Utah EMS Protocol Guidelines

Utah Department of Health & Human Services

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Guidelines Changes Since Publication

Date	Guideline	Change
02/17/2023	HEMORRHAGE CONTROL, EXTREMITY AND CRUSH INJURIES	Added: Under the Paramedic side on pediatrics • Tranexamic Acid (TXA) Please contact medical control for consideration in use in pediatrics.

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 the OEMSP 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.
- 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.
- 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.

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.

AIRWAY AND 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, ETCO2, blood pressure, and pulse oximetry monitoring, 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 ETCO2 of 35-45.
  - Always ensure proper care of the C-spine during airway treatment per the ***Spinal Motion Restriction Guideline***.
  - 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 below the age of 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 less 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 and can be dangerous to the patient if done incorrectly, see appendix for more details)
    - If unable to ventilate, suction the tracheostomy, then reattempt ventilatory efforts.
    - If still unable to ventilate, attempt traditional BVM
    - If there is difficulty ventilating a tracheostomy patient, consider "D.O.P.E." (Dislodged? Obstruction? Pneumothorax? Equipment failure?)

ADULT

EMT

- ❑ Ventilate with BVM when apneic or exhibiting respiratory distress. Consider a nasal or oral

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

EMT

- ❑ Ventilate with BVM when apneic or exhibiting respiratory distress. Consider a nasal or oral

airway when not contraindicated (facial fractures, intact gag response, etc).

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

airway 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

AEMT

- ❑ Consider an appropriately-sized supraglottic airway device if unable to ventilate with BVM
  - Document confirmation via ETCO2 waveform capnography and document lung sounds.
- ❑ **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 manufacturer instructions.
  - If unable to adequately ventilate, return to BVM and consider insertion of supraglottic airway and bag ventilation.
- ❑ **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.
  - Explain the procedure to the patient
  - Initially apply the nasal cannula device and begin flow according to manufacturer instructions.
  - If unable to adequately oxygenate, return to BVM and consider insertion of supraglottic airway and bag ventilation.

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

AEMT

- ❑ Consider an appropriately-sized supraglottic airway device if unable to ventilate with BVM
  - Document confirmation via ETCO2 waveform capnography and document lung sounds.
- ❑ **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.
- ❑ **High Flow Nasal Cannula (HFNC)** – Consider when the patient is awake but needs assistance with oxygenation and ventilation.
  - Explain the procedure to the patient/parent
  - Initially apply the nasal cannula device and begin flow according to manufacturer instructions.
  - If unable to adequately oxygenate, return to BVM and consider insertion of supraglottic airway and bag ventilation.

PARAMEDIC

- ❑ **Endotracheal Intubation** - Consider orotracheal intubation using an endotracheal tube (ETT) when indicated
  - Video laryngoscopy is the preferred method for achieving ET intubation.

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 ETCO2 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.

❑ **Surgical Airway - Cricothyrotomy** - Consider only when all other methods of oxygenation, ventilation and securing the airway have failed.
- Document confirmation via ETCO2 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.

❑ **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 endotracheal tube use BVM, orotracheal intubation or Supraglottic device to ventilate the patient.

✆ 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.

- Document confirmation via ETCO2 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 is indicated. In the rare instance that a supraglottic airway is ineffective, then proceed to ETT
- For longer transports, be aware of gastric distension during BVM, which may limit ventilation. An NG/OG tube can be placed to decompress the stomach
- Pediatric ETT's are sized according to age and utilize pediatric reference guide. Formula (age+16)/4 can be substituted in lieu of reference guide.
- Document confirmation via ETCO2 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.

❑ **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 below 12 years of age.
- Document TWO confirmation via ETCO2 waveform capnography and document lung sounds.
- Gather all equipment before beginning the procedure.
- Once the procedure is done insert an appropriately sized cuffed ETT and secure.

✆ Contact OLMC for further instructions as needed.

❑ **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

- 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, orotracheal intubation or SGD

✆ 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.

ALTERED MENTAL STATUS

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Blood glucose, oxygen saturation and temperature assessment
- ❑ Continuous cardiac, ETCO2, blood pressure, and pulse oximetry monitoring, when available.
- ❑ Obtain a 12 Lead EKG when available
- ❑ **Treatment Plan**
  - Assess for trauma.
  - Assess for stroke and score per the ***Suspected Stroke Guideline***.
  - Assessment for possible overdose, substance abuse or other potential toxin exposure. Evaluate the scene for supportive evidence.
  - Gather and collect any evidence on scene that may assist in the treatment of the patient (medication bottles, pills, notes, etc.)
- ❑ **Key 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

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

AEIOUTIPPS: Possible causes of Altered Mental Status

ADULT

EMT

- ❑ Apply supplemental oxygen as needed to maintain oxygen saturation of 90-94%
- ❑ Apply warming or cooling techniques as indicated
- ❑ Consider physical restraints as needed to protect the patient and/or rescue personnel
- ❑ **Naloxone** 2-4 mg (per dose) IM/IN (intranasal) for suspected narcotic overdose. May repeat as clinically indicated.

AEMT

- ❑ **Naloxone** 0.4–4 mg (per dose) IV for suspected narcotic overdose. May repeat as clinically indicated

PEDIATRIC (<15 years of Age)

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

EMT

- ❑ Apply supplemental oxygen as needed to maintain oxygen saturation of 90-94%
- ❑ Apply warming or cooling techniques as indicated
- ❑ Consider physical restraints as needed to protect the patient and/or rescue personnel
- ❑ **Naloxone** 0.1 mg/kg (max 2mg per dose) IM/IN (intranasal) for suspected narcotic overdose. May repeat as clinically indicated.

