1 mg IV/IO
  - Repeat as needed every 3 minutes
  - Maximum total dose of 3 mg
- ❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP >100 mmHg.
- ❑ **Transcutaneous pacing (TCP)** at an initial rate of 80 beats per minute if the patient does not respond to medications. Use anterior/posterior pad positioning. Ensure mechanical and electrical capture. Consider the need for sedation prior to TCP if patient is conscious, per ***PROCEDURAL / POST ROSC SEDATION*** guideline.
- ✆ **Contact OLMC for dosages above those provided or use of medication NOT fitting the guideline parameters**.

AEMT

- ❑ Vascular access and fluid therapy
- ❑ **If indicated, consider Atropine** 0.02 mg/kg IV/IO
  - Maximum single dose of 0.5 mg
  - Repeat Atropine every 3-5 minutes as needed until max 2 doses
- ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.**
  - Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Transcutaneous pacing (TCP)** at an initial rate of 100 beats per minute, if the patient does not respond to medications. Use anterior/posterior pad positioning. Ensure mechanical and electrical capture. Consider the need for sedation prior to TCP if patient is conscious, per ***PROCEDURAL / POST ROSC SEDATION*** guideline.
- ✆ **Contact OLMC for dosages above those provided or use of medication NOT fitting the guideline parameters.**

CARDIAC ARREST

ALL PROVIDERS

*For Traumatic Arrest refer to the **GENERAL TRAUMA MANAGEMENT** guideline*

❑ Focused history and physical exam
- Assess for evidence that resuscitation should not be attempted per the ***DEATH DETERMINATION & TERMINATION OF RESUSCITATION*** guideline.

❑ Continuous EKG, $ETCO_2$, and pulse oximetry monitoring when available

TREATMENT PLAN
- **Assess for presence of a pulse, respirations, and consciousness. If absent:**
  - **Begin chest compressions for 2 min**
  - **Apply AED and shock if advised**
  - AEMT/PM: Apply cardiac monitor/defibrillator and shock if Vtach/Vfib

KEY POINTS/CONSIDERATIONS

❑ **GENERAL KEY CONSIDERATIONS**
- Anterior/Posterior pad positioning is now preferred for defibrillation.
- Effective chest compressions are critical
  - Minimize interruptions in chest compressions
    - Precharge the defibrillator and countdown to rhythm check/defibrillation
    - Use a verbal 10 second countdown during any pause to limit hands-off time
  - Rate: 100-120/min recommend metronome or CPR feedback
  - Depth: 2-2.5 inches (adult) / 1/3 of chest depth (pediatric)
  - Allow full chest recoil after each compression
  - After each shock, immediately perform 2 minutes of chest compressions before checking rhythm/pulse
  - Rotate compressors every 2 minutes
    - 30:2 adult patient with 1 or 2 rescuer and infant or child 1 rescuer
    - 15:2 infant or child 2 rescuer
  - If using mechanical CPR:
    - Apply device with minimum interruption in CPR
    - Check rhythm every 2 minutes. When an organized rhythm is present, check pulse (10 seconds only, use a verbal countdown)
    - Duration of resuscitation as below
- Consider the Pit Crew model as an approach to treatment
  - Pre-defined roles, as determined by a specific EMS agency, for members of an integrated team of first responders, BLS, and ALS.
  - Designated individuals for chest compressions
  - Designated individual for overall code leadership/management
  - Designated individual for airway management
  - Additional roles to be assigned as determined by specific agency based on provider availability include: IO/IV access, medication administration, CPR quality monitoring, cardiac rhythm monitoring, defibrillation
  - Consider transition of roles as additional providers become available to ensure maximal use of resources
  - Treatment of the adult cardiac arrest patient in the field is preferred in the majority of cases and is associated with improved outcomes
  - Assume cardiac origins for all adult arrests unless evidence to the contrary. Consider underlying causes and treat them when possible.
  - Duration of resuscitation. Consider prolonged attempts in patients with an initial shockable rhythm and a witnessed collapse
  - Initial shockable: <5% survival after 40 minutes of resuscitation attempt
  - +Initial Asystole/PEA rhythms: <1% survival after 20 minutes of resuscitation attempt
- **H's & T's** - Treat as appropriate with confirmed or suspected Hypovolemia, Hypoxia, Hydrogen ion (Acidosis), Hyperkalemia, Hypothermia, Hypoglycemia, or specific Toxins.

❑ **PREGNANCY** (>20 weeks gestation)

- Perform manual displacement of the uterus to the patient's left. If unable to perform manual displacement, place wedge-shaped cushion or multiple pillows under patient's right hip to achieve 30° lateral tilt.
- Transport pregnant patients to the nearest emergency department without delay while attempting to provide continuous compressions and defibrillation (if applicable). There is potential to perform an emergency cesarean section in the ED, which may save the fetus and the mother.

❑ **PEDIATRIC POPULATION**

- Consider transport in pediatric arrest after 15 minutes of field resuscitation, including high-quality CPR, effective ventilations, and IV/IO access.
- Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years = 70mmHg + (age x 2), >10 years = 90mmHg.

❑ As nationally-established cardiac care guidelines (e.g. ACLS, PALS) are updated, these may be integrated into performance, as per agency medical director.

ADULT	PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring ❑ **AUTOMATED EXTERNAL DEFIBRILLATOR (AED)** ● Defibrillate immediately if AED advises shock. ● Resume CPR immediately after each shock and continue for 2 minutes ● Check pulse and repeat shock if prompted by AED	
EMT	
AEMT	**AEMT**
ALL RHYTHMS ❑ Vascular access and fluid therapy ❑ Consider placement of a supraglottic airway device without interrupting CPR ❑ **Epinephrine:** 1 mg (10 ml of 0.1 mg/ml) IV/IO push every 2-4 min as long as the patient remains pulseless. Note that better outcomes are observed with earlier administration of epinephrine ❑ If hypovolemia suspected → consider NS 1000 mL IV/IO bolus ❑ Consider **Naloxone** .4–2 mg IV/IM/IO/IN for suspected narcotic overdose. Reference *OPIOID OVERDOSE* guideline.	**ALL RHYTHMS** ❑ BVM, supraglottic airway device, vascular access and fluid therapy ❑ **Epinephrine:** 0.01 mg/kg (0.1 mg/ml) IV/IO every 2-4 min as long as the patient remains pulseless. Note that better outcomes are observed with earlier administration of epinephrine ● Max dose = 1 mg (10 ml of 0.1 mg/ml) ❑ If hypovolemia suspected → consider NS 20 ml/kg (max 1L) IV/IO bolus, reassess and repeat if needed to a max of 60 mL/kg (max 3L) ❑ Consider **Naloxone** 0.1 mg/kg (max 2 mg per dose) IV/IM/IO/IN for suspected narcotic overdose. Reference *OPIOID OVERDOSE* guideline.

SHOCKABLE RHYTHM (VF/VT) PRESENT

- ❑ **Defibrillation**
  - **The anterior/posterior pad position is preferred for defibrillation**
  - Follow manufacturer's recommendations for energy settings
    - Resume CPR immediately after shock and continue for 2 minutes
  - Check rhythm and pulse every 2 min if an organized rhythm is present
- ❑ **Anti-arrhythmics are indicated for shockable rhythms that are unresponsive to defibrillation**
  - May administer either **ONE** of these anti-arrhythmics:
    - **Amiodarone** 300 mg IV/IO, second dose is 150 mg IV/IO after 5 min
    - **Lidocaine** 1mg/kg IV/IO. May repeat every 3-5 min as needed up to 3mg/kg

✆ Contact OLMC before terminating resuscitative efforts in the field.

SHOCKABLE RHYTHM (VF/VT) PRESENT

- ❑ **Defibrillation**
  - **The anterior/posterior pad position is preferred for defibrillation**
  - **2 J/kg** for the first shock with either a monophasic or biphasic defibrillator. Second and subsequent shocks increase by 2 J/kg, up to a max dose 10 J/kg
    - Resume CPR immediately after shock and continue for 2 minutes
  - Check rhythm and pulse every 2 min if an organized rhythm is present
- ❑ **Anti-arrhythmics are indicated for shockable rhythms that are unresponsive to defibrillation**
  - May administer either **ONE** of these anti-arrhythmics:
    - **Amiodarone** 5mg/kg IV/IO (max 300 mg), may repeat up to 3 total doses (max 150 mg subsequent doses) (Total Max 500 mg = 300 + 150x2)
      - Rapid bolus – may repeat 2 more times every 5 min as needed with a max dosage of 15mg/kg during acute treatment.
    - **Lidocaine** 1mg/kg IV/IO. May repeat every 3-5 min as needed up to 3mg/kg

✆ Contact OLMC before terminating resuscitative efforts in the field.

PARAMEDIC

ALL RHYTHMS

- ❑ If unable to adequately ventilate with supraglottic airway device → may consider endotracheal intubation, per ***AIRWAY*** and ***TRACHEOSTOMY MANAGEMENT*** guideline
- ❑ Intubation must not interfere with chest compressions.
- ❑ Special Circumstances:
  - Known or Suspected Hyperkalemia
    - **Calcium Chloride** 1 gram IV/IO over 2 min. May repeat every 5 min X2
      OR
    - **Calcium Gluconate** 3 grams IV/IO over 2 min
    - **Sodium Bicarbonate** 1 mEq/kg IV/IO may repeat every 5 min X2
  - Polymorphic VT associated with long QT
    - **Magnesium Sulfate** 2 gm IV/IO over 1-2 min (Max 3 doses)
    - **Lidocaine** 1 mg/kg IV/IO may repeat every 3-5 min as needed up to 3mg/kg.
      - Follow with continuous infusion (1-4 mg/ min) after return of perfusion

✆ Contact OLMC for further orders or therapies.

PARAMEDIC

ALL RHYTHMS

- ❑ If unable to adequately ventilate with BVM (preferred) or supraglottic airway device → may consider endotracheal intubation per ***AIRWAY and TRACHEOSTOMY MANAGEMENT*** guidelines.
- ❑ Intubation must not interfere with chest compressions.
- ❑ Special Circumstances
  - Known or Suspected Hyperkalemia
    - **Calcium Chloride** 20 mg/kg IV/IO may repeat in 10 min (max 2 grams)
      OR
    - **Calcium Gluconate** 100 mg/kg IV/IO may repeat in 10 min (max 3 grams)
    - **Sodium Bicarbonate** 1 mEq/kg IV/IO (Max of 50 mEq). For <2 years of age use 4.2% concentration.
  - Polymorphic VT associated with long QT
    - **Magnesium Sulfate** 50 mg/kg (Max = 2,000 mg) IV/IO over 2 min
    - **Lidocaine** 1 mg/kg IV/IO may repeat every 3-5 min up to 3 mg/kg
      - Maintenance 20-50 mcg/kg/min

✆ Contact OLMC for further orders or therapies.

CARDIAC CHEST PAIN (ACUTE CORONARY SYNDROME)

ALL PROVIDERS

❑ Focused history and physical exam
- Assess for signs or symptoms suggestive of ischemia or infarction.
- Ask the patient to describe the pain utilizing the O-P-Q-R-S-T mnemonic.
  - Onset of the event, Provocation or Palliation, Quality of the pain, Region and Radiation, Severity, Time/Trend (history)
- Determine whether the patient (male or female) has taken erectile dysfunction medications such as Viagra, Levitra or Cialis within the last 24 hours as nitroglycerin is contraindicated in these patients.

❑ Continuous cardiac monitoring; EKG, CO_2, pulse oximetry, blood pressure, and 12-lead EKG (with transmit capabilities) when available.

❑ For prolonged transports >15 minutes: serial 12-lead EKGs should be considered every 10 minutes until ED arrival

TREATMENT PLAN
- Chest pain patients should only receive oxygen therapy as needed to target O_2 saturations ~94%

KEY POINTS/CONSIDERATIONS

- Assess blood glucose level
- Chest pain with cardiac origin is rare in children, consider other causes;
  - Asthma
  - Foreign body
  - Infection
  - Trauma

ADULT

EMR

❑ Blood glucose

❑ Pulse oximetry monitoring

EMT

❑ **Aspirin:** 325 mg PO chewed if patient is >18 years old and no reported allergies to aspirin
- Administer even if patient takes a daily dose

❑ Assist patient with prescribed nitroglycerin SL every 5 minutes, up to 3 doses, as long as dyspnea or chest pain persist and SBP >90 mmHg
- If the patient (male or female) has taken erectile dysfunction medications within the last 24 hours → Do **NOT** administer nitroglycerin

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

EMT

AEMT

- ❑ Vascular access and fluid therapy
- ❑ IV access prior to administration of nitroglycerin is preferable, but not required
- ❑ 12-lead EKG (if available). Acquire and transmit.
- ❑ If the patient has a STEMI → transport to the closest available STEMI/PCI receiving center (if available). Give advanced notification of EKG findings and transmit EKG if possible.
  - Confirm that a catheterization lab will be available for the patient.
  - If NOT → then consider transporting to a different STEMI/PCI receiving center
- ❑ **Nitroglycerin:** 0.4 mg (every 5 minutes) (max of 3 doses) SL as long as chest symptoms persist *and* SBP >90 mmHg
  - Administer with caution in patients with known inferior ST-Elevation MI.
  - If the patient (male or female) has taken erectile dysfunction medications within the last 24 hours → do **NOT** administer nitroglycerin
  - If hypotension occurs following nitroglycerin administration → administer 500mL bolus of NS and withhold further nitroglycerin.
- ❑ Pain medications per ***PAIN MANAGEMENT*** guideline
- ❑ **Fentanyl** appears to cause less platelet activation than morphine and may be preferred in patients with ACS

PARAMEDIC

✆ Contact OLMC for further instructions.

AEMT

PARAMEDIC

✆ Contact OLMC for further instructions.

CONGESTIVE HEART FAILURE / PULMONARY EDEMA

ALL PROVIDERS

❑ Focused history and physical exam
- Determine whether the patient (male or female) has taken erectile dysfunction medications such as Viagra, Levitra or Cialis within the last 24 hours as nitroglycerin is contraindicated in these patients.
- Assess blood glucose level

❑ Continuous cardiac monitoring; $ETCO_2$, pulse oximetry, and 12-lead EKG, when available

TREATMENT PLAN
- Maintain airway → assist with breathing as necessary, provide oxygen as needed to target SpO_2 90-94%

KEY POINTS/CONSIDERATIONS

❑ In pregnant patients of >20 weeks gestation: Place wedge-shaped cushion or multiple pillows under patient's right hip and manually displace the uterus.

❑ Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

ADULT

PEDIATRIC (<15 years of Age)
NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

❑ Blood glucose

❑ Pulse oximetry monitoring

EMT

❑ Assist patient with prescribed nitroglycerin SL every 5 minutes, up to 3 doses, as long as dyspnea or chest pain persist and SBP >90 mmHg
- If the patient (male or female) has taken erectile dysfunction medications within the last 24 hours → do **NOT** administer nitroglycerin

❑ **CPAP/BiPAP** – Consider when the patient is awake, cooperative and SBP >90 mmHg
- Explain the procedure to the patient
- CPAP is preferred if the primary concern is CHF or pulmonary edema
- **CPAP** - Provide 10 L/min oxygen and PAP at 10 cm H2O
- **BIPAP** – Provide 10 L/min oxygen and IPAP at 10 cm H2O with EPAP at 5 cm H2O

✆ Contact OLMC to discuss further settings and treatment above the initial setup.

EMT

❑ **CPAP/BiPAP** – ONLY use when the patient is on the machine at home. Maintain home settings and bring machine with the patient.
- If unable to adequately ventilate → return to BVM

AEMT

❑ Supraglottic airway device, vascular access and fluid as needed
- IV access prior to nitrates is preferred if possible
- Limit fluid bolus to 250–500 mL NS

❑ If dyspnea *OR* chest pain persist *AND* SBP >90 mmHg → **Nitroglycerin** 0.4 mg SL every 5 minutes (max of 3 doses)

❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus.

AEMT

❑ Supraglottic airway device, vascular access and fluid as needed

❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.**
- Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP >100 mmHg.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

NEWBORN RESUSCITATION

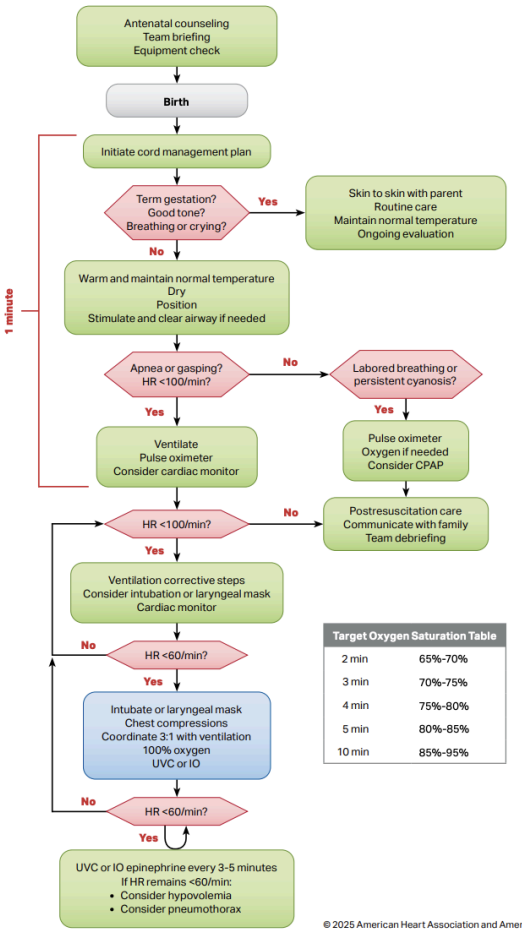
ALL PROVIDERS

- ❑ Focused history and physical exam: Term baby? Breathing? Tone?
- ❑ Continuous cardiac monitoring; EKG, $ETCO_2$, and pulse oximetry, when available
- ❑ If the newborn is crying and pink with a good tone; newborn can stay with the mother.

TREATMENT PLAN

- **If the newborn is apneic, slow to respond, has slow or gasping respirations, or persistent central cyanosis:**
  - **First 30 seconds**: Warm, dry, and stimulate the baby. Consider suction (bulb syringe) mouth, then nose.
    - Evaluate respirations, heart rate, and activity. If baby has good tone and is crying → keep baby warm with skin- to- skin care or dry blankets. Monitor tone, HR, and breathing continuously.
  - Next **30 seconds:** If after first 30 seconds the baby remains apneic, lethargic, *AND/OR* has HR <100 → perform 30 seconds of positive pressure ventilation (PPV) with BVM with a rate of 40-60 breaths/minute.
    - If available, add PEEP peep valve and a manometer. PEEP GOAL: 5-8 cm H_2O
    - Watch for chest rise to ensure adequate ventilation and to prevent over vigorous bagging. If no chest rise → reposition mask seal and increase pressure slightly
    - Start with room air resuscitation, if no improvement → increase O_2%, target O_2 saturations to 80-90% (excessive oxygenation can be harmful to the newborn brain especially premature babies).
    - Target PPV efforts to improving tone and increasing heart rate; if HR remains <100 despite adequate PPV→ titrate up O_2
  - **Next 30 seconds:** If after an additional 30 seconds of effective PPV the baby continues to have a HR <60 → begin CPR with a breath/compression ratio of 1:3.
    - Use 2 thumb encircling technique for CPR, rate of 120 compressions/min

Neonatal Resuscitation Algorithm.



KEY POINTS/CONSIDERATIONS

- ❑ As nationally-established neonatal resuscitation guidelines (NALS, NRP, etc.) are updated, these may be integrated into performance, as per agency medical director
- ❑ Check glucose and treat if <30 mg/dl
- ❑ **KEEP BABY AS WARM AS POSSIBLE**

EMR

EMT

- ❑ BVM has been ineffective despite repositioning infant and checking equipment
- ❑ Chest compressions are necessary

AEMT

- ❑ Supraglottic airway device placement may be indicated when:
  - BVM has been ineffective despite repositioning infant and checking equipment
  - Chest compressions are necessary
- ❑ IV or IO at a keep open rate (approx. 10 ml/hr) after boluses to avoid volume overload
  - IV required only when required for fluid resuscitation or parenteral medication
  - IO infusions are only indicated when life-threatening conditions are present
- ❑ **Epinephrine**
  - **IV/IO- 0.01-0.03 mg/kg = 0.1-0.3 ml/kg** for HR <60/min despite 30 seconds of effective CPR with PPV. Repeat every 3-5 minutes until spontaneous heart rate remains >60 bpm

EVIDENCE OF HYPOPERFUSION OR HYPOVOLEMIA

- ❑ NS (IV or IO) @ 10 mL/kg syringe bolus over 5-10 min
- ❑ Run D10 if available for maintenance fluid at 10 ml/hr after bolus

✆ Additional boluses require physician approval.

PARAMEDIC

- ❑ **ENDOTRACHEAL INTUBATION**
- ❑ May be indicated if BVM has been ineffective despite repositioning infant and checking equipment and/or chest compressions are necessary.
  - AFTER intubation considerations:
    - Insert a gastric tube in all intubated patients
    - Suction the trachea using a suction catheter through the endotracheal tube.
      - If there is no chest rise despite a successful intubation → apply a meconium aspirator with appropriate pressure and remove the endotracheal tube.
      - If this process is unsuccessful → repeat intubation may be indicated
- ❑ **Epinephrine**: Endotracheal ET: (IV/IO route preferred) 0.05 - 0.1 mg/kg (0.5 to 1 mL/kg of 0.1 mg/mL) every 3 - 5 minutes until IV access established or return of spontaneous circulation
- ❑ **Dextrose 10%** per ***HYPOGLYCEMIA / HYPERGLYCEMIA*** guidelines

POST CARDIAC ARREST (ROSC)
RETURN OF SPONTANEOUS CIRCULATION

ALL PROVIDERS

- ❑ Focused history and physical exam
  - ● Blood glucose assessment may be performed but need not be part of intra-arrest management
- ❑ Continuous cardiac monitoring; EKG, $ETCO_2$, and pulse oximetry, when available
  - ● Assist ventilations to maintain $ETCO_2$ 35-45mmHg
- ❑ Attempt to maintain normothermia
- ❑ Prepare for transport while maintaining monitoring and re-checking for pulse periodically
- ❑ Consider starting a post-ROSC bundle of care on scene (including above recommendations) prior to initiating transport due to the high likelihood of early re-arrest:
- ❑ Document blood pressure after establishing ROSC
- ❑ Acquire and transmit a 12-lead EKG after establishing ROSC unless clear non-cardiac cause
  - ○ 10-15 minutes post-ROSC and prior to scene departure → acquire and transmit *additional* second 12-lead EKG, to view heart after it has recovered
  - ○ Consider putting mechanical CPR device in place for transport if available for use in case of re-arrest
  - ○ Consider mixing and hanging epinephrine or norepinephrine drip for anticipated hypotension
- ❑ Preferential transport to a STEMI/PCI receiving center, if available
- ❑ If patient's level of consciousness poses an immediate threat to the integrity of ET tube or IV access → consider sedation, per ***PROCEDURAL / POST ROSC SEDATION*** guideline.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
	EMT	
AEMT		**AEMT**
❑ Refer to ***AIRWAY MANAGEMENT***, ***VASCULAR ACCESS***, and ***FLUID THERAPY*** guidelines as needed ❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus.		❑ Refer to ***AIRWAY MANAGEMENT***, ***VASCULAR ACCESS***, and ***FLUID THERAPY*** guidelines as needed ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.** ● Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.
PARAMEDIC		**PARAMEDIC**
❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg. ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate up to 30 mcg/min to maintain SBP >100 mmHg.		❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg. ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

TACHYCARDIA (With a Pulse)

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Assess blood glucose level
- ❑ Continuous EKG, $ETCO_2$, blood pressure, and pulse oximetry monitoring when available
- ❑ Acquire and transmit a 12-lead EKG if possible.

KEY POINTS/CONSIDERATIONS

- ❑ Pregnancy >20 weeks gestation - Place wedge-shaped cushion or multiple pillows under patient's right hip.
- ❑ Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

ADULT

EMR

- ❑ Blood glucose
- ❑ Pulse oximetry monitoring

EMT

- ❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure

AEMT

SUPRAVENTRICULAR TACHYCARDIA (SVT)

- ❑ Maneuvers to increase vagal tone: Modified Valsalva, ice pack to face, Trendelenburg, etc.

PARAMEDIC

STABLE SUPRAVENTRICULAR TACHYCARDIA (SVT)

- ❑ **Adenosine**
  - **Initial dose:** 6 mg IV
  - **Additional doses:** 12 mg IV may repeat once

STABLE WIDE COMPLEX (QRS>120 msec) TACHYCARDIA

- ❑ Transport to ED with IV in place and careful monitoring

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

- ❑ Blood glucose
- ❑ Pulse oximetry monitoring

EMT

- ❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure

AEMT

SUPRAVENTRICULAR TACHYCARDIA (SVT)

- ❑ Infants: rate usually >220 bpm with no variation
- ❑ Children: rate usually >180 bpm with no variation
- ❑ Maneuvers to increase vagal tone: Valsalva, ice pack to face, Trendelenburg, urination, etc.

PARAMEDIC

STABLE SUPRAVENTRICULAR TACHYCARDIA (SVT)

- ❑ **Adenosine**
  - **Initial dose:** 0.1mg/kg IV (to max 6mg)
  - **Additional doses:** 0.2mg/kg IV (to max 12mg)

STABLE WIDE COMPLEX (QRS>120 msec) TACHYCARDIA

- ❑ Transport to ED with IV in place and careful monitoring

UNSTABLE TACHYCARDIA – SYNCHRONIZED CARDIOVERSION

- ❑ ***Signs/Symptoms of Unstable Tachycardia*** - acute cardiac chest pain, signs of heart failure, altered mental status, or signs of shock (SBP <90 mmHg, cool/pale skin)
  - Initial energy for cardioversion ***100J. Repeat doses 200J***
  - If patient is awake, alert, and peri– stable → consider sedation per ***PROCEDURAL / POST ROSC SEDATION*** guideline.

UNSTABLE TACHYCARDIA – SYNCHRONIZED CARDIOVERSION

- ❑ ***Signs/Symptoms of Unstable Tachycardia*** - acute cardiac chest pain, signs of heart failure, altered mental status, or signs of shock (SBP <90 mmHg or hypotension for age, cool/pale skin)
  - Initial energy dose is 0.5-1 J/kg
  - If no response → double energy dose to 2 J/kg
  - If patient is awake, alert, and peri– stable → consider sedation per ***PROCEDURAL / POST ROSC SEDATION*** guideline.

Medical Patient Care Guidelines

These guidelines were created to provide direction for each level of certified provider in caring for medical patients. All of these directions, dosages and provisions are subject to change with a later notice or revision of the guidelines. The OLMC physician will always be the final word on treatment in the field. If there are ever any discrepancies between the guidelines and the OLMC physician these should be documented and brought to the attention of the physician at the receiving hospital. If the explanation is not sufficient, the provider should bring the issue to their medical director or the BEMS for review.

General Approach to Medical Patient Care Guidelines

- Assess your patient prior to initiating a guideline.
- More than one guideline may apply.
- If conflicts arise between treatment guidelines → contact OLMC for clarification.
- Providers may provide treatment up to the level of their certification only.
- Air Medical Transport Service personnel function under their own clinical guidelines.
- Contact the receiving hospital and OLMC as soon as clinically possible for each patient.
- Any variations to a guideline by the OLMC physician should be clarified to ensure that the provider has properly characterized the situation.
- The OLMC physician has the final word on treatment once contact is made and may change your treatment plan.
- The OLMC physician must approve usage of dosages in excess of the guidelines.
- The order in which medications of the same class are listed is not intended to indicate hierarchy, order, or preference of administration.

General Pediatric Considerations

- Pediatric reference based tape or other medication dosing reference is preferred over calculated dosages for infants and children.

ALTITUDE RELATED ILLNESSES

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Determine history of symptoms in relation to exposure to high altitude, rate of ascent, prior altitude illness, rapidity of symptom onset.
  - Assess oxygen saturation, blood glucose, and temperature.
- ❑ Continuous cardiac monitoring; $ETCO_2$, and pulse oximetry, when available
  - Consider 12-lead EKG

Can consider the below diagnoses, but treatment should revolve around any potential underlying pathology rather than focusing solely on the altitude component of illness.

TREATMENT PLAN

- Provide supplemental oxygen to maintain peripheral oxygen saturation >90%.
- **Acute Mountain Sickness (AMS):**
  - Sx: Headache + (one or all of the following) insomnia, anorexia, nausea, fatigue
  - Descent of 1000-3300 feet may improve symptoms, but not required if symptoms are mild and no evidence of HAPE or HACE (see below)
  - Ondansetron for vomiting, acetaminophen or ibuprofen for headache
  - 20 mL/kg NS bolus
- **High Altitude Pulmonary Edema (HAPE):**
  - Sx: dyspnea, cough
  - Descent recommended, at least 3300 feet or until symptoms improve
  - O_2 supplementation. Non-Rebreather preferred, nasal cannula if vomiting
  - Use positive pressure ventilation (CPAP) if available and no contraindications
  - DO NOT give diuretics
  - Airway management as indicated
- **High Altitude Cerebral Edema (HACE):**
  - Sx: ataxia, confusion, neuro deficits, seizure, coma, and headache
  - Descent required
  - Elevate head of bed
  - Assess the need for airway protection

KEY POINTS/CONSIDERATIONS

- ❑ Altitude related illness is most commonly seen in patients who ascended to above 8000 feet above sea level without appropriate acclimatization, and unlikely in patients at altitudes <6500 feet above sea level.
- ❑ Maintain a high level of suspicion for acute exacerbation of chronic medical conditions and non-altitude related illnesses.
- ❑ HACE is rare at elevations in Utah. If AMS at high altitude → follow guidelines above, but consider all differential diagnosis for altered mental status.

ADULT

PEDIATRIC (<15 years of Age)
NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

- ❑ Blood glucose
- ❑ Pulse oximetry monitoring

EMT

❑ **CPAP/BiPAP** – Consider when the patient is awake, cooperative and SBP >90 mmHg
- Explain the procedure to the patient
- **CPAP** - Provide 10 L/min oxygen and PAP at 10 cm H2O
- **BIPAP** – Provide 10 L/min oxygen and IPAP at 10 cm H2O with EPAP at 5 cm H2O

✆ Contact OLMC to discuss further settings and treatment above the initial setup.

EMT

❑ **CPAP/BiPAP** – ONLY use when the patient is on the machine at home. Maintain home settings and bring machine with the patient.
- If unable to adequately ventilate → return to BVM

AEMT

❑ Advanced airway, CPAP, vascular access and fluid therapy

❑ Ondansetron 4mg IV/IM/PO for nausea/vomiting

✆ **Contact OLMC before terminating resuscitative efforts in the field**

AEMT

❑ Advanced airway, CPAP, vascular access and fluid therapy

❑ Ondansetron 0.1mg/kg (Max 4mg) IV/IM/PO for nausea/vomiting

✆ **Contact OLMC before terminating resuscitative efforts in the field**

PARAMEDIC

❑ May consider endotracheal intubation

ANAPHYLAXIS / ALLERGIC REACTION

ALL PROVIDERS

- ❑ Focused history and physical exam.
- ❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available.

TREATMENT PLAN

- Eliminate the source of exposure, if possible. May require moving the patient to another location
- Maintain airway
- Apply a cold pack to bite or sting site as necessary
- Monitor closely for hypotension

KEY POINTS/CONSIDERATIONS

- ❑ If the patient has any respiratory distress and is conscious → treat and transport them in a safe position of comfort
- ❑ Determine if anaphylaxis is present:
  - **Non-anaphylactic allergic reaction:** Symptoms involving only **one** organ system (i.e. itching, rash, or localized angioedema that does not involve the airway and is not associated with vomiting)
  - **Anaphylaxis:** More severe and is characterized by an acute onset involving:
    - **Hypotension** after exposure to a likely allergen
      OR
    - **Two or more** of the following occurring rapidly after exposure to a likely allergen:
      - Skin and/or mucosal involvement (urticaria, itching, face/lips/tongue swelling
      - Respiratory compromise (dyspnea, wheezing, stridor, hypoxemia)
      - Persistent gastrointestinal symptoms, particularly in infants/young children (vomiting, abdominal pain)
- ❑ **EPINEPHRINE IS THE PRIMARY TREATMENT FOR SUSPECTED ANAPHYLAXIS/ SEVERE ALLERGIC REACTION. Do not delay administering epinephrine.**

ADULT

EMR

- ❑ If patient prescribed (give or assist):
  - **Epinephrine auto injector (0.3 mg) IM/nasal epinephrine device**
- ❑ Pulse oximetry monitoring
- ❑ O_2 as needed to maintain SpO_2 above 90%

EMT

- ❑ **Epinephrine 0.5mg IM** (0.5 mL of 1 mg/mL) for anaphylaxis.
- ❑ May repeat epinephrine dose every 5 minutes as needed
- ❑ For **WHEEZING**:
  - **Albuterol** 2.5 mg/3ml NS nebulized every 10 minutes until symptoms improve

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

- ❑ If patient prescribed (give or assist):
  - **Epinephrine auto injector ("Jr." 0.15 mg) IM/nasal epinephrine device**
- ❑ Pulse oximetry monitoring
- ❑ O_2 as needed to maintain SpO_2 above 90%

EMT

- ❑ **Epinephrine 0.01mg/kg max dose 0.3 mg** IM.
  - If >25 kg, then give 0.3 mg IM
- ❑ May repeat epinephrine dose every 5 minutes, as needed
- ❑ For **WHEEZING**:
  - **Albuterol** 2.5 mg/3ml NS nebulized every 10 minutes until symptoms improve

AEMT

- ❑ **Diphenhydramine** 1 mg/kg (Max 50 mg) IV/IO/IM for allergic reaction with urticaria/itching
- ❑ If **STRIDOR** is present:
  - **Epinephrine (1 mg/mL) 2mg** mixed with 3 mL of NS, nebulized every 10 minutes until symptoms improve
- ❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP >100 mmHg.

AEMT

- ❑ **Diphenhydramine** 1 mg/kg (Max of 50 mg) IV/IO/IM for allergic reaction with urticaria/itching
- ❑ If **STRIDOR** is present:
  - **Epinephrine (1 mg/mL) 2mg** mixed with 3 mL of NS, nebulized every 10 minutes until symptoms improve
- ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.**
  - Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

BEHAVIORAL EMERGENCY

ALL PROVIDERS

❑ **Scene management**
- If the patient is determined to be a threat to EMS providers, themselves, or others *OR* if assistance with patient control is otherwise needed → contact Law Enforcement.
- Remove patient from the stressful environment and remove any possible weapons from scene.
- Before touching any patient that has been Taser'd, ensure law enforcement has disconnected the wires from the hand-held unit.

❑ Focused history and physical exam
- Blood glucose, temperature, oxygen saturation, assessment, cardiac monitoring, and ETC02 monitoring for any sedated patient
- Always assess for a possible medical condition, exposure or trauma including possible abuse.
- Note medications/substances on scene that may contribute to the agitation, or may be for treatment of a relevant medical condition

TREATMENT PLAN
- **Taser'd patient:** Removal of Taser probes
  - EMS providers may remove probes that are not embedded in the face, neck, groin, breast, or spinal area.
  - To remove probes:
    - Place one hand on the patient in the area where the probe is embedded and stabilize the skin surrounding the puncture site. Place other hand firmly around the probe.
    - In one fluid motion, pull the probe straight out from the puncture site
    - Repeat procedure with second probe
    - The following patients should be transported to an Emergency Department for evaluation:
      - Patient with probes embedded in the face, neck, groin, breast, or spinal area
      - Patient with significant cardiac history
      - Patient having ingested stimulants (including methamphetamines, phencyclidine/PCP, cocaine, spice, bath salts, designer drugs, etc)
      - Patients exhibiting bizarre behavior or those with abnormal vital signs including end-tidal C02

KEY POINTS/CONSIDERATIONS

❑ Chemical restraint should be considered for patients that cannot be calmed by non-pharmacologic methods and who are a danger to EMS providers, themselves, or others.
- Extreme caution, careful assessment of medical capacity, and consultation with OLMC should be utilized when considering sedation for non-combative patients refusing transport, per ***PROCEDURAL / POST ROSC SEDATION*** guideline.

❑ Selection of chemical restraint medications should be based upon the patient's age, medical history, clinical condition, current medications, and allergies. Consult OLMC when necessary to assist in the selection of medications in difficult cases.

❑ It is preferable to choose ONE drug for management of agitation and maximize dosing of that medication prior to adding another medication.

❑ If the patient has taken narcotics or alcohol *OR* is >65 yo (e.g. begin with 50% of the recommended initial dose to assess response) → consider a reduction in the initial dosage of chemical restraint medications.

❑ **FSED Behavioral Health patients with Agitation** should be taken to a full Hospital Emergency Department. A good general rule is that if you or the police have any difficulties managing the patient in the field → they should go to the Main ED in a Full Hospital.

❑ Appropriate patients, without medical emergencies, may be transported to a mental health receiving facility if available, as per receiving center guidelines.

The order in which medications are listed below is not intended to indicate hierarchy, order, or preference of administration.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
	EMT	

❑ Attempt to calm or gently restrain the patient with verbal reassurance. Engage the assistance of any family or significant others in the process.