AEMT

- ❑ **Naloxone** 0.4–2 mg (per dose) IV for suspected narcotic overdose. May repeat as clinically indicated

- ❑ Advanced airway, vascular access and fluid therapy
- ❑ Consider chemical restraints per the ***Behavioral Emergency Guideline***, as needed, to protect the patient and/or rescue personnel
- ❑ If patient is hypoglycemic, refer to hypoglycemia protocol

PARAMEDIC

- ❑ Advanced airway, vascular access and fluid therapy
- ❑ If evidence of poor perfusion, give NS 20mL/kg IV max 1 L
- ❑ Consider chemical restraints per the ***Behavioral Emergency Guideline ,*** as needed, to protect the patient and/or rescue personnel
- ❑ If patient is hypoglycemic, refer to hypoglycemia protocol

PARAMEDIC

DEATH DETERMINATION AND 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 greater than 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 greater than 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.
      - 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 <u>with the concurrence of OLMC</u>:
    - 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

✆ Must contact OLMC for approval prior to termination of resuscitation efforts

- **Special Considerations for Resuscitation**
  - Consider transporting traumatic and non-traumatic pediatric arrests to the hospital after 15 minutes of on-scene resuscitation with resuscitative efforts carried out 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
  - Dangerous, violent or otherwise unsafe or difficult scene situation. EMS personnel safety and patient respect are of the utmost importance. Assessing the scene to ensure a safe and secure environment to continue resuscitation is important. If there are any concerns about scene safety or personnel security, the patient should be promptly loaded and transported to the hospital.
  - Pregnant mother >25 weeks pregnant. Initiate early hospital transport for possible advanced care and possible delivery of the baby
- Following determination of obvious death or termination of resuscitative efforts:
  - Call dispatch to reduce any responding transport(s) to non-emergent
  - Document time of death and circumstances according to system and agency guidelines
  - Turn the body over to the appropriate law enforcement agency
  - Evaluate for, document, and report any indication of non-accidental trauma per the ***Non-Accidental Trauma/Abuse Guidelines***
  - Contact the closest patient receiving facility and make them aware of the actions taken, declare a time of death and explain the disposition of the patient

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

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.

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 the 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 that 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.
- ❑ **Key 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.

ADULT

EMT
AEMT
PARAMEDIC

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

EMT
AEMT
PARAMEDIC

NAUSEA / VOMITING

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
  - Blood glucose, temperature and oxygen saturation assessment
- ❑ Continuous cardiac, ETCO2, blood pressure, and pulse oximetry monitoring, when available
- ❑ **Treatment Plan**
  - Nothing by mouth (NPO)
  - Place the patient in an upright or lateral recumbent position
  - Obtain a 12 lead EKG, if available, for:
    - Greater than 40 years old
    - Associated with chest or 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

AEMT

- ❑ Vascular access and fluid therapy
- ❑ Document level of consciousness before and after giving medication
- ❑ **Ondansetron** 4mg-8mg IV/IM/PO/ODT
- ❑ **Prochlorperazine** 5mg IV/IM
- ❑ **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
  - **Promethazine** 25 mg IM, if no vascular access

PARAMEDIC

PEDIATRIC (<15 years of Age)

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

AEMT

- ❑ Vascular access and fluid therapy
- ❑ Document level of consciousness before and after giving medication.
- ❑ **Ondansetron (Zofran)**
  - **> 2 years old- 0.1mg/kg** IV/IM/PO once (max 4mg)
  -
- ✆ **< 2 years old, requires OLMC contact**
- ✆ **Promethazine (Phenergan) – NOT recommended**, requires OLMC contact.

PARAMEDIC

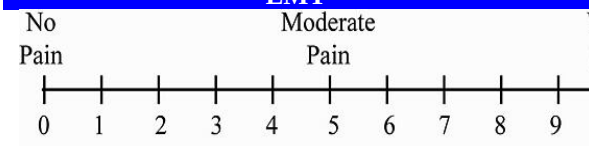
PAIN MANAGEMENT

ALL PROVIDERS

- ❑ Focused history and physical exam
- ❑ Assess the patient's pain using verbal and non-verbal cues and appropriate pain scale
- ❑ Continuous cardiac, ETCO2, blood pressure, and pulse oximetry monitoring, when available (mandatory for ketamine use)
- ❑ 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
    - Avoid or stop giving medications if SBP <100mmHg in adults, SBP <70 + (age in years x 2) mmHg for pediatrics, SaO2 < 90% without oxygen, or GCS <14
    - Stop pain medication dosing when the patient has adequate relief, pain score <5, adult SBP <100mmHg, peds SBP <70 + (age in years x 2) mmHg, SaO2<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
    - Agitated/Combative protocol should not be used in conjunction with pain management
- ❑ **Key Considerations**
  - 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

ADULT

EMT



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

EMT

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 antiemetic's prior to pain management**
  - **Maximize dosing of a single agent before using additional agents**