AEMT

❑ Vascular access and fluid therapy

❑ **Benzodiazepines**: if the patient is under the influence of narcotics or alcohol → cut dose in half

❑ **Diazepam**
- **IV/IO** 5 mg every 10 min to the desired effect or max dosage of 20 mg
- **IM** 10 mg once (IM not preferred, unless no other options)

❑ **Lorazepam**
- **IV/IO** 2 mg every 5 min to the desired effect or max dose of 4 mg
- **IM** 4 mg once

❑ **Midazolam**
- **IV/IO** 2.5 - 5 mg, may repeat once in 10 minutes, if needed. Total max dose: 10mg
- **IN/IM** 5 mg, may repeat once in 10 minutes, if needed. Total max dose: 10mg

AEMT

❑ Vascular access and fluid therapy

❑ **Benzodiazepines**: if the patient is under the influence of narcotics or alcohol → cut dose in half

❑ **Diazepam**
- **IV/IO** 0.1 mg/kg (max 5 mg), may repeat once in 10 minutes, if needed. Total max dose: 10 mg
- **IM** 0.2 mg/kg (max 10 mg) once (IM not preferred unless no other options)

❑ **Lorazepam**
- **IV/IO** 0.05 mg/kg (max 2 mg), may repeat once in 10 minutes, if needed. Total max dose: 4 mg
- **IM** 0.05 mg/kg (max 4 mg) once

❑ **Midazolam**
- **IV/IO** 0.1 mg/kg (max 5 mg), may repeat once in 10 minutes, if needed. Total max dose: 10 mg
- **IN/IM** 0.2 mg/kg **(**max 5 mg), may repeat once in 10 minutes, if needed. Total max dose: 10 mg

PARAMEDIC

❑ **Haloperidol**
- **IM** 5 - 10mg once
- **IV/IO** 2 - 5 mg once

❑ **Ketamine**
- **IM** 4 mg/kg once
- **IV/IO** 1 mg/kg once

PARAMEDIC

DROWNING OR SUBMERSION

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Blood glucose, core body temperature and oxygen saturation assessment
  - Assess the scene for other environmental issues or possible toxins.
- ❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure, and pulse oximetry, when available.

TREATMENT PLAN

- Safely remove patient from the water
- Place patient supine
- Remove wet clothing and wrap in blankets
- Ensure patient warmth
- Scuba divers "Dive Computer" or Dive Log Book should be transported with the patient.

KEY POINTS/CONSIDERATIONS

- ❑ Airway maintenance is the primary consideration.
- ❑ If available, PEEP valve and a manometer. PEEP GOAL: 5-8 cm H_2O
- ❑ Unlike the "CAB" strategy used in standard cardiac arrest, **patients suffering cardiac arrest from drowning require an "ABC" approach** with emphasis on prompt airway management and supplemental ventilation.
  - Initiate 5 rescue breaths followed by 30 chest compressions, then use a 30:2 compression: ventilation ratio for adults or 15:2 ratio for children
- ❑ There can be co-existing conditions depending on the type of submersion injury including trauma, hypothermia, and intoxication.
- ❑ Hypotension is associated with a worse outcome, monitor closely and treat with ***SHOCK, SEPSIS, & FLUID THERAPY*** guideline
- ❑ Initiation of in-water ventilations may increase survival; however, in-water chest compressions are futile.
- ❑ Submersion in cold water will often cause severe hypothermia, notify the receiving hospital so that appropriate resources can be mobilized.
  - For hypothermic patients, please refer to ***TEMPERATURE AND ENVIRONMENTAL EMERGENCY*** guideline.
  - Cardiac arrest due to drowning and hypothermia [temperature <86°F (30°C)] → consider direct transport to ECMO center and DO NOT rewarm the patient
    - <15 years: Salt Lake Primary Children's Medical Center
    - >15 years: University of Utah Medical Center or Intermountain Medical Center

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	

- ❑ Pulse oximetry monitoring
- ❑ If breathing spontaneously → apply oxygen at 15 LPM via non-rebreather mask to maintain oxygen saturations >95%
- ❑ Ventilate with BVM when apneic or exhibiting respiratory distress
- ❑ Consider need for airway adjunct

	EMT	

- ❑ For **WHEEZING**:
  - **Albuterol** 2.5 mg/3ml NS nebulized

AEMT

- ❑ Advanced airway, vascular access and fluid therapy
  - **Albuterol** 2.5 every 10 minutes via nebulization for bronchospasm/wheezing until symptoms subside
  - Reassess patient after each dose to determine need for additional dosing
- ❑ Consider CPAP in awake patients with respiratory distress
- ❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP >100 mmHg.

AEMT

- ❑ Advanced airway, vascular access and fluid therapy
  - **Albuterol** 2.5 every 10 minutes via nebulization for bronchospasm/wheezing until symptoms subside. If age <1yr → start with 1.25 mg
  - Reassess patient after each dose to determine need for additional dosing
- ❑ Consider CPAP in awake patients with respiratory distress
- ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.**
  - Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

FEVER MANAGEMENT

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Assess & document temperature.
- ❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available.
- ❑ Assess for sepsis. Reference ***SHOCK, SEPSIS, & FLUID MANAGEMENT*** guideline

TREATMENT PLAN

- If temperature is >100.4°F (>38.0°C) and the patient does not have any contraindications → consider antipyretic medications.
  - Ibuprofen & acetaminophen can be co-administered
  - Ibuprofen is contraindicated in children <6 months old and pregnant patients
- For temperatures >103°F (39.5°C)
  - Begin passive cooling techniques including removing excess clothing.
- For temperatures >105°F (41°C)
  - Refer to the ***TEMPERATURE & ENVIRONMENTAL EMERGENCY*** guideline.

ADULT	PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring	
EMT	**EMT**
❑ **Acetaminophen** 500-1000 mg PO single dose only ❑ **Ibuprofen** 600 mg PO single dose only	❑ **Acetaminophen** 15 mg/kg (max 650mg) PO *OR* rectum once ❑ **Ibuprofen** 10 mg/kg (max 600mg) PO once ● ***Contraindicated in children <6 months old***
AEMT	**AEMT**
❑ Advanced Airway, IV/IO Access, and Fluid Therapy ❑ **Acetaminophen** 500-1000 mg IV	❑ Advanced Airway, IV/IO Access, and Fluid Therapy ❑ **Acetaminophen** 15 mg/kg (max 650mg) IV
PARAMEDIC	**PARAMEDIC**

HYPOGLYCEMIA / HYPERGLYCEMIA

ALL PROVIDERS

❑ Focused history and physical exam
- Blood glucose assessment (heel stick is preferred in newborns or infants).
- Hypoglycemia is defined as blood glucose level <50 mg/dl for adults, <60 mg/dl for children, and <40 mg/dl for the term neonate (<30 days of age) with any degree of altered mentation.

TREATMENT PLAN
- If insulin pump in place: Hypoglycemic patient with altered mentation -
  - Care is directed at treating hypoglycemia first, then stopping administration of insulin.
    - Turn off insulin pump, if able.
    - If no one familiar with the device is available to assist → disconnect pump from patient by either:
      - Use a quick-release where the tubing enters the dressing on patient's skin.
      - Completely remove the dressing, thereby removing the subcutaneous needle and catheter from under the patient's skin.
  - When mental status returns to normal, patient should be strongly encouraged to eat.
- If *ALL* below criteria are met → may consider scene release (non-AMA disposition) of hypoglycemic patient
  - Patient does not want to be transported.
  - Return to apparent normal mental capacity following treatment.
  - Repeat blood glucose after treatment >70.
  - Known diagnosis of diabetes.
  - The patient is not taking oral antihyperglycemic (e.g. Glyburide or Glipizide) medications for diabetes.
  - No evidence of self-harm or suicide attempt
  - There is at least one responsible party that can assist them in their recovery and is comfortable in their care.
  - It is recommended that children be transported for further evaluation and observation.

KEY POINTS/CONSIDERATIONS

❑ Do NOT attempt to give oral glucose to those who are unconscious, cannot swallow or whose gag reflex is diminished.

❑ Transport any patient who is at risk for prolonged or recurrent hypoglycemia such as long acting insulin or oral hypoglycemic overdose.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
EMT		**EMT**
❑ If patient is able to protect airway → **Oral glucose** 15 grams ● Repeat in 15 minutes as needed		❑ If patient is able to protect airway → **Oral glucose** 7.5 grams ● Repeat in 15 minutes as needed

AEMT

❑ Vascular access and fluid therapy

HYPOGLYCEMIA

❑ **Dextrose 10%:** Infuse **125 mL** (12.5 grams), then recheck blood sugar. If repeat blood glucose <70 → may repeat 125 mL dose.

❑ **Dextrose 50% 12.5 grams** (25mL) IV/IO. May repeat as necessary

❑ **Glucagon 1 mg** IM if no IV/IO access available. May repeat in 15min once.

HYPERGLYCEMIA (BS >300 mg/dL)

❑ **NS 1000 mL** IV/IO over 30–60 minutes

PARAMEDIC

AEMT

❑ Vascular access and fluid therapy

HYPOGLYCEMIA

❑ Infants up to 1 year
- **Dextrose 10% 5 mL/kg** (0.5 grams/kg) IV/IO. May repeat as necessary up to a MAX of 125 mL (12.5 grams).

❑ Children >1 year
- **Dextrose 10% 5 mL/kg** (0.5 grams/kg) IV/IO. May repeat as necessary up to a MAX of 125 mL (12.5 grams).
- **Glucagon 0.01 mg/kg (max dose of 1 mg)** IM if no IV/IO access available

HYPERGLYCEMIA (BS >300 mg/dL)

❑ **NS 20 mL/kg IV/IO** (Max 1 Liter) over 30–60 minutes

PARAMEDIC

OBSTETRICAL EMERGENCY

ALL PROVIDERS

❑ Focused history and physical exam
- Do NOT perform pelvic exam

❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available.

TREATMENT PLAN

- Active Labor without evidence of imminent delivery
  - Transport to the closest facility with supportive care
- **Imminent Deliveries:**
  - Consider delaying transport until after normal delivery procedures
  - As delivery occurs
  - Check for cord around the infant's neck
    - If present → slip the cord over the infant's head
    - If unable to free the cord → double clamp the cord and cut between the clamps
  - Do not suction nose and mouth. Wipe nose and mouth to clear excess secretions
  - Place one umbilical cord clamp 2 inches away from baby, place second clamp 2 inches further, cut cord between the clamps.
  - Consider delaying cord-clamping for ~60 seconds or until the END of sensation of pulsation
  - **Immediately following cord clamping, administer Pitocin (Oxytocin) 10 units IM**
  - Keep the newborn warm and dry with vigorous stimulation.
  - Allow infant to nurse (unless multiple births when babies should not be allowed to nurse until all have been delivered)
  - Calculate APGAR score at 1 minute and again at 5 minutes

Apgar Score

Gestational age_____weeks

Sign	0	1	2	1 minute	5 minute	10 minute	15 minute	20 minute
Color	Blue or Pale	Acrocyanotic	Completely Pink					
Heart rate	Absent	<100 minute	>100 minute					
Reflex irritability	No Response	Grimace	Cry or Active Withdrawal					
Muscle tone	Limp	Some Flexion	Active Motion					
Respiration	Absent	Weak Cry; Hypoventilation	Good, Crying					
			Total					

Comments:

Resuscitation

Minutes	1	5	10	15	20
Oxygen					
PPV/NCPAP					
ETT					
Chest Compressions					
Epinephrine					

❑ ***SPECIAL CIRCUMSTANCES*** – ALL of which → **TRANSPORT TO THE CLOSEST HOSPITAL**
- **Excessive hemorrhage (>500ml)** *FOLLOWING* delivery or delayed placenta delivery
  - Begin fundal massage immediately after placental delivery
  - Pregnancy >20 weeks gestation - Transport in partial left lateral decubitus position. Place wedge-shaped cushion or multiple pillows under patient's right hip and shoulders to elevate R side 30-45°
  - Allow infant to nurse
  - High Flow O_2
  - Oxytocin
  - Tranaxemic acid
  - Blood transfusion (if available)
- **Prolapsed cord or limb presentation** (cord or limb out of the vagina before the baby)

        - DO NOT ATTEMPT DELIVERY
    - Maintaining a pulsatile cord is the objective: insert two fingers of gloved hand into vagina to raise the presenting portion of the newborn off the cord.
    - If able → place the mother in Trendelenburg position. Otherwise, use knee-chest position.
    - Keep cord moistened with sterile saline.
    - Continue to keep pressure off cord throughout transport.
- **Breech presentation** (coming buttocks first)
    - Position mother with her buttocks at edge of bed, legs flexed.
    - Support the baby's body as it delivers.
    - As the head passes the pubis, apply gentle upward pressure until the mouth appears over the perineum. Immediately suction mouth, then nose.
    - If the head does not deliver, but newborn is attempting to breathe → place gloved hand into the vagina, palm toward the newborn's face, forming a "V" with the index and middle finger on either side of the nose. Push the vaginal wall from the face to create an airway. Maintain position throughout transport.
- **Shoulder Dystocia** (head is out but shoulder will not pass)
    - Position mother with buttocks off the edge of the bed and thighs flexed upward as much as possible.
    - Apply firm, open hand pressure above the symphysis pubis.
    - If delivery does not occur → maintain airway patency as best as possible, immediately transport.
- **Stillborn/Abortion**
    - All products of conception should be carefully collected and transported with the mother to the hospital. Anything other than transport should be coordinated with on-line medical consultation and/or law enforcement.
- **Cardiac Arrest**
    - Perform manual displacement of the uterus to the patients left. If unable to perform manual displacement → place wedge-shaped cushion or multiple pillows under patient's right hip to achieve 30° lateral tilt.
    - Transport pregnant patients to the nearest emergency department without delay while attempting to provide continuous compressions and defibrillation (if applicable). There is potential to perform an emergency cesarean section in the ED, which may save the fetus and the mother.
- **Trauma** (pregnancies of at least 20 weeks' gestation)
    - EMS clinicians should be aware that signs of hemorrhagic shock may be subtle or delayed in injured pregnant patients.
    - For any abdominal pain, even after minor trauma, consider transport to trauma center
    - EMS clinicians should consider the possibility of intimate partner violence when caring for injured pregnant patients.

KEY POINTS/CONSIDERATIONS

- ❑ **FSED Pregnancy**: Unless a precipitous birth is imminent or stabilization is required before going to a main ED facility, *any pregnancy problem in a pregnancy >16 weeks or with unstable vital signs, including newborn children and their mothers, should be taken to a full hospital with a Labor and Delivery area*.
- ❑ Attempt to create a sanitary environment
- ❑ Transport in left lateral decubitus position

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
EMT		**EMT**
❑ Assist with normal childbirth		
AEMT		**AEMT**
❑ Reference ***SHOCK, SEPSIS, & FLUID THERAPY*** guideline		❑ Reference ***SHOCK, SEPSIS, & FLUID THERAPY*** guideline
❑ Treat seizures as per ***SEIZURE*** guideline		❑ Treat seizures as per ***SEIZURE*** guideline
❑ **Oxytocin** 10 units IM after newborn delivery, and confirmation there are no additional babies. If unsure → contact medical control or do not administer.		

PARAMEDIC

- ❑ Pregnant females with eclampsia/seizures
  - **Magnesium sulfate -** 5 gm IV, given over 15 to 30 min.
- ❑ **If bleeding continues → Oxytocin Infusion *may* be started:**
  - IM 10 units followed by IV/IO Infusion by adding 10 units to 500mL or 20 units to 1000mL NS.
  - Start infusion at 250 ml/hr and titrate the infusion to decrease bleeding and patient comfort
- ❑ **Tranexamic Acid (TXA)** 1 gram IV slow push/drip over 10 minutes if within 3 hours of delivery for postpartum hemorrhage. If bleeding continues after 30 minutes → may give additional 1g
- ❑ If evidence of hemorrhagic shock → treat according to the ***BLOOD PRODUCT AND TRANSFUSION*** guideline.

✆ In the event of uterine inversion, cover uterus with moistened sterile gauze. Contact OLMC for surgical preparations.

PARAMEDIC

- ❑ Refer to the ***NEWBORN RESUSCITATION*** guideline.
- ❑ If <18 years of age but requiring treatment for complications of pregnancy → treat per adult guidelines

OPTIONAL ORDERS BY OLMC ONLY

✆ **High-risk preterm labor when delivery is imminent:**
(1) Rapidly infuse 1 liter of NS
(2) **Albuterol** 2.5 mg via nebulization
(3) **Magnesium Sulfate** 1 gram IV and titrate per OLMC

OPIOID OVERDOSE

ALL PROVIDERS

❑ Focused history and physical exam
- Assess blood glucose, temperature, and oxygen saturation.
- Assess the time and circumstances of the ingestion.
- Assess patient and scene for possible trauma and additional information on possible toxins, poisons, medications or other related concerns.

❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available.
- 12-lead EKG, if available

TREATMENT PLAN
- **Opioid Overdose:** Initial focus is on providing/assisting with adequate ventilation with BVM immediately.
- Initial dose of naloxone should be given IN (intranasal) while preparing for IV placement by AEMT/PM.
- Dosing of naloxone should be focused on restoration of adequate spontaneous ventilation, not restoration of full consciousness. Excessive naloxone use can precipitate an acute withdrawal syndrome, putting both the patient and the emergency personnel at risk for injury.
- Begin with small doses of naloxone (0.4 mg IN/IV) and titrate to adequate spontaneous ventilation.

❑ **Release on Scene**
- Patients who have sustained an opioid overdose and upon naloxone dose, demonstrate capacity to make appropriate decisions, GCS 15 and have personnel present to supervise, can be released on scene. There are exceptions to release are listed below.
- Transport any pill bottles, open containers, or potential chemicals that may have been ingested.
- Transport suicide notes or other pre-ingestion communications.
- All **ORAL** opioid overdoses should be transported, as re-sedation will occur after naloxone administration.
- With some opiates (e.g. fentanyl and buprenorphine), very large doses of naloxone may be required to restore respirations. If no results with 2-3x 0.4 mg doses → consider a trial of 2 mg doses.
- If other drugs are ingested in addition to opiates (such as alcohol or benzodiazepines) → the response to naloxone may be incomplete.
- Patients who have attempted suicide by overdose **CANNOT** be released and **MAY** be taken in against their will. Police may need to assist in ensuring the transport by providing a "pink sheet" and assisting with patient control during transport.

KEY POINTS/CONSIDERATIONS

❑ May contact **Poison Control 1-800-222-1222** for questions or unusual overdoses

ADULT | **PEDIATRIC (<15 years of Age)**
NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

❑ Blood glucose
❑ Pulse oximetry monitoring
❑ **Naloxone** IN metered dose - for suspected opioid overdose. May repeat as necessary to maintain respirations.
- 3-8mg using a commercial device in a single nostril every 2-3 minutes

EMT

- ❑ **Naloxone** 0.4–2 mg (per dose) IN for suspected opioid overdose. May repeat as necessary to maintain respirations.
  - IN: using 1 mg/ml solution for injection - 2 mg nasally every 2-3 minutes
    - 3-8mg using a commercial device in a single nostril every 2-3 minutes
  - If unable to administer IN → IM route may be used
    - IM/SubQ using an auto injector- 5mg every 2-3 minutes
    - Note max volume for IM = 3-5mL depending on the muscle used to administer

AEMT

- ❑ Advanced airway, vascular access and fluid therapy
- ❑ **Naloxone** 0.4–2 mg (per dose) IV/IM/IO/IN for suspected narcotic overdose. May repeat as needed.
  - IV/IO/IM- 0.4mg–2mg, may repeat with escalating doses every 2-3 minutes
    - Note max volume for IM=3-5mL depending on the muscle used to administer
- ❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus.

PARAMEDIC

- ❑ **Sodium bicarbonate** 1 mEq/kg slow IV/IO push for tricyclic antidepressant overdose with sustained HR >120 bpm, QRS >0.10, hypotension unresponsive to fluids, or ventricular dysrhythmias
- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate up to 30 mcg/min to maintain SBP >100 mmHg.