Pain Control

- ❑ **Acetaminophen** 500-1000 mg PO/IV(infusion over 15 min), single dose only
- ❑ **Ibuprofen** 600mg PO, single dose only
- ❑ **Ketorolac** 15mg IV, 30mg IM, single dose only
- ❑ **Morphine Sulfate** 2-10 mg q5 minutes IV/IO/IM titrated to effect. (Max 15mg)
- ❑ **Fentanyl** 25-100 mcg q10 minutes IV/IO/IM/IN. (Max 200mcg)

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

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 antiemetic's prior to pain management**
  - **Maximize dosing of a single agent before using additional agents**

Pain Control

- ❑ **Acetaminophen** 15mg/kg PO/IV(infusion over 15 min), single dose only. Max dose 650mg
- ❑ **Ibuprofen** 10mg/kg 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.
- ❑ **Fentanyl** 1 mcg/kg (max 50 mcg per dose) IV/IM/IO. Use 2 mcg/kg for IN (intranasal) (max 100 mcg per dose). May repeat x 1 if needed after 10-15 min
- ❑ **Morphine Sulfate** 0.1 mg/kg (max of 4 mg per dose) IV/IM/IO titrated to effect

✆ For additional doses, contact OLMC

PARAMEDIC

- ❑ **Ketamine** 40mg diluted in 100mL of normal saline IV/IO infused over 15 minutes OR until analgesia is attained. May halt infusion if pain relief obtained before full dose administered.
  - **IV/IO** – 10-20mg every 5 minutes to the desired effect or max dose of 40mg

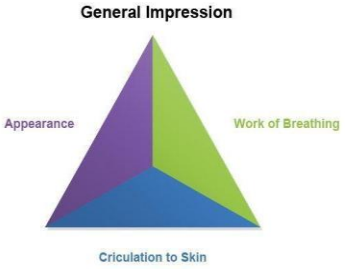
PARAMEDIC

- ❑ **Ketamine** 0.15-0.3 mg/kg (max 40 mg) diluted in 100mL of normal saline IV/IO infused over 15 minutes ONLY FOR USE in patients over the age of 2 years. May halt infusion if pain relief obtained before full dose administered.

PEDIATRIC ASSESSMENT

ALL PROVIDERS / EMT

- ❑ 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, ETCO2, and pulse oximetry monitoring, 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 to 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 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. Look on scene for the CHIRP red bag which contains current medical information on the child with special healthcare needs, or ask guardian if they have a written medical plan.

ADULT PEDIATRIC (<15 years of Age)

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

AEMT
PARAMEDIC

AEMT
PARAMEDIC

SHOCK, SEPSIS, & FLUID THERAPY

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
  - Blood glucose, oxygen saturation and temperature assessment
  - Consider shock in patients with one or more of the following:
    - Vital signs: HR >100, SBP of <90mmHg for adults, SBP <70 + (age in years x 2) mmHg for children, or RR >20 BPM
    - Skin signs: cold clammy skin, febrile, or delayed capillary refill
    - Mental status: altered, lethargic, or irritable (esp. in infants).
- ❑ Evaluate for the source of shock including distributive (e.g. infection, anaphylaxis), hypovolemic (e.g. hemorrhagic, vomiting/diarrhea, heat exposure), neurologic (i.e. spinal injury), or cardiogenic
- ❑ **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:
    - Temp >100.4 °F (38°C) or <96.8°F (36°C)
    - RR >20 BPM
    - Heart Rate >90 bpm

  OR
  - Signs of hypoperfusion – SBP <90mmHg or MAP <65mmHg or ETCO2 <25
- ❑ Continuous cardiac, ETCO2, and pulse oximetry monitoring, when available
- ❑ Obtain a 12 Lead EKG when available
- ❑ **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 R side 30-45 degrees
  - 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

AEMT

- ❑ Vascular access
  - Insert 2 large bore IVs
- ❑ **Traumatic Shock – Permissive Hypotension**
  - If SBP >80-90 (intact radial pulse):
    - No IV fluid bolus
    - Place saline locks on IVs or run at TKO rate
  - If SBP <80-90:
    - Give fluid bolus 500mL at a time, reassess and repeat as needed to:

PEDIATRIC (<15 years of Age)

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

AEMT

- ❑ Vascular access
  - Insert 2 large bore IVs
- ❑ **Traumatic Shock** – Give fluid bolus of NS 20 mL/kg at a time (max 1L) reassess and repeat up to a maximum of 60 mL/kg total (Max 3L); Reassess for reversal of the signs of shock

  ✆ If the patient remains hypotensive after 60mL/kg (max 3L) of NS call OLMC
- ❑ **Non- Traumatic Shock** - Provide 20mL/kg (max 1 L) boluses up to a maximum of 60mL/kg and reassess for reversal of the signs of shock

- Maintain SBP to 80-90 mmHg **WITHOUT** a CLOSED HEAD INJURY.
- Maintain SBP to 110-120 mmHg **WITH** a CLOSED HEAD INJURY.

- Once minimum blood pressures have been achieved the patient should have a saline lock and no further fluid boluses should be administered unless the BP falls below the limits.

❑ **Non-Traumatic Shock** – Give IV NS bolus 500 ml at a time, reassess and repeat up to a maximum of 2 liters as required for reversal of signs of shock

- **Push Dose Epinephrine** 10mcg as needed to maintain a SBP >100 mmHg after fluid bolus

✆ Call OLMC if the patient remains hypotensive after 2 liters has been administered

❑ **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 up to a maximum of 1 liter and reassess for reversal of the signs of shock

- **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus

✆ Call OLMC if the patient remains hypotensive after 60mL/kg (max 3L) of NS

❑ **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

✆ Call OLMC if the patient remains hypotensive after 20 ml/kg has been administered

PARAMEDIC

FOR USE ONLY IN NON-TRAUMATIC SHOCK

❑ **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg

❑ **Norepinephrine** 0.1–0.5 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP > 100 mmHg.

PARAMEDIC

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

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 OEMSP 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.

BRADYCARDIA (Symptomatic)

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
  - Assess for signs of poor perfusion, hypotension or other signs of shock, altered mental status, ischemic chest pain, or acute heart failure.
  - Obtain a blood glucose level.
- ❑ Continuous ECG, ETCO2, 12 lead ECG (when stable), and pulse oximetry monitoring, blood pressure, when available
- ❑ **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 and signs of poor perfusion following aggressive oxygenation and ventilation: ***Begin Chest Compressions***
- ❑ **Key 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

AEMT

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

PEDIATRIC (<15 years of Age)

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

AEMT

- ❑ Vascular access and fluid therapy
- ❑ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus
- ❑ **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 1 mg for child and 2 mg for adolescents.

PARAMEDIC

SYMPTOMATIC BRADYCARDIA

- ❑ **Transcutaneous pacing (TCP)** at an initial rate of 80 beats per minute if the patient does not respond to medications. Ensure mechanical and electrical capture.
- ❑ **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
- ✆ **Contact OLMC for dosages above those provided or use of medication NOT fitting the guideline parameters**.

PARAMEDIC

SYMPTOMATIC BRADYCARDIA

- ✆ **Transcutaneous pacing (TCP)** at an initial rate of 100 beats per minute, if the patient does not respond to medications. Ensure mechanical and electrical capture.
- ✆ **Contact OLMC for dosages above those provided or use of medication NOT fitting the guideline parameters**
- ✆ **Epinephrine** 0.05–1 mcg/kg/min IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg
- ✆ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus

CARDIAC ARREST

ALL PROVIDERS / EMT

For Traumatic Arrest refer to General Trauma Management Guidelines

- ❑ Focused history and physical exam
  - Assess for evidence that resuscitation should not be attempted per the ***Death Determination Guideline***.
- ❑ Continuous ECG, ETCO2, 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 Considerations**
  - Effective chest compressions are critical
    - Consider ventilating adult patients with a pediatric BVM bag to avoid hyperinflation
    - 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
    - If using mechanical CPR:
      - Apply device with minimum interruption in CPR
      - Check rhythm every 2 minutes. When an organized rhythm is present, check pulse(5 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 patients left. If unable to perform manual displacement, place wedge-shaped cushion or multiple pillows under patient's right hip to achieve 30 degree 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

EMT

❑ **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

❑ **Respiratory Management:** Use a 30:2 compressions to ventilations ratio

AEMT

ALL RHYTHMS

❑ Begin CPR

❑ Vascular access and fluid therapy**.**

❑ Consider placement of a supraglottic device without interrupting CPR

❑ **Epinephrine:** 1 mg (10 ml of 0.1 mg/ml/1:10,000) 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, with epinephrine given via IV route, and with shorter dosing intervals (every 2 min)
- Unless a clear response to epinephrine is observed, consider a ***limit of 3 total doses***.

❑ Consider NS 1000 mL IV/IO bolus if hypovolemia suspected

PEDIATRIC (<15 years of Age)

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

EMT

❑ **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

❑ **Respiratory Management:**
- Place an NP or OP airway and use a 30:2 compressions to ventilation ratio

AEMT

ALL RHYTHMS

❑ Begin CPR

❑ BVM, supraglottic airway, vascular access and fluid therapy

❑ **Epinephrine:** 0.01 mg/kg (0.1 mg/ml / 1:10,000) IV/IO every 2-4 min as long as the patient remains pulseless. Note that better outcomes are observed with earlier administration of epinephrine, with epinephrine given via IV route, and with shorter dosing intervals (every 2 min)
- Max dose = 1 mg (10 ml)
- Unless a clear response to epinephrine is observed, consider a limit of 3 total doses.
- Consider NS 20 ml/kg IV/IO bolus if hypovolemia suspected, reassess and repeat if needed to a Max of 60 mL/kg

SHOCKABLE RHYTHM (VF/VT) PRESENT

- ❑ **Defibrillation**
- ❑ **360J** for a monophasic defibrillator or **120-360J** for a biphasic, with escalating energy for subsequent shocks (Follow manufacturer's recommendations)
- ❑ Resume CPR immediately after shock and continue for 2 minutes
- ❑ Check rhythm and pulse every 2 min
- ❑ **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** 1 mg/kg IV/IO/ET. May repeat every 3-5 min up as needed up to 3 mg/kg.
      - Follow with continuous infusion (1 to 4 mg/minute) after return of perfusion.