EMT

- ❑ **Naloxone** 0.1 mg/kg (max 2 mg per dose) IN for suspected opioid overdose. May repeat as needed to maintain respirations.
  - Using 1 mg/ml solution for injection = 2 mg nasally every 2-3 minutes
- ❑ If unable to administer IN → IM route may be used

AEMT

- ❑ Advanced airway, vascular access and fluid therapy
- ❑ **Naloxone** 0.1 mg/kg (max 2 mg per dose) IV/IM/IO/IN for suspected narcotic overdose. May repeat as needed.
- ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.**
  - Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

✆ **Sodium bicarbonate** for tricyclic antidepressant overdose → Contact OLMC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

RESPIRATORY DISTRESS

ALL PROVIDERS

- ❑ Focused history and physical exam:
- ❑ Determine the need to treat under the ***ANAPHYLAXIS / ALLERGIC REACTION*** guideline
- ❑ Determine the need to treat under the ***CONGESTIVE HEART FAILURE*** guideline
- ❑ Assess blood glucose, temperature and oxygen saturation
- ❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available
  - Consider a 12-lead EKG

TREATMENT PLAN

- **Choking**: Attempt to alleviate any obvious obstructions to the airway.
  - Infants apply a sequence of 5 back blows and 5 chest thrusts until the item is dislodged
  - Adults and children use the abdominal thrust ("Heimlich") maneuver.
- Maintain airway, administer 10-15 Lpm of oxygen via NRB

KEY POINTS/CONSIDERATIONS

- ❑ Recall that infants and small children are primarily nose breathers & consider oral and nasal suctioning for copious secretions.
- ❑ Keep patient NPO for any respiratory distress, and especially for children with a RR >60.
- ❑ **Pediatric Suctioning**
  - Infants and young children require a clear nose for effective breathing. Suctioning oral and nasal passages are essential in management in respiratory distress
  - Using an 8 Fr soft catheter, clear each nostril (suction for <10 seconds per nare)
  - If distress persists → lubricate the nare with 1-2 drops of saline and suction to the depth from the tip of the child's nose to their ear lobe.
  - Suction while withdrawing, use a twisting motion, for <10 seconds per nare

ADULT

EMR

- ❑ Blood glucose
- ❑ Pulse oximetry monitoring

EMT

WHEEZING

- ❑ **Albuterol** 2.5 mg/3ml NS nebulized every 10 minutes until symptoms improve
- ❑ **CPAP/BiPAP** – Consider when the patient is awake but needs assistance with oxygenation and ventilation such as in a CHF/Pulmonary Edema patient or COPD patient.
  - Explain the procedure to the patient
  - Initially apply the mask and begin the CPAP or BiPAP according to training instructions.
  - CPAP - Provide 10 L/min oxygen and PAP of 5 cm H2O to begin.
  - BiPAP – Provide 10 L/min oxygen and IPAP at 15 cm H2O with EPAP at about 5 cm H2O

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

EMT

WHEEZING

- ❑ **Albuterol** 2.5 mg/3ml NS nebulized every 10 minutes until symptoms improve
- ❑ **CPAP/BiPAP** – ONLY use when the patient is on the machine at home. Maintain home settings and bring machine with the patient. If unable to adequately ventilate → return to BVM or advance to intubation

AEMT

- ❑ Advanced airway, vascular access and fluid therapy

ANAPHYLAXIS

- ❑ See ***ANAPHYLAXIS/ALLERGIC REACTION*** guideline

WHEEZING

- ❑ **Albuterol** 2.5 mg/3cc NS nebulized every 10 minutes until symptoms improve
- ❑ **Ipratropium** 0.5mg x1 nebulized treatment every 20 minutes with a max of 2 doses.
  - Check packaging to confirm if Ipratropium and Albuterol are already combined. Ipratropium and Albuterol may be combined to make a product similar to Duoneb.
- ❑ Patient respiratory status must be reassessed after each dose to determine need for additional treatment
- ❑ **Epinephrine 0.5 mg (1mg/mL) IM** every 20 minutes as needed for acute severe asthma unresponsive to multiple doses of inhaled beta-agonists

STRIDOR

- ❑ **Epinephrine (1mg/mL) 2 ml (2mg)** mixed with 3mL of NS nebulized
- ❑ **CPAP/BiPAP** – Consider when the patient is awake but needs assistance with oxygenation and ventilation such as in a CHF/Pulmonary Edema patient or COPD patient.
  - Explain the procedure to the patient
  - Initially apply the mask and begin the CPAP or BiPAP according to training instructions.
  - CPAP - Provide 10 L/min oxygen and PAP of 5 cm H2O to begin.
  - BiPAP – Provide 10 L/min oxygen and IPAP at 15 cm H2O with EPAP at about 5 cm H2O

PARAMEDIC

- ❑ **Magnesium sulfate** 2gm IV over 15-30 minutes for severe wheezing unresponsive to albuterol
- ❑ For patients not tolerating CPAP/BiPAP Consider Procedural related anxiety management (refer to the ***BEHAVIORAL EMERGENCY*** guideline)

✆ Contact OLMC to discuss further settings and treatment above the initial setup.

AEMT

- ❑ Advanced airway, vascular access and fluid therapy

ANAPHYLAXIS

- ❑ See ***ANAPHYLAXIS/ALLERGIC REACTION*** guideline

WHEEZING

- ❑ **Albuterol** 2.5 mg/3ml NS nebulized every 10 minutes until symptoms improve
- ❑ **Ipratropium** 0.5mg x 1 nebulized treatment for children 5 and older, 0.25 for <5 years old. Give doses every 20 minutes with a max of 2 treatments.
  - For infants <1yr: if wheezing persists after nasal suctioning → **albuterol 2.5 mg** nebulized
- ❑ **Epinephrine IM (1mg/mL) 0.01 mg/kg (Max 0.3 mg)** every 20 minutes as needed for acute severe asthma unresponsive to inhaled beta-agonist

STRIDOR

- ❑ **Epinephrine (1mg/mL) 2mL (2mg)** added to 3mL of NS via nebulizer
- ❑ **CPAP/BiPAP** – ONLY use when the patient is on the machine at home. Maintain home settings and bring machine with the patient. If unable to adequately ventilate → return to BVM or advance to intubation

✆ Patient respiratory status must be reassessed after each dose to determine need for additional treatment. Call OLMC for additional doses.

PARAMEDIC

- ❑ **Magnesium sulfate** 50 mg/kg (max 2 gm) IV over 15-30 minutes for severe wheezing unresponsive to albuterol

SEIZURES

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Blood glucose, temperature and oxygen saturation assessment
  - If appropriate → determine possibility of third trimester pregnancy,
  - Assess scene for possible toxin, overdose or trauma
- ❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available

TREATMENT PLAN

- Do not restrain, but do provide protection from injury during the tonic-clonic phase
- Consider spinal motion restrictions
- Ensure patients experiencing febrile seizures are not excessively dressed or bundled
- Any child <12 months old with seizure activity should be encouraged to be transported

KEY POINTS/CONSIDERATIONS

- ❑ Intranasal (IN) and intramuscular (IM) routes are preferred for first line administration of benzodiazepines
- ❑ Intravenous (IV) administration of benzodiazepines is appropriate once an IV is in place
- ❑ Rectal administration is not recommended

The order in which medications are listed below is not intended to indicate hierarchy, order, or preference of administration.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	

- ❑ Blood glucose
- ❑ Pulse oximetry monitoring
- ❑ Maintain open airway with patient in the recovery position, consider need for airway adjuncts
- ❑ Assist patient's family or caretaker with any home medication treatments

EMT

AEMT

- ❑ Airway management, vascular access and fluid therapy
- ❑ **Benzodiazepines**: if the patient is under the influence of narcotics or alcohol → cut dose in half
  - **Diazepam**
    - **IV/IO** 5 mg, may repeat every 5 minutes, if needed. Total max dose: 20mg
    - **IM** 10 mg**,** may repeat once in 10 minutes, if needed. Total max dose: 20 mg (IM not preferred unless no other options)
  - **Lorazepam**
    - **IV/IO/IM** 4 mg, may repeat every 5 minutes, if needed. Total max dose: 8 mg
  - **Midazolam**
    - **IN/IV/IO** 5 mg, may repeat once in 10 minutes, if needed. Total max dose: 10 mg
    - **IM** 10 mg. If unable to establish IV/IO → may repeat once after 10 minutes

✆ Contact OLMC for dosages above those provided or use of medication NOT fitting the guideline parameters.

PARAMEDIC

- ❑ Pregnant females with eclampsia/seizures
  - **Magnesium sulfate -** 5 gm IM/IV/IO gm. Give infusion over 15 to 30 min.

AEMT

- ❑ Airway management, vascular access and fluid therapy
- ❑ **Benzodiazepines**: if the patient is under the influence of narcotics or alcohol → cut dose in half
  - **Diazepam**
    - **IV/IO** 0.1 mg/kg (max 5 mg), may repeat every 5 minutes, if needed. Total max dose: 10 mg
    - **IM** 0.2 mg/kg (max 10 mg), may repeat every 10 minutes, if needed. Total max dose: 20 mg (IM not preferred unless no other options)
  - **Lorazepam**
    - **IV/IO/IM** 0.1mg/kg (max 4 mg per dose), may repeat every 5 minutes, if needed. Total max dose: 8 mg.
  - **Midazolam**
    - **IV/IO** 0.1 mg/kg (max 5 mg), may repeat once in 10 minutes, if needed. Total max dose: 10 mg
    - **IN/IM** 0.2 mg/kg (max 10 mg), once.

✆ Contact OLMC for dosages above those provided or use of medication NOT fitting the guideline parameters.

PARAMEDIC

- ❑ Pregnant females with eclampsia/seizures
  - **Magnesium sulfate -** 5 gm IM/IV/IO gm. Give infusion over 15 to 30 min.

✆ Contact OLMC after medication is given.

SUSPECTED STROKE

ALL PROVIDERS

❑ Focused history and physical exam
- Blood glucose, temperature and oxygen saturation assessment.
- Keep NPO
- Document symptom onset time or time last seen normal.

❑ Continuous cardiac monitoring; blood pressure, $ETCO_2$, and pulse oximetry monitoring when available
- 12-lead EKG, if available and *DOES NOT* DELAY transport.

TREATMENT PLAN

- Perform **Cincinnati Stroke Scale (CSS)** to determine if a stroke is likely present and severity of stroke.
  - **Cincinnati Stroke Scale (CSS)**:
    - Facial droop = 1 point
    - Arm weakness = 1 point
    - Speech deficit = 1 point
- Determine **Last Known Well (LKW)** time (the time when the patient was last seen without new stroke symptoms)
- A **Large Vessel Occlusion (LVO)** stroke is more likely if **CSS** = 3. The patient may be eligible for endovascular thrombectomy (direct clot removal) in addition to IV thrombolytic (Thrombolytic: alteplase/tenecteplase).

❑ **Destination guidelines for stroke patients:**
- Types of stroke facilities and treatments offered:
  - **SRF**: Stroke Receiving Facility (IV Thrombolytic)
  - **PSC**: Primary Stroke Center (IV Thrombolytic)
  - **TSC**: Thrombectomy-Capable Stroke Center (IV Thrombolytic & thrombectomy)
  - **CSC**: Comprehensive Stroke Center (IV Thrombolytic & thrombectomy)
- **If CSS is 1 or 2** → transport to closest stroke center (**SRF/PSC/TSC/CSC**)
- **If CSS is 3** *AND* you will arrive at the destination hospital within:
  - 0-4 hours since **LKW** → Transport to nearest IV Thrombolytic-capable hospital (with pre-notification and possible **LVO** transport protocol activated by hospital).
  - 4-24 hours since **LKW** → Transport to thrombectomy-capable center (**TSC/CSC**) *if no more than 30 minutes of added transport time* over transport to a closer **SRF / PSC**.
  - >24 hours since **LKW** → Transport to closest stroke center
- Consider air medical transport to facilitate rapid transport when needed.
- Acquire the cell phone number of family members/next of kin to provide to clinicians so they can call them and ask questions if needed.
- Alert the receiving emergency department that you are transporting a suspected stroke patient as soon as you have made a destination decision. Inform them of the patient's CSS score and of their presenting symptoms as well as the patient LKW time.

❑ **Pediatric Considerations**
- Children can have strokes too. Some risk factors include; sickle cell disease, congenital and acquired heart disease, head and neck infections, systemic conditions, (e.g. inflammatory bowel disease and autoimmune disorders), head trauma or dehydration. Children with acute stroke are also potentially eligible for IV Thrombolytic and thrombectomy so should follow the same protocol as above.

❑ **FSED Stroke:** The FSEDs can obtain a CT scan and a CT angiogram of the head and neck, identifying the type of stroke and quickly administering thrombolytics, if indicated. All confirmed stroke patients will require transfer to an appropriate stroke center based on the patient findings. Consider transport to thrombectomy-capable stroke center or comprehensive stroke center for CSS 3-4 and time since LKW 4- 24 hours.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	

❑ Blood glucose
❑ Apply oxygen to maintain oxygen saturation 90 - 95%
❑ Evaluate and Document **Cincinnati Stroke Scale (CSS)** during assessment. If *ANY* of following are abnormal → scale is positive and a stroke is likely:
- **Facial Droop**
  - Normal: Both sides of face move equally
  - Abnormal: One side of face does not move as well as the other (or not at all; 1 point)
- **Arm Drift**
  - Normal: Both arms move equally
  - Abnormal: One arm does not move, or drifts down compared to the other, or both arms do not move at all (1 point)
- **Speech**
  - Normal: Patient uses correct words with no slurring
  - Abnormal: Slurred or inappropriate words or mute (1 point)

EMT

AEMT

❑ Advanced airway, vascular access and fluid therapy

PARAMEDIC

TEMPERATURE & ENVIRONMENTAL EMERGENCY

ALL PROVIDERS

❑ Scene and patient management
- Remove patient from hot or cold environment, when possible
- Focused history and physical exam
- Body temperature and blood glucose assessment.
- Assess level of consciousness; apply the ***ALTERED MENTAL STATUS*** guideline if applicable.
- Assess for underlying causes; medications, toxins, CNS lesions or other medical conditions.

❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry monitoring when available

TREATMENT PLAN

- **Heat Related**
  - Temperature elevation **WITHOUT** altered mental status (**Heat Exhaustion**)
    - Slow cooling with ice packs, wet towels, and/or fans to areas in the vicinity of carotid, femoral, brachial arteries.
    - If patient is alert and not nauseated → oral rehydration with water or balanced electrolyte solution.
    - Severe muscle cramps may be relieved by gentle stretching of the muscles.
  - Temperature elevation **WITH** altered mental status (**Heat Stroke**)
    - Aggressive cooling to unclothed patient utilizing fine mist water spray and fans in conjunction with ice packs to groin and axilla while maintaining modesty
    - Monitor closely for dysrhythmia, recognize and treat with the appropriate ***Cardiac Patient Care Guideline***
  - Room temperature IV fluids should be administered for both heat exhaustion and heat stroke (AEMT and PM only)
  - Benzodiazepines may be used for shivering (AEMT and PM only)
- **Cold Related**
  - Protect patient from further heat loss (application of blankets, removal of wet clothing, warm environment, etc.).
  - Suspicion of cardiac arrest in cold environment, assess for 30-45 seconds to confirm pulselessness.
  - Measure body temperature and treat accordingly
    - **Severe: <86°F (30°C)**
      - Use active external rewarming (heated oxygen, warm packs to neck, armpits, groin, etc.)
      - Administer warm IV fluids (AEMT/PM only)
      - Cardiac arrest:
        - ➢ Chest compressions and ventilations
        - ➢ Limit defibrillation attempts to 3 and no external pacing
        - ➢ Likelihood of successful defibrillation improves as the patient is warmed
      - Pediatric cardiac arrest due to hypothermia (temperature <86°F (30°C) → consider direct transport to SLC Primary Children's Medical Center for ECMO and **do NOT rewarm** this patient.
      - Adult cardiac arrest due to hypothermia (temperature <86°F (30°C) → consider direct transport to University of Utah Medical Center or Intermountain Medical Center for ECMO and **do NOT rewarm** this patient.
      - Handle the patient gently during transport because rough movement may precipitate dysrhythmias.
    - **Moderate: 86-93°F (30-34°C)**
      - Use warm packs to neck, armpits, and groin
      - Warm IV fluids (AEMT/PM only)
    - **Mild: >93°F (34°C)**
      - Warm with blankets, warm environment, etc.
      - Frostbite precautions – Do not rub or use dry external heat. Re-warm with 40°C water if possible.
      - Warm IV fluids (AEMT/PM only)

KEY POINTS/CONSIDERATIONS

❑ Avoid refreezing of cold extremities. If refreezing cannot definitively be avoided during transport → do ***NOT*** start the thawing process.

ADULT	PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring	
EMT	
AEMT	**AEMT**
HEAT EMERGENCIES ❑ Cool fluid therapy: 500 – 1000 cc NS bolus ❑ The order in which medications are listed below is not intended to indicate hierarchy, order, or preference of administration. ❑ Benzodiazepines for shivering: ● **Diazepam** ○ **IV/IO** 5 mg, may repeat every 5 minutes, if needed. Total max dose: 20mg ○ **IM** 10 mg, may repeat once in 10 minutes, if needed. Total max dose: 20 mg (IM not preferred unless no other options) ● **Lorazepam** ○ **IV/IO/IM** 1-2mg, may repeat every 5 minutes, if needed. Total max dose: 4mg ● **Midazolam** ○ **IN/IM/IV/IO** 5 mg, may repeat once in 5 minutes, if needed. Total max dose: 10mg	**HEAT EMERGENCIES** ❑ Advanced airway, vascular access and fluid therapy ❑ Cool fluid therapy: 20 ml/kg IV bolus ❑ The order in which medications are listed below is not intended to indicate hierarchy, order, or preference of administration. ❑ Benzodiazepines for shivering: ● **Diazepam** ○ **IV/IO** 0.1 mg/kg (max 5 mg), may repeat every 5 minutes, if needed. Total max dose: 10 mg ○ **IM** 0.2 mg/kg (max 10 mg), may repeat every 10 minutes, if needed. Total max dose: 20 mg (IM not preferred unless no other options) ● **Lorazepam** ○ **IV/IO** 0.1mg/kg (max 2 mg), may repeat every 5 minutes, if needed. Total max dose: 4 mg. ● **Midazolam** ○ **IN/IM** 0.2 mg/kg (max 5 mg), may repeat once in 5 minutes, if needed. Total max dose: 10 mg ○ **IV/IO** 0.1 mg/kg (max 5 mg), may repeat once in 5 minutes, if needed. Total max dose: 10 mg
COLD EMERGENCIES ❑ Warm fluid therapy: 500 – 1000 cc NS bolus	**COLD EMERGENCIES** ❑ Warm fluid therapy: 20 cc/kg NS bolus (Max 1 L)
PARAMEDIC	
COLD EMERGENCIES ❑ **Withhold anti-arrhythmic meds until temperature >86°F (30°C).**	

TOXIC EXPOSURE - CARBON MONOXIDE

ALL PROVIDERS

- ❑ Scene and patient management
  - Safely and rapidly remove patient from source of exposure.
  - Collect environmental CO levels if equipment is available.
- ❑ Focused history and physical exam
  - Estimation of exposure time.
  - Pulse oximetry readings are unreliable in carbon monoxide exposures
- ❑ Cardiac monitoring and $ETCO_2$, when available

TREATMENT PLAN

- Administer 100% high-flow oxygen via non-rebreather mask.
- Any exposure to carbon monoxide related to a closed space fire (such as a house fire) often also results in cyanide exposure.

KEY POINTS/CONSIDERATIONS

- ❑ Patients with symptoms of headache, nausea, tachycardia, neurologic changes, or a CO monitor reading >10% should be transported.

ADULT

EMR

- ❑ Blood glucose
- ❑ Pulse oximetry monitoring

EMT

AEMT

- ❑ Advanced airway management, vascular access and fluid therapy
- ❑ **Closed Space Fires**
  - Pt with GCS <10 or SBP <90 with soot mouth, nose, or airway
  - **Hydroxocobalamin** 5g (contained in a single vial), administered by IV/IO infusion over 15 minutes (approximately 15 mL/min)
- ❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

EMT

AEMT

- ❑ Advanced airway management, vascular access and fluid therapy
- ❑ **Closed Space Fires**
  - Pt with GCS <10 or SBP <normal for age with soot mouth, nose, or airway
  - **Hydroxocobalamin** 70 mg/kg over 15 minutes IV/IO (approximately 15 ml/min) not to exceed a max dose of 5 grams under direction of OLMC or Poison Control
- ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.**
  - Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

TOXIC EXPOSURE - CYANIDE

ALL PROVIDERS

❑ Scene Management
- If properly trained and equipped → safely and rapidly remove patient from the source of exposure.
- Request HazMat response as appropriate.
- Industries in which to consider cyanide exposure:
  - Electroplating and Metallurgy
  - Organic chemicals production
  - Photographic developing
  - Manufacture of plastics
  - Fumigation of ships
  - Some mining processes especially gold/copper
- Patients and EMS providers may be exposed to cyanide in the following ways;
  - Breathing air, drinking water, touching soil, or eating foods that contain cyanide.
  - Breathing smoke during closed-space fires.
  - Breathing air near a hazardous waste site containing cyanide.
  - Eating foods naturally containing cyanide compounds, such as apricot seeds and bitter almonds. However, the portions eaten in the United States contain relatively low amounts of cyanide.

❑ Focused history and physical exam
- Be alert for exposure related signs and symptoms;
  - Acute dyspnea/tachypnea without cyanosis
  - Nausea/vomiting
  - Seizures
  - Hyper or hypotension
  - Total body erythema (redness)

TREATMENT PLAN

❑ Administer high flow oxygen immediately and continuously

❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry when available
- BE AWARE: Pulse oximetry readings may not be accurate because of cyanide interaction

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
	EMT	
AEMT		**AEMT**
❑ Advanced airway, vascular access and fluid therapy ❑ **Hydroxocobalamin** for adults is 5 g (contained in a single vial), administered by IV/IO infusion over 15 minutes (approximately 15 mL/min) ● Pt with GCS <10 or SBP <90 with soot mouth, nose, or airway ❑ **Epinephrine (Push Dose)** 10 - 20mcg as needed to maintain a SBP >100 mmHg after fluid bolus		❑ Advanced airway, vascular access and fluid therapy ✆ **Hydroxycobalamin** can be used in children. Administer **70 mg/kg** over 15 minutes IV/IO (approximately 15 ml/min) not to exceed a max dose of 5 grams under direction of OLMC or Poison Control ● Pt with GCS <10 or SBP <normal for age with soot mouth, nose, or airway ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.** ● Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.

PARAMEDIC

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

TOXIC EXPOSURE - HYDROFLUORIC ACID

ALL PROVIDERS

❑ Scene Management
- Industrial Exposures in which to consider toxic exposure to hydrofluoric acid:
  - Aluminum processing
  - Chemical plants
  - Construction – waste products
  - Creation of chlorofluorohydrocarbons for refrigerants, aerosols, foams, plastics, and specialty solvents
  - Dry Cleaning Spotting Solutions
  - Electroplating
  - Foundry cast sand removal
  - Glass etching or cleaning
  - Meat packing industry
  - Petroleum refineries for high octane gasoline
  - Semiconductor silicon etching or cleaning
  - Stainless steel "pickling"
  - Stone etching or polishing
  - Uranium processing
  - Wheel cleaners

❑ Focused history and physical exam

❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available

TREATMENT PLAN

- **Skin Exposure**
  - Immediate irrigation. Clothing, jewelry etc., is removed as irrigation is taking place.
  - Soak burned skin in magnesium hydroxide antacid preparations (milk of magnesia, Mylanta, Maalox).
  - **Calcium Gluconate Gel** for application – Mix 25mL of 10% Calcium Gluconate in 75mL of a sterile water-soluble lubricant. Apply topically or if hand exposure → possibly in a glove
- **Eye Exposure**
  - Continuous rinsing with saline or water for a minimum of 15 minutes
- **Oral ingestion** – conscious/alert patient only – (OG Tube is recommended for the pediatric patient.)
  - If patient is able to swallow → administer any calcium or magnesium based antacid (milk of magnesia, Mylanta, Maalox). Consult OLMC for questions.
  - In the absence of an IV → consider giving calcium gluconate PO (1 gram) (AEMT and PM only)
  - **IV Calcium Gluconate & IV Magnesium:** for any ingestion (assume severe/fatal ingestion until proven otherwise)

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
	EMT	
	AEMT	
❑ Advanced airway, vascular access and fluid therapy ❑ **Calcium Gluconate Gel** for application – Mix 25mL of 10% Calcium Gluconate in 75mL of a sterile water-soluble lubricant. Apply topically or if hand exposure → possibly in a glove		

PARAMEDIC

- ❑ **Calcium Gluconate & Magnesium** IV
  - dermal exposures to high concentration (>20% HF) or large surface area of lower concentration (>5% TBSA)
  - Oral ingestion: In the absence of an IV, consider giving calcium gluconate PO (1 gram) in 10ml
- ❑ **Calcium Gluconate** IV 1000 mg IV (10 mL of a 10% solution) over 2 - 3 minutes.
- ❑ **Magnesium** IV 4 gm IV mixed in 50/100 ml of D5W/NS over 20 min

PARAMEDIC

✆ Contact OLMC or Poison Control for instructions

TOXIC EXPOSURE - ORGANOPHOSPHATES / NERVE AGENTS

ALL PROVIDERS

- ❑ Scene management
  - If properly trained and equipped → safely and rapidly remove patient from the source of exposure
  - Request HazMat response as appropriate
  - Be aware of exposure Level
    - Mild – miosis (constricted pupils) only or no symptoms
    - Moderate – Other signs or symptoms: Salivation, Lacrimation, Urination, Defecation, Gastrointestinal cramping, Emesis, and Miosis)
    - Severe – Unconscious, in respiratory distress, bradycardia, seizing, flaccid or apneic with any of the above
- ❑ Focused history and physical exam.
- ❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available

TREATMENT PLAN

- Irrigate immediately
- Remove clothing, jewelry etc. as irrigation is taking place

KEY POINTS/CONSIDERATIONS

- ❑ Always protect yourself from exposure before entering a treatment zone.
- ❑ These agents may be used in fertilizers or as pesticides, herbicides, fungicides, fire retardants, or biowarfare agents.
- ❑ CHEMPACK's are strategically placed across the state that provide antidotes for individuals exposed to a nerve agent or organophosphate release
- ❑ CHEMPACK's assets can be requested through your local dispatch

ADULT	PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring	
EMT	**EMT**
❑ **Atropine/Pralidoxime kits** (Mark I, Duodote, etc.) ● Mild Exposure with no symptoms may require no treatment ● Moderate Exposure with evidence of SLUDGEM give 1 - 2 Kits ● Severe Exposure with respiratory distress and SLUDGEM give 3 Kits	✆ Contact OLMC or Poison Control for instructions
AEMT	
PARAMEDIC	**PARAMEDIC**
❑ **Atropine sulfate 2 mg** rapid IV (preferred) or IM repeated every 10 minutes until you have: ● Control of bronchorrhea (excessive watery sputum) ● Control of bronchoconstriction, (as reflected by level of oxygenation and ease of ventilation) ● Reversed dangerous bradyarrhythmias or AV-blocks ❑ **If seizing occurs → refer to *SEIZURE* guideline**	✆ Contact OLMC or Poison Control for instructions

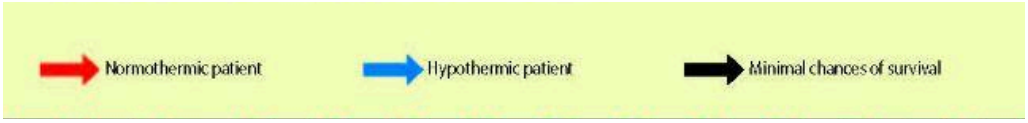
Avalanche Patient Care Guidelines

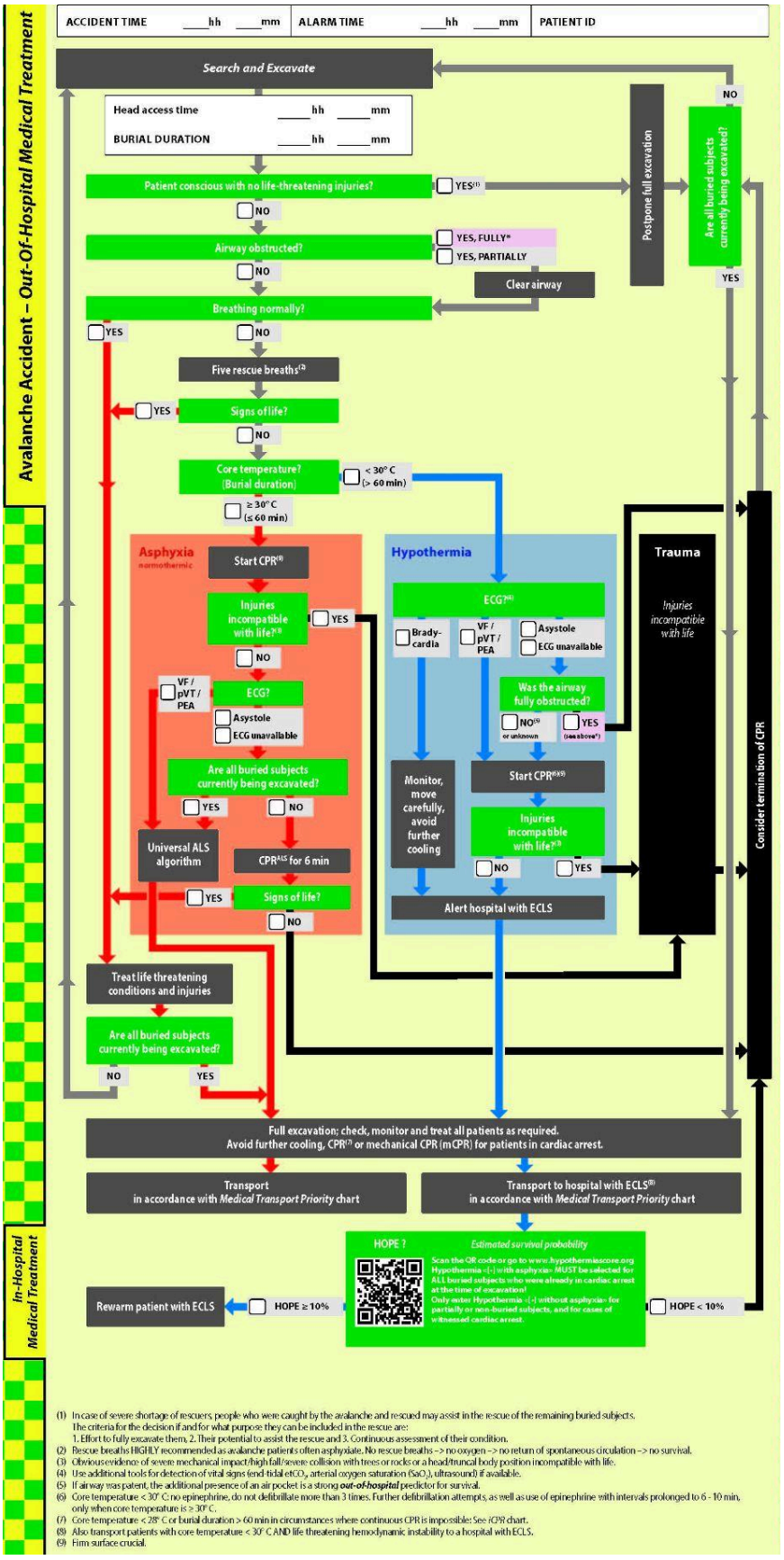
These guidelines were created to provide direction for each level of certified provider in caring for avalanche patients. The OLMC physician will always be the final word on treatment in the field. If there are ever any discrepancies between the guidelines and the OLMC physician these should be documented and brought to the attention of the physician at the receiving hospital. If the explanation is not sufficient, the provider should bring the issue to their medical director or the EMS for review.

General Approach to the Avalanche Patient Care Guidelines

- Use of standard trauma or medical triage algorithms can lead to the under-resuscitation and under-transportation of avalanche victims.
- Assess scene safety prior to entering scene or initiating care
  - Determination of scene safety in and near avalanche terrain may require consultation & coordination with Utah Department of Transportation, local Ski Patrol, Search & Rescue Groups, or other field operators.
- Destination decisions should be in accordance with the ***Utah Avalanche Triage Guideline Diagram*** (see below)
- Early notification allows the receiving physician to activate the receiving hospital's trauma alert and/or ECMO
- Providers should assess for and describe:
  - vital signs (including GCS/AVPU)
  - Injuries & any suspected complicating factors that will affect treatment (as per the ***Utah Avalanche Triage Guideline Diagram***) so that the hospital may activate the appropriate level of ECMO (also referenced as ECLS within the provided diagram) and/or trauma response.
- Consider air transport for patient who meet ECMO criteria or critically injured patients with long transport times to a trauma center (over 60 minutes).
- If your patient is unstable for a prolonged transport or the patient has a compromised airway that you cannot secure → consider delivery to the nearest hospital
- Any critically buried (head & chest below the snow) victim should be transferred to the nearest medical facility for evaluation, even if apparently uninjured.
- Consider that more than one guideline may apply.
- If conflicts arise between treatment guidelines → contact OLMC for clarification.

Utah Avalanche Triage Guideline Diagram




Avalanche Accident – Out-Of-Hospital Medical Treatment
ACCIDENT TIME ___hh ___mm
ALARM TIME ___hh ___mm
PATIENT ID
Search and Excavate
Head access time ___hh ___mm
BURIAL DURATION ___hh ___mm
Patient conscious with no life-threatening injuries?
YES(1)
NO
Postpone full excavation
Are all buried subjects currently being excavated?
NO
YES
Airway obstructed?
YES, FULLY*
YES, PARTIALLY
NO
Clear airway
Breathing normally?
YES
NO
Five rescue breaths(2)
YES
Signs of life?
NO
Core temperature? (Burial duration)
< 30° C (> 60 min)
≥ 30° C (≤ 60 min)
Asphyxia
normothermic
Start CPR(8)
Injuries incompatible with life?(3)
YES
NO
VF / pVT / PEA
ECG?
Asystole
ECG unavailable
Are all buried subjects currently being excavated?
YES
NO
Universal ALS algorithm
CPRALS for 6 min
YES
Signs of life?
NO
Hypothermia
ECG?(6)
Brady-cardia
VF / pVT / PEA
Asystole
ECG unavailable
Was the airway fully obstructed?
NO(5) or unknown
YES (see above*)
Monitor, move carefully, avoid further cooling
Start CPR(6)(9)
Injuries incompatible with life?(3)
NO
YES
Alert hospital with ECLS
Trauma
Injuries incompatible with life
Consider termination of CPR
Treat life threatening conditions and injuries
Are all buried subjects currently being excavated?
NO
YES
Full excavation; check, monitor and treat all patients as required.
Avoid further cooling, CPR(7) or mechanical CPR (mCPR) for patients in cardiac arrest.
Transport in accordance with Medical Transport Priority chart
Transport to hospital with ECLS(8) in accordance with Medical Transport Priority chart
In-Hospital Medical Treatment
HOPE ?
Estimated survival probability
Scan the QR code or go to www.hypothermiascore.org
Hypothermia «(-) with asphyxia» MUST be selected for ALL buried subjects who were already in cardiac arrest at the time of excavation!
Only enter Hypothermia «(-) without asphyxia» for partially or non-buried subjects, and for cases of witnessed cardiac arrest.
Rewarm patient with ECLS
HOPE ≥ 10%
HOPE < 10%
(1) In case of severe shortage of rescuers, people who were caught by the avalanche and rescued may assist in the rescue of the remaining buried subjects. The criteria for the decision if and for what purpose they can be included in the rescue are: 1. Effort to fully excavate them, 2. Their potential to assist the rescue and 3. Continuous assessment of their condition.
(2) Rescue breaths HIGHLY recommended as avalanche patients often asphyxiate. No rescue breaths –> no oxygen –> no return of spontaneous circulation –> no survival.
(3) Obvious evidence of severe mechanical impact/high fall/severe collision with trees or rocks or a head/truncal body position incompatible with life.
(4) Use additional tools for detection of vital signs (end-tidal $etCO_2$, arterial oxygen saturation (SaO_2), ultrasound) if available.
(5) If airway was patent, the additional presence of an air pocket is a strong out-of-hospital predictor for survival.
(6) Core temperature < 30° C: no epinephrine, do not defibrillate more than 3 times. Further defibrillation attempts, as well as use of epinephrine with intervals prolonged to 6 - 10 min, only when core temperature is ≥ 30° C.
(7) Core temperature < 28° C or burial duration > 60 min in circumstances where continuous CPR is impossible: See iCPR chart.
(8) Also transport patients with core temperature < 30° C AND life threatening hemodynamic instability to a hospital with ECLS.
(9) Firm surface crucial.

Hypothermia Staging

Hypothermia Staging *Core Temperature and Revised Swiss System*

Stage	Measured core temperature	Symptoms	Measures
1	35 - 32° C	**Alert**, clear answers[1]	Active rewarming by moving, warm sugary drinks
2	< 32 - 28° C	Impaired consciousness, responds to **verbal** stimulation[1]	Avoid further cooling, move carefully, warm sugary drinks
3	< 28° C	**Unconscious**, signs of life might be minimal[1]	Avoid further cooling, move carefully, monitor
4	Variable[2]	**No signs of life**	Apply AvaLife *Out-Of-Hospital Medical Treatment* algorithm

(1) Consciousness may be impaired by trauma or drugs.
(2) Hypothermic cardiac arrest in young, healthy persons occurs < 30° C, in older persons and persons with pre-existing diseases already < 32° C. Some persons still have vital signs < 24° C.