✆ Contact OLMC before terminating resuscitative efforts in the field

PARAMEDIC

ALL RHYTHMS

- ❑ May consider endotracheal intubation, if unable to adequately ventilate with supraglottic airway, ***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 2 gm IV/O over 2 min

✆ Contact OLMC for further orders or therapies

SHOCKABLE RHYTHM (VF/VT) PRESENT

- ❑ **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
- ❑ **Anti-arrhythmics are indicated for shockable rhythms that are unresponsive to defibrillation**
  - May administer either **ONE** these antiarrhythmics:
    - **Amiodarone** 5 mg/kg IV/IO (max 300mg/dose). May repeat 2 more times every 5 min as needed. (Total max 450mg)
    - **Lidocaine** 1 mg/kg IV/IO/ET. May repeat every 3-5 min up to 3 mg/kg.
      - Maintenance 20-50 mcg/kg/min

✆ Contact OLMC before terminating resuscitative efforts in the field

PARAMEDIC

ALL RHYTHMS

- ❑ May consider endotracheal intubation, if unable to adequately ventilate with BVM (preferred) or supraglottic airway, ***per Airway and Tracheostomy Management Guideline.***
- ❑ 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 50 mg/kg (Max = 2,000 mg) IV/O over 2 min

✆ Contact OLMC for further orders or therapies

POST CARDIAC ARREST

RETURN OF SPONTANEOUS CIRCULATION (ROSC)

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
  - Blood glucose assessment may be performed but need not be part of intra-arrest management
- ❑ Continuous ECG, ETCO2, and pulse oximetry monitoring, when available
- ❑ Assist ventilations to maintain ETCO2 35-45mmHg
- ❑ Document blood pressure after establishing ROSC
- ❑ 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:
  - Acquire and transmit a 12-Lead EKG after establishing ROSC unless clear non-cardiac cause
  - 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.

ADULT

AEMT

- ❑ Refer to airway management, vascular access and fluid therapy guidelines as needed
- ❑ **Push Dose Epinephrine** 10mcg as needed to maintain a SBP >100 mmHg after fluid bolus

PARAMEDIC

PEDIATRIC (<15 years of Age)

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

AEMT

- ❑ Refer to airway management and vascular access and fluid therapy guidelines as needed
- ✆ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (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** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
- ❑ **Norepinephrine** 0.1-0.5 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

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 or O-L-D-C-A-R-T mnemonic.
    - Onset of the event, Provocation or Palliation, Quality of the pain, Region and Radiation, Severity, Time/Trend (history)
    - Onset of the event, Location of the Pain, Duration of the pain, Character of the Pain, Radiation, 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 ECG, CO2, pulse oximetry monitoring, blood pressure, and 12 lead ECG (with transmit capabilities) when available.
- ❑ For prolonged transports >15 minutes: serial 12 lead ECGs should be considered every 10 minutes until ED arrival
- ❑ **Treatment Plan**
  - Chest pain patients should only receive oxygen therapy as needed to target O2 saturations ~94%
- ❑ **Key Considerations**
  - Assess blood glucose level.

ADULT

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
  - Do not administer nitroglycerin if the patient (male or female) has taken erectile dysfunction medications within the last 24 hours

AEMT

- ❑ Vascular access and fluid therapy
- ❑ IV access prior to administration of nitroglycerin is preferable, if possible
- ❑ 12 Lead EKG (If available). Acquire and transmit.

PEDIATRIC (<15 years of Age)

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

EMT

AEMT

- ❑ Chest pain with cardiac origin is rare in children, consider other causes;
  - Asthma
  - Foreign body
  - Infection

- ❑ If the patient has a STEMI then transport to the closest available STEMI/PCI receiving center (if available) and give advanced notification of ECG findings and transmission of ECG 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.
  - Do not administer nitroglycerin if the patient (male of female) has taken erectile dysfunction medications within the last 24 hours
  - 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.

- Trauma

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, ETCO2, 12 lead ECG, and pulse oximetry monitoring, when available
- ❑ **Treatment Plan**
  - Maintain airway; assist with breathing as necessary, provide oxygen as needed to target SpO2 90-94%.
- ❑ **Key Considerations**
  - Do not use nitroglycerin if the patient has taken erectile dysfunction medications in the last 24 hours.
  - 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

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
  - Do not administer nitroglycerin if the patient (male or female) has taken erectile dysfunction medications within the last 24 hours
- ❑ **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.

AEMT

- ❑ Supraglottic device, vascular access and fluid as needed

PEDIATRIC (<15 years of Age)

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

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 device, vascular access and fluid as needed

- IV access prior to nitrates is preferred if possible
- Limit fluid bolus to 250–500 mL NS

❑ **Nitroglycerin** 0.4 mg SL every 5 minutes (max of 3 doses) if dyspnea or chest pain persist and SBP >90 mmHg.

❑ **Push Dose Epinephrine** 10 mcg as needed to maintain a SBP >100 mmHg after fluid bolus

PARAMEDIC

❑ **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg

❑ **Norepinephrine** 0.1–0.5 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP > 100 mmHg.

❑ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus

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

NEWBORN RESUSCITATION

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam: Term baby? Breathing? Tone?
- ❑ Continuous ECG, CO2, and pulse oximetry monitoring, 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, then 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. Goal of PEEP: 5-8 cm H20 (no more than 6)
      - 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 and increase O2% if no improvement; Target O2 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; titrate up O2 if HR remains <100 despite adequate PPV
    - **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
- ❑ **Key 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**

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 (0.1 mg/ml/1:10,000)** for HR <60/min despite 30 seconds of effective CPR with PPV. Repeat every 3-5 minutes until spontaneous heart rate remains >60 bpm