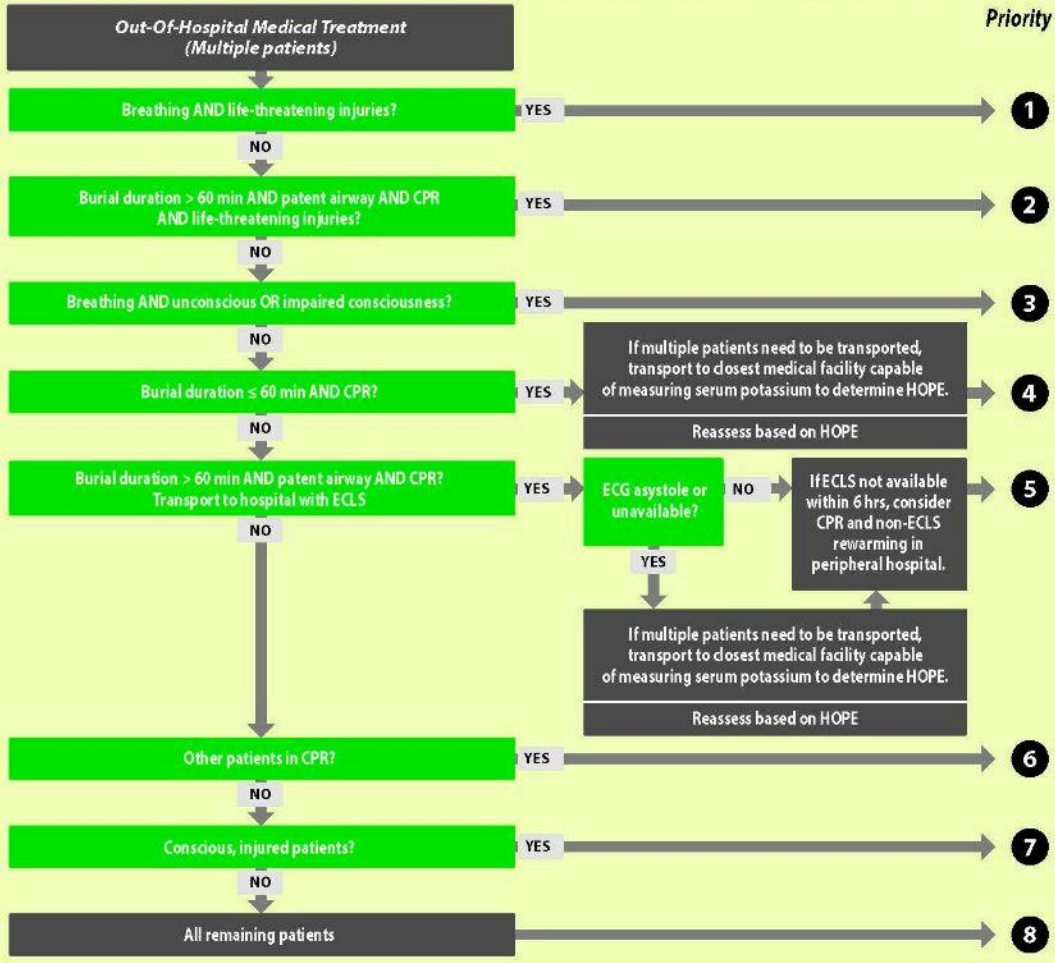
iCPR

Intermittent CPR: Mean of Last Resort!

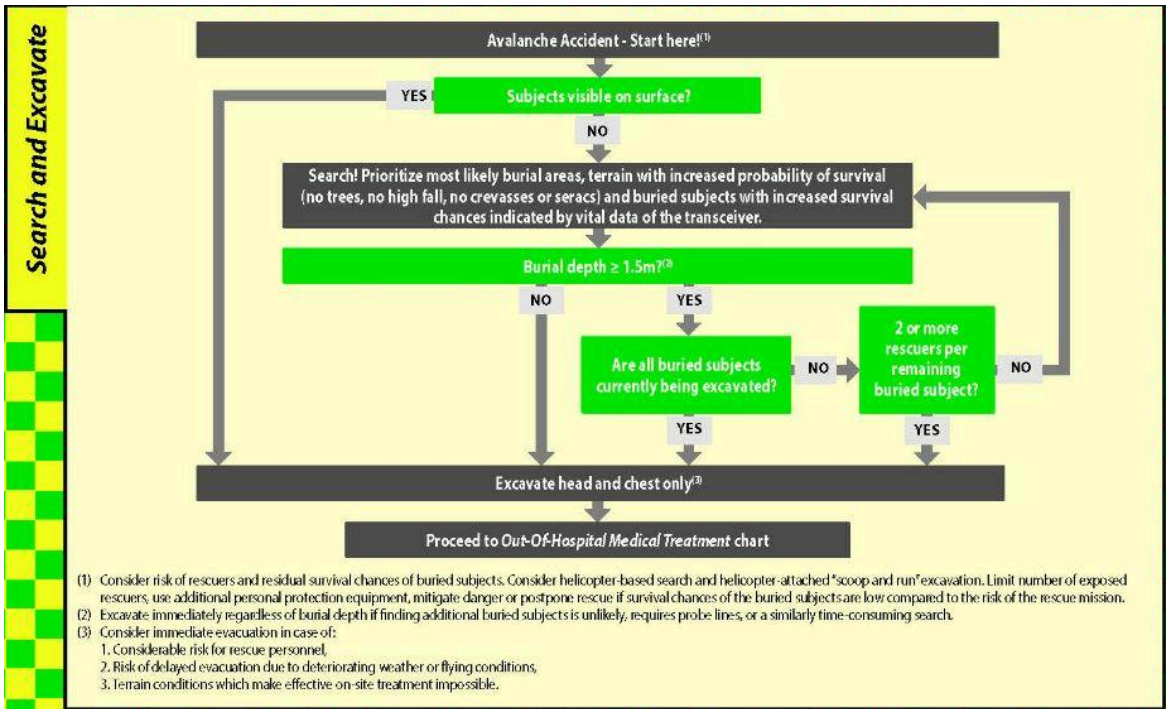
ONLY apply if transport is unavoidable and effective CPR impossible, or in cases where continuous CPR is impossible because of extremely limited resources.

Burial duration	Measures	Measured core temperature
≤ 60 min	No intermittent CPR, preferably apply mCPR	≥ 28° C
> 60 min: Before ICPR, ALWAYS perform uninterrupted CPR for ⅓ of the burial duration	At least 5 min of CPR followed by max 5 min without CPR	< 28° C
	At least 5min of CPR followed by max 10min without CPR	< 20° C

Avalanche Accident– Medical Transport Priority



(1) Transport priority is based on probability of survival and the urgency of treatment to preserve the chances of survival.
Priorities may change based on means of transport and their availability, transport times to appropriate medical facilities, weather conditions and out-of-hospital treatment options.



Reference:
Survival Chance Optimized Procedures in Rescue and How to Minimize Injuries During Excavation; Genswein M; ISSW2013; 1408-1417. | A concept for optimizing avalanche rescue strategies using a Monte Carlo simulation approach; Reiweger I, Genswein M, Paal P, Schweizer J (2017);
PLoS ONE 12(5): e0175877. https://doi.org/10.1371/journal.pone.0175877 | Hypothermia outcome prediction after extracorporeal life support for hypothermic cardiac arrest patients: The HOPE score; Pasquier M, Hugli O, Paal P, Darocha T, Blancher M, Husby P, Silfvast T, Carron P N,
Rousson V (2018); Resuscitation. 2018 May;126:58-64. doi: 10.1016/j.resuscitation. 2018.02.026. Epub2018 Mar 2. | Hypothermia outcome prediction after extracorporeal life support for hypothermic cardiac arrest patients: An external validation of the HOPE score; Pasquier M, Rousson V,
Darocha T, Bouzat P, Kosinski S, Sawamoto K, Champigneulle B, Wiberg S, Wanscher MCJ, Brodmann Maeder M, Paal P, Hugli O (2019); Resuscitation. 2019 Mar 30. pii: S0300-9572(19)30086-3. doi: 10.1016/j.resuscitation.2019.03.017. | Guidelines for Cardiac arrest in special circumstances
2020; Lott C, Truhlař A, Alfonzo A, Barelli A, Gonzales-Salvado V, Hinkelbein J, Nolan J P, Paal P, Perkins G D, Thies K-C, Yeung J, Zideman D A, Soar J (2020); European Resuscitation Council 2020.

AVALANCHE VICTIM MANAGEMENT

ALL PROVIDERS

❑ Scene and patient management
- Assess scene safety including specific risk of further avalanche activity before accessing patient
- Calculate Burial Time
- Initiate care as soon as head and upper body are exposed

❑ Continuous cardiac monitoring; $ETCO_2$, and pulse oximetry, when available

TREATMENT PLAN

- Assess airway patency, clear airway if applicable, and consider need for airway adjuncts if applicable and not contraindicated.
- If whole body frozen, decapitation, or hemicorporectomy have occurred → assess for evidence that resuscitation should not be attempted per the ***DEATH DETERMINATION & TERMINATION OF RESUSCITATION*** guideline.
  - **Note: that contrary to *GENERAL TRAUMA MANAGEMENT* guideline, care SHOULD still be initiated in apneic, pulseless patients.**
- Assess for presence of pulse, respirations, and consciousness. If absent, *AND* if no indications for withholding resuscitation are present (see ***Utah Avalanche Triage Guideline Diagram***) → initiate CPR and ACLS per ***CARDIAC ARREST*** guideline.
- Focused history and physical exam
- Assess risk of cervical spine injury
  - **Note:** that most avalanches are a high-risk mechanism. Refer to the ***SPINAL MOTION RESTRICTION*** guideline.
- Obtain core temperature as soon as possible

KEY POINTS/CONSIDERATIONS

❑ Scene times should be as short as possible for ECMO candidate patients and any severely injured trauma patient (Goal: 10 minutes). Perform required procedures en-route to the ECLS or trauma center

❑ Patients in cardiac arrest with core temperature <86°F (30°C), burial time >60 minutes, AND patent airway at extraction should be transported to an ECMO facility, as per the ***Utah Avalanche Triage Guideline Diagram.***

❑ Otherwise, severely injured trauma patients should be preferentially transported to a trauma center, as per the ***NATIONAL GUIDELINE FOR THE FIELD TRIAGE OF INJURED PATIENTS***

❑ Treat hypothermia per the ***TEMPERATURE & ENVIRONMENTAL EMERGENCY*** guideline

❑ Consider prolonged CPR (>30 minutes) until the patient is rewarmed to a core temperature ≥30°C

❑ CPR and ALS may be indicated beyond 60 min in the severely hypothermic patient (<28°C) and if arrest is suspected to be due to hypothermic rather than respiratory or traumatic arrest (patent airway, burial >60min, no signs of major trauma)

❑ If a technically difficult rescue, prolonged transport, or dynamic scene safety profile prevents continuous CPR, and the patient is suspected to be severely hypothermic (<28°C) → intermittent CPR may be indicated (alternating 5min on, ≤5 min off)

❑ Do not use EtC02 in decision to terminate resuscitation or predict outcomes

❑ **If risk to the rescue team is unacceptably high → withhold or terminate CPR**

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
	EMT	
	AEMT	
❑ Advanced airway, vascular access and fluid therapy ✆ **Contact OLMC before terminating resuscitative efforts in the field**		
	PARAMEDIC	
❑ May consider endotracheal intubation		

Trauma Patient Care Guidelines

These guidelines were created to provide direction for each level of certified provider in caring for trauma patients. All of these directions, dosages, and provisions are subject to change with later notice or revision of the guidelines. The OLMC physician will always be the final word on treatment in the field. If there are ever any discrepancies between the guidelines and the OLMC physician these should be documented and brought to the attention of the physician at the receiving hospital. If the explanation is not sufficient, the provider should bring the issue to their medical director or the BEMS for review.

General Approach to Trauma Patient Care Guidelines

- Assess your patient prior to initiating a guideline.
- Destination decisions for trauma patients should be in accordance with the ***NATIONAL GUIDELINE FOR THE FIELD TRIAGE OF INJURED PATIENTS*** (see below).
- Early notification allows the receiving physician to activate the receiving hospital's trauma alert system.
- Providers should describe: approximate age and sex, vital signs, including GCS/AVPU, injuries, mechanism of injury and any complicating factors that will affect treatment (as per the ***NATIONAL GUIDELINE FOR THE FIELD TRIAGE OF INJURED PATIENTS***) so that the hospital may activate the appropriate level of trauma response.
- Consider air transport for critically injured patients with long transport times (>60 minutes) to a trauma center.
- If your patient is *too* unstable for a prolonged transport or the patient has a compromised airway that you cannot secure → consider delivery to the nearest hospital
- More than one guideline may apply.
- If conflicts arise between treatment guidelines → contact OLMC for clarification.
- Providers may provide treatment up to the level of their certification only.
- Air Medical Transport Service personnel function under their own clinical guidelines.
- Contact your receiving hospitals and OLMC as soon as clinically possible for each patient.
- OLMC with a physician may change your treatment plan.
- Any variations to a guideline by the OLMC physician should be clarified to ensure that the provider has properly characterized the situation.
- The OLMC Physician has the final word on treatment once contact is made.
- The OLMC Physician must approve usage of dosages in excess of the guidelines.

General Pediatric Considerations

- Pediatric reference tape-based or age-based dosing is preferred over calculated doses for infants and children.
- Pediatric lowest acceptable systolic blood pressures are: birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg. These are the blood pressures to use for Pediatrics (<15 years old) under step one of the Utah Trauma Field Triage Guidelines.

National Guideline for the Field Triage of Injured Patients

RED CRITERIA

High Risk for Serious Injury

Injury Patterns	Mental Status & Vital Signs
• Penetrating injuries to head, neck, torso, and proximal extremities • Skull deformity, suspected skull fracture • Suspected spinal injury with new motor or sensory loss • Chest wall instability, deformity, or suspected flail chest • Suspected pelvic fracture • Suspected fracture of two or more proximal long bones • Crushed, degloved, mangled, or pulseless extremity • Amputation proximal to wrist or ankle • Active bleeding requiring a tourniquet or wound packing with continuous pressure	**All Patients** • Unable to follow commands (motor GCS < 6) • RR < 10 or > 29 breaths/min • Respiratory distress or need for respiratory support • Room-air pulse oximetry < 90% **Age 0–9 years** • SBP < 70mm Hg + (2 x age years) **Age 10–64 years** • SBP < 90 mmHg or • HR > SBP **Age ≥ 65 years** • SBP < 110 mmHg or • HR > SBP

Patients meeting any one of the above RED criteria should be transported to the highest-level trauma center available within the geographic constraints of the regional trauma system

YELLOW CRITERIA

Moderate Risk for Serious Injury

Mechanism of Injury	EMS Judgment
• High-Risk Auto Crash – Partial or complete ejection – Significant intrusion (including roof) • >12 inches occupant site OR • >18 inches any site OR • Need for extrication for entrapped patient – Death in passenger compartment – Child (Age 0–9) unrestrained or in unsecured child safety seat – Vehicle telemetry data consistent with severe injury • Rider separated from transport vehicle with significant impact (eg, motorcycle, ATV, horse, etc.) • Pedestrian/bicycle rider thrown, run over, or with significant impact • Fall from height > 10 feet (all ages)	**Consider risk factors, including:** • Low-level falls in young children (age ≤ 5 years) or older adults (age ≥ 65 years) with significant head impact • Anticoagulant use • Suspicion of child abuse • Special, high-resource healthcare needs • Pregnancy > 20 weeks • Burns in conjunction with trauma • Children should be triaged preferentially to pediatric capable centers **If concerned, take to a trauma center**

Patients meeting any one of the YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center, as available within the geographic constraints of the regional trauma system (need not be the highest-level trauma center)

Guidelines for Transport of Trauma Patients to Freestanding Emergency Departments (FSED)

Trauma patients at the FSED who need to be admitted will be moved to a trauma center as soon as possible.

The following specific types of patients are NOT candidates for transport to a freestanding ED (FSED):

1. Critically-injured patients with unstable vital signs or other life-threatening conditions UNLESS the patient's airway is not maintainable with EMS basic or advanced airway management techniques and the FSED is the closest ED
2. Traumatic arrest patients
3. Patients meeting Red or Yellow criteria of the Trauma Field Triage Guidelines.
4. Patients with head injuries who are taking anticoagulants
5. Patients with angulated femur and humerus fractures
6. Patients with suspected open fractures
7. EMS provider judgment

These guidelines may be modified during a disaster situation.

GENERAL TRAUMA MANAGEMENT

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Continuous cardiac monitoring; $ETCO_2$, and pulse oximetry, when available
- ❑ Scene times should be as short as possible for severely injured patients (Goal = <10 minutes). Perform required procedures enroute to the nearest trauma center.

TREATMENT PLAN

- ❑ **Primary Survey:**
  - *Hemorrhage Control:* (immediately assess for and stop severe hemorrhage)
    - Apply direct pressure. Place tourniquet 2-3" above wound or amputation directly on skin if possible. Ensure no distal pulse is felt and bleeding stops.
    - Pack all junctions or areas not amendable by tourniquet with hemostatic gauze. If hemostatic gauze is not accessible, utilize roll gauze.
  - *Airway:*
    - Place conscious patients in position of comfort
    - Assess airway patency, ask patient to talk to assess stridor and ease of air movement
    - Evaluate 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
    - Evaluate mental status for ability to protect airway. AVPU = "P" or "U" or GCS <8 patients will require airway protection.
    - Establish a patent airway (with cervical spine precautions)
  - *Breathing:*
    - Assess respiratory rate and pattern, symmetry of chest wall movement, and presence of breath sounds bilaterally
    - If chest injury present in a hypotensive patient, consider tension pneumothorax:
      - Needle Thoracostomy: **AEMT/Paramedic Only**
      - Needle Thoracostomy: The 4th intercostal space at the anterior axillary line is the preferred location for needle thoracostomy placement
      - 14 gauge catheter or larger is recommended
    - For an open chest wound, place a vented chest seal over the wound. If vented chest seal is unavailable → use full occlusive dressing and closely monitor for tension pneumothorax
    - Needle decompression and/or 'burping' may be required
  - *Circulation:*
    - Assess vital signs / check for radial pulse
    - If amputation is incomplete → cover stump with sterile dressing saturated in NS, splint affected digit or limb in baseline physiologic position.
    - All easily retrievable tissue should be transported. Do not delay transport for appendages.
    - Rinse part(s) with NS. Wrap tissue in sterile gauze moistened with NS. Place tissue into a plastic bag or container and place the bag/container into a separate container filled with ice (if available).
    - Do not allow tissue to come into direct contact with ice, do not freeze, and do not submerge in water.
    - If pelvis is unstable (based on lateral compression) → place pelvic binder to stabilize pelvis
    - If patient develops shock after an injury mechanism adequate to cause pelvic fracture → consider pelvic binder application (even in the absence of obvious pelvic instability on exam)
    - Reassess all tourniquets that may have been placed
  - *Disability* (quick neurologic evaluation)
    - Assess pupils, motor movement of extremities, and mental status (AVPU)
  - *Exposure/Environment:*
    - Rapid evaluation of entire body (including back) to assess for injuries while on scene
    - Enroute to hospital, completely expose the patient down to skin assessing for further injuries that may be hidden by clothing. Ensure patient is covered with blankets to prevent hypothermia.
    - Prevent hypothermia by removing wet clothing, providing passive rewarming, and use of warmed IV blood (if available) and/or fluids (if indicated)
  - Treat for pain per the ***PAIN MANAGEMENT*** guideline.