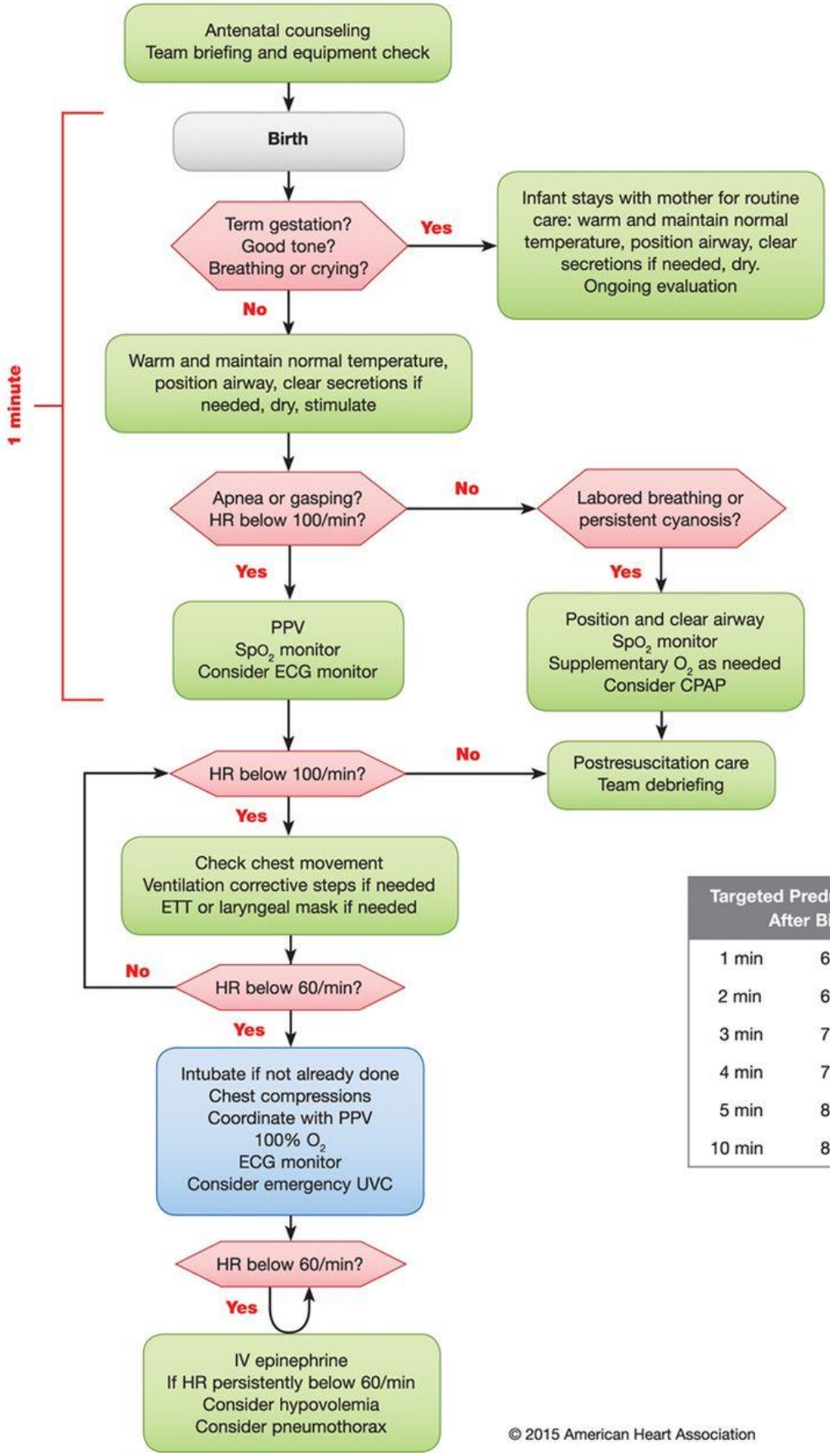
EVIDENCE OF HYPOPERFUSION OR HYPOVOLEMIA

- ❑ 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 then apply a meconium aspirator with appropriate pressure and remove the endotracheal tube. Repeat intubation may be indicated if this process is unsuccessful.
- ❑ **Epinephrine**: Endotracheal ET: (IV/IO route preferred) 0.05 to 0.1 mg/kg (0.5 to 1 mL/kg of 0.1 mg/mL (1:10,000) solution) every 3 to 5 minutes until IV access established or return of spontaneous circulation
- ❑ **Dextrose 10%** per ***Glucose Emergencies - Hypoglycemia/Hyperglycemia Guidelines***

Neonatal Resuscitation Algorithm—2015 Update



Targeted Preductal SpO_2 After Birth	
1 min	60%-65%
2 min	65%-70%
3 min	70%-75%
4 min	75%-80%
5 min	80%-85%
10 min	85%-95%

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TACHYCARDIA (With a Pulse)

ALL PROVIDERS

- ❑ Focused history and physical exam
  - Assess blood glucose level
- ❑ Continuous ECG, ETCO2, blood pressure, and pulse oximetry monitoring when available
- ❑ Acquire and transmit a 12-Lead EKG if possible.
- ❑ **Key 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

AEMT

Supraventricular Tachycardia (SVT)

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

PARAMEDIC

PEDIATRIC (<15 years of Age)

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

AEMT

Supraventricular Tachycardia (SVT)

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

PARAMEDIC

Supraventricular Tachycardia (SVT)

- ❑ **Adenosine**
  - Indicated for patients with prior SVT who have responded to adenosine previously
  - **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

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***
  - Consider pretreatment with a benzodiazepine

Supraventricular Tachycardia (SVT)

- ❑ **Adenosine**
  - Indicated for patients with prior SVT who have responded to adenosine previously
  - **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 dose is 0.5-1 J/kg
  - If no response, double energy dose to 2 J/kg
  - Consider pretreatment with a benzodiazepine.