KEY POINTS/CONSIDERATIONS

- ❑ If a patient develops hemorrhagic shock → resuscitate with blood product (when available) see ***BLOOD PRODUCT TRANSFUSION*** guidelines.
  - ● If blood is unavailable → utilize permissive hypotension (for adults) normotension (for pediatrics); see ***SHOCK, SEPSIS, & FLUID THERAPY***.
- ❑ Commercial tourniquets are strongly preferred over improvised tourniquets
  - ● All improvised tourniquets should be replaced with commercial tourniquets when available/needed.
- ❑ Tourniquets are painful and the conscious patient will likely require high-dose or multimodal pain management.
- ❑ **Tourniquet conversion:** When a tourniquet is initially placed to stop obvious severe hemorrhage, an attempt may be made to replace it with a pressure dressing after the patient is stabilized and bleeding is controlled.
  - ● Consider leaving the TQ loosely in place in case severe hemorrhage begins again
  - ● Notify providers at transfer of patient care of TQ conversion and/or application time
    - ○ Tourniquets should NOT be removed/replaced if:
      - ■ Amputation *OR* near-amputation
      - ■ Unstable *OR* complex multiple-trauma patients
      - ■ Unstable clinical or tactical situations
  - ● Severely injured trauma patients should be preferentially transported to a state-certified trauma center, as per the ***NATIONAL GUIDELINE FOR THE FIELD TRIAGE OF INJURED PATIENTS.***
- ❑ **Withholding and/or Termination of Resuscitative Efforts**
  - ○ Resuscitative efforts should be withheld for trauma patients with any of the following:
    - ■ Decapitation
    - ■ Hemicorporectomy (transection of trunk)
    - ■ Signs of rigor mortis or dependent lividity
    - ■ Blunt trauma patients who are apneic, pulseless, and have no organized activity on cardiac monitor
  - ○ **Blunt and penetrating trauma (with signs of life):** Goal is a scene time of <10 minutes and rapid transport to the nearest trauma facility. Continue all resuscitative efforts throughout transport.
  - ○ **Blunt traumatic arrest:** Upon arrival on scene in patients with blunt traumatic arrest, a slightly longer scene time of 15 minutes may be required for resuscitative efforts.
    - ✆ If no return of spontaneous circulation is achieved → contact OLMC for approval prior to terminating resuscitation.
  - ○ **Penetrating traumatic arrest >15 minutes from time of arrest:** Can consider termination, highly recommended to contact medical control.
  - ○ Also see ***DEATH DETERMINATION & TERMINATION OF RESUSCITATION*** guideline
- ❑ Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2), and over 10 years = 90mmHg.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Blood pressure and pulse oximetry monitoring		
	EMT	
❑ Continuous cardiac monitoring and $ETCO_2$		
	AEMT	
❑ Advanced airway, vascular access, and fluid therapy as appropriate		

PARAMEDIC

SUSPECTED HEMORRHAGIC SHOCK

(evidence of internal **or** external hemorrhage + signs of shock)

- ❑ Consider shock in patients with one or more of the following:
  - Pale/cool/clammy skin signs
  - Delayed capillary refill
  - Altered, lethargic or irritable
  - Adult vital signs:
    - HR >110
    - RR >24
    - SBP <90 or MAP <65
    - $ETCO_2$ <25 mmHg
    - Shock Index >1
      - Shock Index = HR ÷ SBP
  - Pediatric vital signs:
    - Tachycardia, tachypnea or hypotension relative to age-based or broselow tape vital signs ranges
- ❑ Administer blood product (if available) as per ***BLOOD PRODUCT TRANSFUSION*** guideline
- ❑ When blood product unavailable, consider permissive hypotension (adults) / normotension (pediatrics) and IV crystalloid as per ***SHOCK, SEPSIS, & FLUID THERAPY*** guideline*;* also consider handoff or rendezvous with blood-equipped unit
- ❑ **Tranexamic Acid (TXA**): If injury occurred ***MORE THAN*** three hours prior → do ***NOT*** administer TXA
  - **Adults**: 2g in 100ml NS/LR via IV/IO infusion over ten minutes.
  - **Pediatrics**: 15mg/kg in 100ml NS/LR via IV/IO infusion over 10min (max 1000mg), followed by 2mg/kg per hour
- ❑ Consider pelvic binder application in patients with history or signs of pelvic trauma

SUSPECTED TENSION PNEUMOTHORAX:

(evidence of chest trauma + signs of shock)

- ❑ Immediate needle decompression of affected side

TRAUMATIC ARREST:

- ❑ Prioritize the completion of potentially life-saving interventions (LSI) over chest compressions while enroute to hospital.
  - Control any severe external hemorrhage via tourniquets, wound packing, direct pressure
  - Manage airway using least-invasive approach necessary to achieve patency and oxygenation
  - Consider bilateral needle thoracostomy in patients with signs of thoracic trauma
  - Consider pelvic binder application in patients with signs of pelvic trauma
- ❑ Consider IV/IO access and initiation of fluid bolus once LSI complete
- ❑ Epinephrine is unlikely to be effective. If administered → prioritize completion of LSI first

BURNS – THERMAL / ELECTRICAL / LIGHTNING

ALL PROVIDERS

❑ Scene and patient management
- Thermal Burns
  - Stop the burning process.
  - If material is stuck to the wound → cut clothing around it. Do not pull material
- Electrical Burns
  - Do not touch the patient until you are sure that the electrical source is disconnected.
  - When multiple patients are struck simultaneously by lightning or a high voltage source, those in respiratory and/or cardiac arrest should be given the highest priority of care, even those who appear dead on initial evaluation. These patients may be in ventricular fibrillation and resuscitated with CPR and defibrillation.

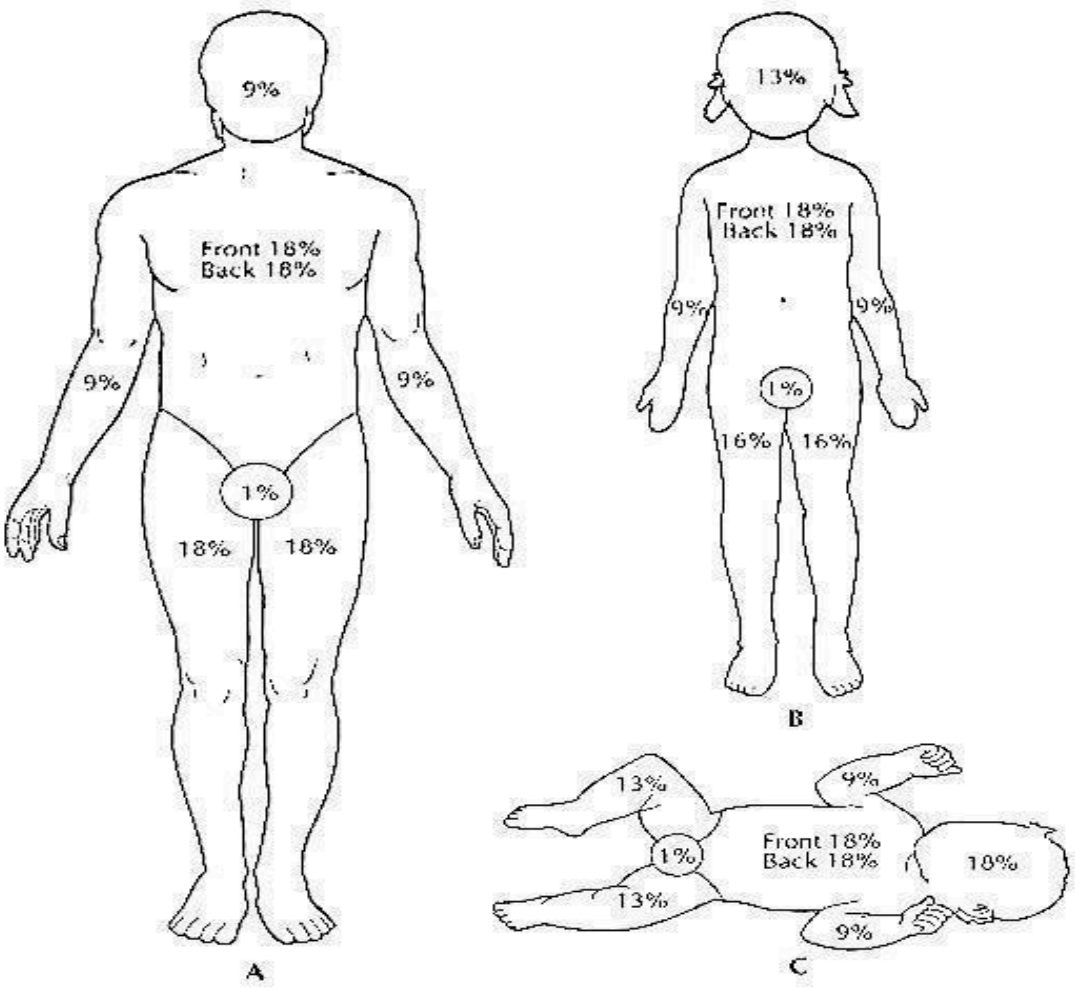
❑ Focused history and physical exam
- Identify all contact points. Carefully check hands, feet and scalp as hair may obstruct wounds.

❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available.
- Avoid placing monitor attachments over burned skin if possible

TREATMENT PLAN
- Initiate early oxygen therapy with high flow O_2.
- Be vigilant for other traumatic injuries in all patients who have sustained electrical injury
- If patient is in shock → fluid resuscitation as per ***SHOCK, SEPSIS, & FLUID THERAPY*** guideline (AEMT/Paramedic)
- With electrical burns anticipate heart rhythm irregularities.
- Assess for circulatory compromise from circumferential extremity burns or ventilator compromise from circumferential chest burns.
- Remove items that may constrict swelling tissue.
- Estimate size and depth of burn using the percentage chart (below).
- Dressings: Cover burns with dry dressings.
- Closely monitor patient's temperature and prevent hypothermia.
- Treat for pain per the ***PAIN MANAGEMENT*** guideline.
- Burn patients with major trauma should be transported to a trauma center as per the Trauma Field Triage Guideline
- Consider air ambulance transportation for long transport times, inability to control pain after maximal doses of analgesics, and airway concerns that might necessitate advanced airway management
- Consider transport directly to a designated burn center for the following:
  - Inhalation injuries
  - Partial or Full Thickness (2^{nd} or 3^{rd} degree) burns with TBSA >10%
  - Circumferential burns
  - Partial or full thickness burns involving face, hands, or genitalia
  - Electrical burns
  - Chemical burns

KEY POINTS/CONSIDERATIONS

- ❑ Electrical Burns and hydrofluoric acid exposure are frequently more serious than they appear.
- ❑ Consider 12-lead EKG for patients with electrical burns
- ❑ Care for traumatic injuries should precede care for the burn.
- ❑ If the patient is initially hypotensive after burn (first hour) *AND* it is NOT a result of the burn → strongly suspect underlying trauma.
- ❑ Keep patients warm! Patients are prone to hypothermia due to heat loss from the burns.
- ❑ The potential for non-accidental burn trauma (child abuse, neglect) must always be considered particularly in young and vulnerable children. Scald burn to hands, feet, buttocks, and genitalia are common burns seen with non-accidental trauma (especially in children <5 years old)
- ❑ Pattern of injury is not compatible with the history provided as another non accidental cue.
- ❑ Consider cyanide and carbon monoxide in close-spaces fires
- ❑ Do not over hydrate patients with IV fluid. See proper fluid rates for burns below.
- ❑ LR is preferred over NS but NS may be used when LR is unavailable
- ❑ Definitions:
  - Superficial (1st Degree) Burns – red, painful, without blisters.
  - Partial Thickness (2nd Degree) Burns – red, painful/hypersensitive, swollen, with either intact or ruptured blisters.
  - Full Thickness (3rd Degree) Burns – dark, leathery, painless, waxy, and does not blanch.
- ❑ **Calculation of Burn Surface Area (%BSA)**: ***based only on 2nd and 3rd degree burn total***



ADULT	PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring	
EMT	
❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure	
AEMT	**AEMT**
❑ Advanced airway, vascular access ● If possible, avoid placing IV through burned skin ❑ **IV Fluid therapy:** If 2nd + 3rd degree >10% BSA or if an electrical burn, begin: ● LR or NS at 500 cc/hr (no bolus)	❑ Advanced airway, vascular access ● If possible, avoid placing IV through burned skin ❑ **IV Fluid therapy:** If 2nd or 3rd degree >10% BSA or if an electrical burn, begin: ● LR or NS infusion rates (no bolus) ○ <5 years old: 125 cc/hr ○ 5-13 years old: 250 cc/hr ○ >13 years old: 500 cc/hr
PARAMEDIC	**PARAMEDIC**
❑ If evidence of possible airway burn (singed nasal hair, carbonaceous sputum, hoarse voice, or stridor) → consider early intubation ❑ If signs of cyanide toxicity present: ● **Hydroxycobalamin** 5 g IV over 15 min	❑ If evidence of possible airway burn (singed nasal hair, carbonaceous sputum, hoarse voice, or stridor) → consider early intubation ❑ If signs of cyanide toxicity present: ● **Hydroxycobalamin** 70 mg/kg IV over 15 min (max 5 gm)

ENT / DENTAL / FRACTURES / CRUSH INJURIES

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ If patient develops hemorrhagic shock → resuscitate preferentially with blood product (when available) instead of IV fluid; see ***SHOCK, SEPSIS, & FLUID THERAPY*** and ***BLOOD PRODUCT TRANSFUSION*** guidelines.

TREATMENT PLAN

- Maintain airway, administer oxygen to maintain SpO_2 90-94%.
- Assess for deformity, swelling, tenderness, crepitus, open or closed fractures, hemorrhaging, lacerations, ecchymosis, instability, decreased function or pulses, loss of sensation of distal extremities.
- **Epistaxis**
  - Bleeding from the nose should be controlled by first having the patient sit and lean forward (unless there is a need for spinal motion restriction).
  - Apply direct pressure by pinching the fleshy portion of the nostrils, with fingers or nose clamp.
  - May pack nostrils with hemostatic gauze if bleeding continues
- **Neck Wounds**
  - Pack lacerations or puncture wounds on the neck near the great vessels or trachea
  - Closely monitor for subcutaneous emphysema. Place occlusive dressing over packing if necessary.
- **Crush syndrome**
  - Entrapped/compressed patients or limbs under a load for more than 30 minutes
  - Patients with little or no movement for more than 4 hours (e.g. older patient falls, overdoses, etc.)
  - Patients with crush syndromes are prone to cardiac dysrhythmias and electrolyte abnormalities. They should be placed on a cardiac monitor and the rescuer should be ready for possible cardiac arrest. If this happens then consider treatment for hyperkalemia.
- **Abdominal eviscerations**
  - Cover with a moist sterile dressing.
  - Do not attempt to replace organs.
- **Extruded eye or deflated globe**
  - Cover with a moist sterile dressing and protective eye shield.
  - Do not apply pressure or attempt to replace in the socket.
  - If the patient will tolerate it → Cover both eyes, to minimize total eye movement
- **Skin avulsions**
  - If large and partially attached → the tissue should be returned to its original position and stabilized whenever possible.
  - Elevate the limb such that the wound is above the heart.
- **Impaled objects**
  - Stabilize in place and cover with dry sterile dressings.
    - Exceptions would be:
      - Objects through the cheek where there is the possibility of airway compromise.
      - Objects that would interfere with chest compressions.
- **Fractures/dislocations:**
  - Stabilize suspected fractures/dislocations
  - If extremity is deformed and distal vascular status is compromised (poor distal pulse or capillary refill) → gently attempt to restore normal anatomic position with gentle traction. Pain medication should be considered prior to any manipulation.
  - If extremity is deformed but vascular function is normal → splint in current position, to limit movement of suspected fracture.
  - If open fracture with exposed bone → place moist gauze over exposed bone
  - Elevate extremity above heart level, when possible, to minimize swelling.

- ❑ Treat for pain per the ***PAIN MANAGEMENT*** guideline.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
	EMT	
❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure		
AEMT		**AEMT**
❑ Advanced airway, vascular access and fluid therapy ❑ For crush injury patients, when possible, initiate IV/IO access and consider administration of 1 liter NS bolus prior to release from entrapment ❑ Consider hemostatic agents if available		❑ Advanced airway, vascular access and fluid therapy ❑ For crush injury patients, when possible, initiate IV/IO access and consider administration of NS 20 mg/kg bolus (Max 1L) prior to release from entrapment ❑ Consider hemostatic agents if available
PARAMEDIC		**PARAMEDIC**
<u>FOR PATIENTS WITH SEVERE HEMORRHAGE AND SIGNS OF SHOCK:</u> ❑ **Blood Product:** See ***BLOOD PRODUCT TRANSFUSION*** guideline ❑ **Tranexamic Acid (TXA)** 2g in 100ml NS/LR via IV/IO infusion over 10min		**<u>FOR PATIENTS WITH SEVERE HEMORRHAGE AND SIGNS OF SHOCK:</u>** ❑ **Tranexamic Acid (TXA)** 15mg/kg in 100ml NS/LR via IV/IO infusion over 10min (Max 1000mg), followed by 2mg/kg per hour

ENVENOMATION

ALL PROVIDERS

- ❑ Focused history and physical exam
  - ● Identify and document the type of animal; appearance, geographical location, any distinguishing marks.
    - ○ Coral Snakes in North America – "Red on/touches Yellow = Poison Fellow, Red on/touches Black = Safe with attack".
  - ● Obtain an accurate time of injury
  - ● Clarify any first aid provided by friends or family prior to arrival
  - ● Signs of envenomation include paresthesia, metallic taste, chills, nausea, vomiting, headache, dysphagia, cramps, hypotension, fever, local edema, blebs, and discoloration.
- ❑ Continuous cardiac monitoring; $ETCO_2$, and pulse oximetry, when available.

TREATMENT PLAN

- ● Ensure scene safety by moving the patient to a safe distance, away from the snake.
- ● Splint limb and place at the level of or below the heart.
- ● Keep patient calm and movement to a minimum. May require treating for pain per ***PAIN MANAGEMENT*** guideline.
- ● Remove items that may constrict swelling tissue, such as watches, rings or bracelets.

KEY POINTS/CONSIDERATIONS

- ❑ Do not start the IV in the affected limb.
- ❑ DO NOT apply tourniquet
- ❑ Do not apply ice to the limb.
- ❑ Do not try to capture the animal.
- ❑ Do not bring the animal to the ED.
  - ● Remember that snakes can reflexively envenomate up to 1 hour after death.
- ❑ Pictures of the animal can be helpful.
- ❑ Any snake bite can be dangerous and should be evaluated in the ED.
- ❑ Watch for signs of shock and allergic reaction.

ADULT		PEDIATRIC (<15 years of Age) NOTE: Pediatric weight based dosing should not exceed Adult dosing.
	EMR	
❑ Blood glucose ❑ Pulse oximetry monitoring		
	EMT	
❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure		
AEMT		**AEMT**
❑ Advanced airway, vascular access, and fluid therapy ❑ **Epinephrine (Push Dose)** 10–20mcg as needed to maintain a SBP >100 mmHg after fluid bolus		❑ Advanced airway, vascular access, and fluid therapy ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.** ● Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

PERSISTENT HYPOTENSION UNRESPONSIVE TO FLUIDS:

- ❑ **Epinephrine** 0.05–1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ❑ **Norepinephrine** 0.05–1 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP >100 mmHg.

PARAMEDIC

PERSISTENT HYPOTENSION UNRESPONSIVE TO FLUIDS:

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

HEAD INJURY (TRAUMATIC BRAIN INJURY)

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Cardiac monitoring; $ETCO_2$, and pulse oximetry, when available

TREATMENT PLAN

- Maintain airway. Administer oxygen to maintain SpO_2 ≥94%.
- Consider spinal motion restrictions
- Elevate head 30°.
- Monitor the level of consciousness during the transport
- **Severe TBI** (GCS <8 or AVPU "P" or "U"):
  - **Adult**: Consider endotracheal intubation for airway protection (Paramedic only)
  - **Pediatrics**: Continue effective BVM.
    - If needed to ensure adequate chest rise, ventilation, and oxygenation → utilize airway adjuncts
  - Target $ETCO_2$: maintain 35-45 mmHg
  - **Do not hyperventilate** unless patient shows signs of herniation: unilateral pupillary dilation or posturing. In this case, increase respiratory rate by ~10% above normal target respiratory rate (see Mild Hyperventilation Guide). Target $ETCO_2$: 30-35 mmHg.

MILD HYPERVENTILATION GUIDE FOR SIGNS OF HERNIATION

Age	Normal Ventilation Rate	Mild Hyperventilation Rate
Neonate	40	44
Infant	30	33
Child	20	22
Adult	10	12

- Open skull fractures should be covered with dry sterile dressings. Do not apply pressure unless need to stop severe hemorrhage.

KEY POINTS/CONSIDERATIONS

- ❑ TBI may be painful. However, excessive pain medications can cloud serial neurological assessments. Pain medications should generally be avoided in a patient with altered mental status after TBI. If pain is severe, give small doses only until pain is manageable.
- ❑ Patients with TBI may be confused or combative. If needed to protect patient or personnel → consider physical/chemical restraints.
- ❑ Loss of memory, prolonged confusion or altered mental status associated with trauma may indicate a significant head injury.
- ❑ Avoid over tightening of cervical collar (if placed) as this can cause increased intracranial pressure
- ❑ Do not allow the patient to be hypotensive. Try to keep adult SBP >110 using the ***SHOCK, SEPSIS, & FLUID THERAPY*** guideline.
- ❑ Keep pediatric patients MAP >60 mmHG using the ***SHOCK, SEPSIS, & FLUID THERAPY*** guideline.

ADULT

PEDIATRIC (<15 years of Age)
NOTE: Pediatric weight based dosing should not exceed Adult dosing.

EMR

- ❑ Blood glucose
- ❑ Pulse oximetry monitoring

EMT

- ❑ Continuous cardiac monitoring; $ETCO_2$, blood pressure

AEMT

- ❑ Advanced airway, vascular access, and fluid therapy
- ❑ Check blood pressure every 5-10 minutes.
- ❑ **Epinephrine (Push Dose)** 10-20mcg as needed to maintain a SBP >100 mmHg after fluid bolus

PARAMEDIC

PERSISTENT HYPOTENSION UNRESPONSIVE TO FLUIDS:

- ❑ **Epinephrine** 0.05–1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ❑ **Norepinephrine** 0.05–1 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP >100 mmHg.

AEMT

- ❑ Advanced airway, vascular access, and fluid therapy
- ❑ Check blood pressure every 5-10 minutes.
- ❑ Initiate NS 20 ml/kg IV/IO for hypotension OR if unable to obtain blood pressure (Max 1L)
- ❑ If hypotensive patient shows no improvement with initial treatment → may repeat NS 20 ml/kg (Max 1L) IV/IO up to a total of 40 ml/kg (Max 2L)
- ❑ **Epinephrine (Push Dose)** 1 mcg/kg may repeat as needed to maintain a SBP >70 (50 mcg max total) + (age in years x 2) mmHg **after fluid bolus.**
  - Birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

PARAMEDIC

PERSISTENT HYPOTENSION UNRESPONSIVE TO FLUIDS:

- ❑ **Epinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- ❑ **Norepinephrine** 0.05 - 1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

NON-ACCIDENTAL TRAUMA / ABUSE

ALL PROVIDERS

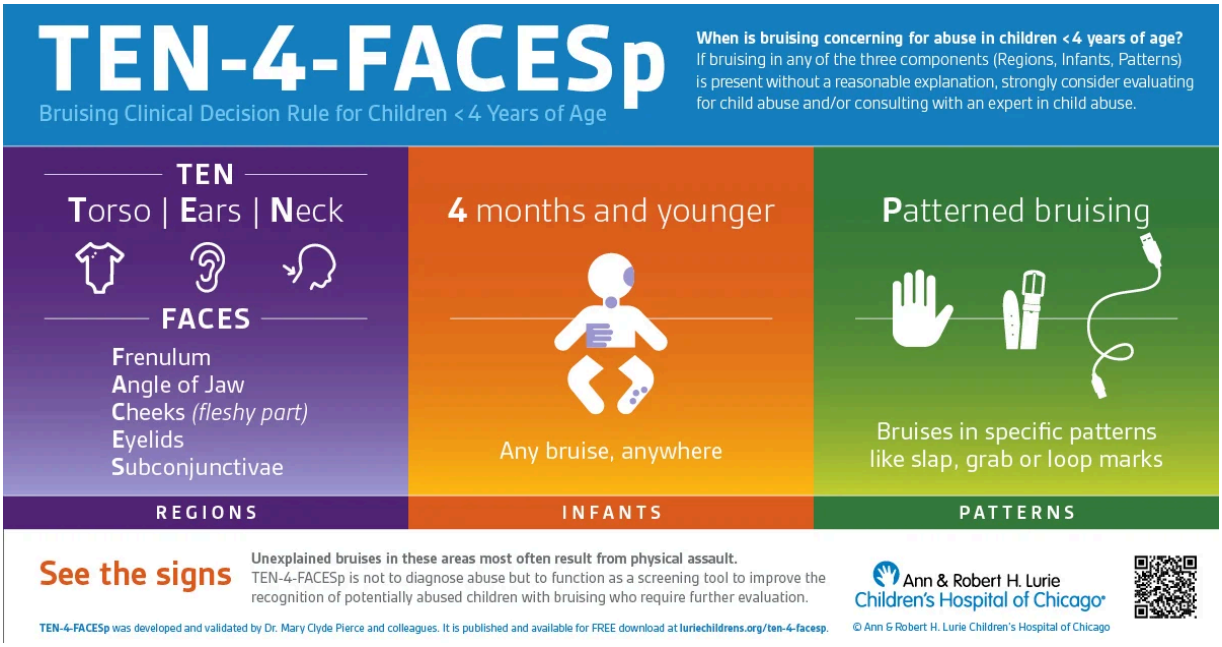
- ❑ Scene and patient management
  - If someone on scene is a threat to themselves or others → contact Law Enforcement
  - Separate any possible assailants, including parents, from the patient.
  - Remove patient from the stressful environment and remove any possible weapons.
  - Non-accidental trauma includes any act of commission or omission that results in harm to a person's physical, developmental, or emotional state.
- ❑ Focused history and physical exam
  - Blood glucose, temperature and oxygen saturation assessment.
  - Always consider the possibility of abuse when evaluating any medical condition or trauma.
- ❑ Continuous cardiac monitoring; $ETCO_2$, and pulse oximetry, when available.

TREATMENT PLAN

- Suspect: Look for suspicious circumstances or actions from patient or caregiver
  - Listen to and document circumstances of the event.
  - Evaluate the environment in which you find the patient.
- Protect: Be the patient advocate
  - Make all efforts to remove patient from the situation.
- Respect: Communicate appropriately with family
  - Avoid confrontation with caregivers.
  - Be nonjudgmental and avoid accusations.
  - Consider law enforcement assistance.
- Collect: Provide good documentation of incident.
  - Document using direct quotation when possible. Describe the scene rather than interpret it. Example: "garbage on floor, spoiled food on counter" is more helpful than "dirty apartment.
  - Document objectively without speculation.
  - HIPAA-compliant photography may be considered for documentation.
- Report: You have the responsibility to report suspected child or elder abuse and neglect **to law enforcement or the Division of Family Services.** 1-855-323-DCFS (3237)

KEY POINTS/CONSIDERATIONS

- ❑ Non-accidental trauma, abuse, or neglect can occur in patients of any age and in all ethnic and socio-economic groups.
- ❑ **TEN-4 Rule** (see below)
  - For children 4 and younger bruising to the Torso, around the Ears or the Neck needs to be reported. Additionally, any bruising in a baby not yet pulling up or taking steps is highly suspicious.
  - In children under the age of two the most common form of child abuse is **Abusive Head Injury (AHI)**. For those that live, there is significant morbidity, usually associated with traumatic brain injury.
- ❑ Risk factors include children under age of 5, the elderly, drug or alcohol abuse, and a history of domestic violence.
- ❑ Do not directly engage a hostile patient, parent, assailant or perpetrator. If a situation becomes unsafe for EMS personnel → call for police assistance.
- ❑ If anxious or agitated → prioritize usage of non-pharmacological options to calm a patient.
- ❑ Consider pain management per the ***PAIN MANAGEMENT*** guideline.



SPINAL MOTION RESTRICTIONS (SMR)

ALL PROVIDERS

❑ **Assess the scene** → To determine the risk of injury
- Mechanism alone should NOT determine if a patient requires SMR. However, mechanisms that have been associated with a higher risk of cervical spine injury:
  - Motor vehicle collisions, including automobiles, motorcycles, ATVs, and snowmobiles
  - Axial loading injuries to the spine, such as diving accidents
  - Severe injuries to the torso
  - Falls >10 feet

❑ **Assess the patient**
- In the position in which they *were found*
- Initial assessment should focus on determining whether or not a cervical collar needs to be applied.
- When assessing mental status check:
  - neurologic deficits
  - spinal pain or tenderness
  - any evidence of intoxication
  - other severe/painful injuries

TREATMENT PLAN (develop and implement plan based on assessment findings, resources, and training)
- Perform full SMR if there are any of the following:
  - Patient complains of midline neck or back pain
  - Any midline neck or spinal tenderness with palpation
  - Any anatomic deformity of the spine
  - Any abnormal mental status (including extreme agitation)
  - Any neurologic deficit
  - Any evidence of alcohol or drug intoxication
  - Another severe or painful distracting injury is present
  - Torticollis in children
  - A communication barrier that prevents accurate assessment
- If none of the above apply → a cervical collar DOES NOT need to be placed on the patient (unless the treating medic feels there is a high risk of cervical spine injury)
- Patients with a penetrating injury to the neck should **NOT** have a cervical collar placed, regardless of whether they are exhibiting neurologic symptoms. Doing so can lead to delayed identification of injury or airway compromise and has been associated with increased mortality in such patients.
- **Extrication:**
  - From a vehicle: After placing a cervical collar, if indicated as above, adults and children in a booster seat should be allowed to self-extricate, if they are able.
    - Infants and toddlers already strapped in a car seat with a built-in harness → remove the car seat and child together, leaving the child secured in the car seat.
  - Other situations requiring extrication: A padded long board may be used for extrications, using the lift and slide technique.
- **Helmet Removal:**
  - If a helmet needs to be removed → remove the face mask followed by manual removal of the helmet (rather than the use of automated devices), while keeping neck motion manually restricted.
  - Occipital padding should be applied, as needed, with the patient in a supine position, in order to maintain neutral cervical spine positioning.
- **Transportation:**
  - APPROPRIATE options for SMR:
    - Padded scoop stretchers
    - vacuum splints
    - secured ambulance cot
  - Patients should **NOT** routinely be transported on long boards
    - Appropriate long board use → facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities.
    - In the rare situation that specifically warrants long board use → long boards should be padded or have a vacuum mattress applied to minimize secondary injury to the patient.

- **Assess neurological function before, during, and after application of SMR.**

KEY POINTS/CONSIDERATIONS

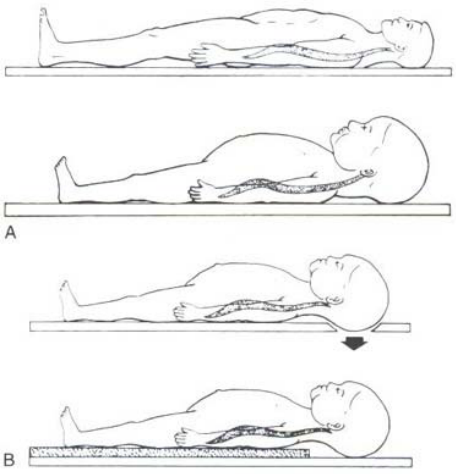
❑ **GENERAL KEY CONSIDERATIONS**

- Patients who have a low likelihood of spinal injury and are therefore not likely to benefit from SMR, should not be immobilized.
- Patients should be "log rolled," with maintenance of spinal alignment, for examination of the spine for tenderness and deformities.
- Ambulatory patients who are alert and cooperative may be safely immobilized on a gurney with cervical collar and straps and will generally not require a spine board.

❑ **PEDIATRIC POPULATION**

- Age <2 should be secured in a car seat or age appropriate papoose device.
- Children who are <5 years old should be secured with an appropriately-sized cervical collar or soft towel rolls and tape, if tolerated. If attempts at SMR result in more distress and fighting to get free, then SMR should be minimized.
- Children under the age of 8 cannot have their cervical spines reliably assessed in the field and should have the cervical spine immobilized if the mechanism warrants it.
- Children do not require full SMR if isolated injury to the cervical spine is suspected as their risk for noncontiguous spinal injuries is much lower than adults.
- Use a pediatric specific backboard for those <8 years old OR use a towel or pad to raise the child's body (not their head) to ensure appropriate spinal alignment on an adult board. (See figure below)

✆ Contact OLMC for further instructions if the patient refuses immobilization despite the provider's assessment for the need for SMR.



Appendix

List of approved medications and their uses per Utah State EMS Protocol Guidelines. Any medication not listed will need to have a variance approval from Utah State Medical Director.

Medication	EMR	EMT	AEMT	Paramedic
Acetaminophen			X	X
Adenosine				X
Albuterol		X	X	X
Amiodarone			X	X
Aspirin		X	X	X
Atropine			X	X
Blood Product				X
Calcium (Chloride/gluconate)				X
Diazepam			X	X
Diphenhydramine			X	X
Dextrose			X	X
Epinephrine	Auto-injector	X	X	X
Fentanyl			X	X
Glucagon			X	X
Glucose (Oral)		X	X	X
Haloperidol				X
Hydroxocobalamin			X	X
Ibuprofen			X	X
Ipratropium			X	X
Ketamine				X
Ketorolac			X	X
Lidocaine			X	X
Lorazepam			X	X
Magnesium Sulfate				X
Morphine			X	X
Midazolam			X	X
Naloxone	X	X	X	X
Nitroglycerin		X	X	X
Norepinephrine				X
Ondansetron			X	X
Oxytocin			X	X
Promethazine				X
Sodium Bicarbonate				X
Tranexamic Acid (TXA)				X

Acetaminophen
- Pain Management
- Altitude Related Illnesses
- Fever Management

Adenosine
- Tachycardia (With a Pulse)

Albuterol
- Anaphylaxis / Allergic Reaction
- Drowning or Submersion
- Obstetrical Emergency
- Respiratory Distress

Amiodarone
- Cardiac Arrest

Aspirin
- Cardiac Chest Pain

Atropine
- Bradycardia (Symptomatic)
- Toxic Exposure - Organophosphate / Nerve Agent

Blood Product
- Blood Product Transfusion

Calcium (Chloride or gluconate)
- Blood Product Transfusion
- Cardiac Arrest
- Toxic Exposure - Hydrofluoric Acid

Diazepam
- Pain Management
- Behavioral Emergency
- Seizures
- Temperature & Environmental Emergency

Diphenhydramine
- Anaphylaxis / Allergic Reaction

Dextrose
- Newborn Resuscitation
- Hypoglycemia / Hyperglycemia

Epinephrine
- Shock, Sepsis & Fluid Therapy
- Bradycardia (Symptomatic)
- Cardiac Arrest
- Congestive Heart Failure / Pulmonary Edema
- Newborn Resuscitation
- Post Cardiac Arrest (ROSC)
- Anaphylaxis / Allergic Reaction
- Drowning or Submersion
- Opioid Overdose
- Respiratory Distress
- Toxic Exposure - Carbon Monoxide

- Toxic Exposure - Cyanide
- Head Injury (TBI)
- Envenomation

Fentanyl
- Pain Management
- Procedural / Post ROSC Sedation

Glucagon
- Hypoglycemia / Hyperglycemia

Glucose (Oral)
- Hypoglycemia / Hyperglycemia

Haloperidol
- Behavioral Emergency

Hydroxocobalamin
- Toxic Exposure - Carbon Monoxide
- Toxic Exposure - Cyanide

Ibuprofen
- Pain Management
- Altitude Related Illnesses
- Fever Management

Ipratropium
- Respiratory Distress

Ketamine
- Pain Management
- Procedural / Post ROSC Sedation
- Behavioral Emergency

Ketorolac
- Pain Management

Lidocaine
- Cardiac Arrest
- Respiratory Distress

Lorazepam
- Pain Management
- Behavioral Emergency
- Seizures
- Temperature & Environmental Emergency

Magnesium Sulfate
- Cardiac Arrest
- Obstetrical Emergency
- Respiratory Distress
- Seizures
- Toxic Exposure - Hydrofluoric Acid

Morphine
- Pain Management

Midazolam
- Procedural / Post ROSC Sedation
- Behavioral Emergency
- Seizures
- Temperature & Environmental Emergency

Naloxone
- Altered Mental Status
- Cardiac Arrest
- Opioid Overdose

Nitroglycerin
- Cardiac Chest Pain
- Congestive Heart Failure / Pulmonary Edema

Norepinephrine
- Shock, Sepsis & Fluid Therapy
- Congestive Heart Failure / Pulmonary Edema
- Post Cardiac Arrest (ROSC)
- Anaphylaxis / Allergic Reaction
- Drowning or Submersion
- Opioid Overdose
- Head Injury (TBI)
- Envenomation

Ondansetron
- Nausea & Vomiting
- Altitude Related Illnesses

Oxytocin (Pitocin)
- Obstetrical Emergency

Promethazine
- Nausea & Vomiting

Sodium Bicarbonate
- Cardiac Arrest
- Opioid Overdose

Tranexamic Acid (TXA)
- Obstetrical Emergency
- General Trauma Management
- ENT / Dental / Fractures / Crush Injuries
- Head Injury (TBI)