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 OEMSP 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.

General Pediatric Considerations

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

ALLERGIC REACTION / ANAPHYLAXIS

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam.
- ❑ Cardiac monitor, ETCO2, and pulse oximetry monitoring, 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 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)
  - **Do not delay administering epinephrine.** Give IM epinephrine as soon as the diagnosis of anaphylaxis has been established.

ADULT

EMT

- ❑ **Administer epinephrine 1 mg/ml (1:1000)** for anaphylaxis by either:
  - **Epinephrine auto injector IM (0.3 mg)**
  - **Epinephrine 0.5mg IM** (0.5 mL of 1 mg/mL (1:1000)
- ❑ May repeat epinephrine dose every 5 minutes as needed
- ❑ If WHEEZING is present: Assist patient albuterol inhaler if wheezing is present (2 puffs). May repeat in 10 minutes
- ❑ O2 as needed to maintain SaO2 above 90%.

PEDIATRIC (<15 years of Age)

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

EMT

- ❑ Give or assist patient with **epinephrine auto injector ("Jr." 0.15 mg)** IM for severe respiratory distress and/or shock from anaphylaxis.
  - If >25kg, use adult autoinjector (0.3 mg) IM
- ❑ Administer **epinephrine 1 mg/ml (1:1000) 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
- ❑ If WHEEZING is present: Assist patient with own albuterol inhaler if wheezing is present (2 puffs). May repeat in 10 minutes
- ❑ O2 as needed to maintain SaO2 above 90%.

AEMT

- ❑ **Diphenhydramine** 1 mg/kg (Max 50 mg) IV/IO/IM for allergic reaction with urticaria/itching
- ❑ **Push Dose Epinephrine** 10mcg as needed to maintain a SBP >100 mmHg after fluid bolus
- ❑ If **WHEEZING** is present:
  - **Albuterol** 2.5 mg nebulized every 10 minutes until symptoms improve
- ❑ If **STRIDOR** is present:
  - **Epinephrine (1 mg/mL, 1:1000) 2mg** mixed with 3 mL of NS nebulized every 10 minutes until symptoms improve

PARAMEDIC

- ❑ **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
- ❑ **Norepinephrine** 0.1–0.5 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
- ❑ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus
- ❑ If **WHEEZING** is present:
  - **Albuterol** 2.5 mg nebulized every 10 minutes until symptoms improve.
- ❑ If **STRIDOR** is present:
  - **Epinephrine (1 mg/mL, 1:1000) 2mg** mixed with 3 mL of NS nebulized every 10 minutes until symptoms improve

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

ALTITUDE RELATED ILLNESSES

ALL PROVIDERS/EMT

- ❑ 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, ETCO2, and pulse oximetry, when available
- ❑ Consider 12 lead ECG
- ❑ **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.
    - O2 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 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 below 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.

AEMT

- ❑ Advanced airway, CPAP, vascular access and fluid therapy
- ❑ Ondansetron 4mg PO/IV for nausea/vomiting
- ✆ **Contact OLMC before terminating resuscitative efforts in the field**

PARAMEDIC

- ❑ May consider endotracheal intubation

BEHAVIORAL EMERGENCY

ALL PROVIDERS

- **Scene management**
  - Contact Law Enforcement if the patient is determined to be a threat to EMS providers, themselves, or others or if assistance with patient control is otherwise needed.
  - 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, and end-tidal C02 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
- Mandatory cardiac monitor, ETCO2, and pulse oximetry monitoring
- **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 and 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 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
  - 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.
  - Consider a reduction in the initial dosage of chemical restraint medications 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 procedural related anxiety management

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

ADULT

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**: cut dose in half if the patient is under the influence of narcotics or alcohol
- ❑ **Midazolam**
  - **IV/IO –** 5 mg, may repeat once in 10 minutes, if needed. Total max dose: 10mg
  - **Intranasal (IN) –** 5 mg**,** may repeat once in 10 minutes to a max dose of 10mg
  - **Intramuscular (IM) –** 10 mg once
- ❑ **Diazepam**
  - **IV/IO** – 5 mg every 10 min to the desired effect or max dosage of 20 mg
  - **Intramuscular (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
  - **Intramuscular (IM) –** 4 mg once

PARAMEDIC

- ❑ **Ketamine**
  - **Intramuscular (IM) –** 4 mg/kg once
  - **IV/IO –** 1 mg/kg once
- ❑ **Haloperidol**
  - **Intramuscular (IM) -** 5-10mg once
  - **IV/IO –** 2-5 mg once

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

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

EMT

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

AEMT

- ❑ Vascular access and fluid therapy
- ❑ **Benzodiazepines**: cut dose in half if the patient is under the influence of narcotics or alcohol
- ❑ **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
- ❑ **Diazepam**
  - **IV/IO -** 0.1 mg/kg (max 5 mg), may repeat once in 10 minutes, if needed. Total max dose: 10 mg
  - **Intramuscular (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
  - **Intramuscular (IM) –** 0.05 mg/kg (max 4 mg) 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.
- ❑ Cardiac monitor, ETCO2, pulse oximetry monitoring, blood pressure when available.
- ❑ **Treatment Plan**
  - Safely remove patient from the water
  - Place patient supine
  - Remove wet clothing and wrap in blankets
  - Ensure patient warmth
  - If concern for spinal injury refer to ***Spinal Motion Restriction Guideline.***
  - Scuba divers "Dive Computer" or Dive Log Book should be transported with the patient.
- ❑ **Key Considerations**
  - Airway maintenance is the primary consideration.
  - 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, and 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.
  - Cardiac arrest due to drowning and hypothermia (temperature <30 C/86 F): consider direct transport to ECMO center and DO NOT rewarm the patient
    - <15 years: Primary Children's Medical Center
    - >15 years: University of Utah Medical Center or Intermountain Medical Center

ADULT

EMT

- ❑ 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 a nasal or oral airway

PEDIATRIC (<15 years of Age)

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

EMT

- ❑ 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 a nasal or oral airway

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
- ✆ **Push Dose Epinephrine** 10 mcg as needed to maintain a SBP >100 mmHg after fluid bolus

PARAMEDIC

- ✆ **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
- ✆ **Norepinephrine** 0.1–0.5 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. Start with 1.25 mg if age <1yr
  - Reassess patient after each dose to determine need for additional dosing
- ❑ Consider CPAP in awake patients with respiratory distress
- ✆ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus

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 temperature.
- ❑ Cardiac monitor, ETCO2, and pulse oximetry monitoring, when available.
- ❑ **Treatment Plan**
  - If temperature is >100.4°F (>38.0°C) and the patient does not have any contraindications, consider antipyretic medications.
    - Ibuprofen is contraindicated in children <6 months old.
  - For temperatures greater than 103°F or 39.5°C
    - Begin passive cooling techniques including removing excess clothing.
  - For temperatures greater than 106°F or 41°C
    - Refer to the ***Temperature and Environmental Emergencies Guideline***.

ADULT

EMT

- ❑ **Acetaminophen** 650-1000 mg by mouth once
- ❑ **Ibuprofen** 600 mg by mouth once

AEMT

- ❑ Advanced Airway, IV/IO Access, and Fluid Therapy
- ❑ **Acetaminophen** 500-1000 mg PO/IV(infusion over 15 min), single dose only

PARAMEDIC

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

EMT

- ❑ **Acetaminophen** 15 mg/kg (max 650mg) by mouth or rectum once
- ❑ **Ibuprofen** 10 mg/kg (max 600mg) by mouth once. ***Contraindicated in children under 6 months old***

AEMT

- ❑ Advanced Airway, IV/IO Access, and Fluid Therapy
- ❑ **Acetaminophen** 15 mg/kg PO/IV(infusion over 15 min), single dose only. Max dose 650mg

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**
  - 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:
      - Using 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 patient's skin.
    - When mental status returns to normal, patient should be strongly encouraged to eat.
  - Criteria for 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 anti-hyperglycemic (e.g. Glyburide or Glipizide) medications for diabetes.
    - Not a suicide attempt by overdose
    - There is at least one responsible party that can assist them in their recovery and is comfortable in their care.
    - Children should be considered for transport for evaluation regardless of improvement in the field due to other possible etiologies for the episode.
- ❑ **Key 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

EMT

- ❑ **Dextrose Oral glucose** 15 grams if patient is able to protect airway
  - Repeat in 15 minutes as needed

AEMT

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

EMT

- ❑ **Dextrose Oral glucose** 7.5 grams if patient is able to protect airway
  - 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

HYPERGLYCEMIA
(W/ Altered Mental Status, Concern for DKA or HHS, or low ETCO2.)

- ❑ **Normal Saline 1000 mL** IV/IO over 30–60 minutes

PARAMEDIC

- ❑ 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 greater than 1 year
  - **Dextrose 25% 2 mL/kg** IV/IO: repeat as necessary (max 12.5G/ 50mL)
  - **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)

- ❑ **Normal Saline 20 mL/kg IV/IO** over 30–60 minutes for hyperglycemic patient

PARAMEDIC

OBSTETRICAL EMERGENCIES

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
  - Do not perform pelvic exam
- ❑ Cardiac monitor, ETCO2, and pulse oximetry monitoring when available.
- ❑ **Treatment Plan**
  - Imminent Deliveries: normal delivery procedures
    - Attempt to prevent explosive delivery.
    - As delivery occurs, 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.
    - 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 Situations – **TRANSPORT TO THE CLOSEST HOSPITAL**
    - **Excessive hemorrhage** following delivery or delayed placenta delivery.
      - Begin fundal massage immediately after placental delivery
      - Allow infant to nurse
      - High Flow O2
    - **Nuchal cord**: cord is wrapped around the infant's neck
      - Attempt to slip cord over the head.
      - If the cord is too tight to remove, immediately clamp in two places and cut between clamps.
    - **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 possible, 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. 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.

❑ **Key Considerations**
- Attempt to create a sanitary environment
- Transport in left lateral decubitus position

ADULT

AEMT

❑ Shock,Sepsis, and fluid therapy
❑ Treat seizures as per ***Seizure Guideline***

PARAMEDIC

❑ **Tranexamic Acid (TXA)** 1 gram IV if within 3 hours of delivery for postpartum hemorrhage.
❑ **Oxytocin** 10 units IM for postpartum hemorrhage after placental delivery after placenta delivery .
❑ **Oxytocin Infusion may be started if bleeding continues:**
- **IM 10 units followed by IV/IO Infusion by adding 10-40 units to 500mL or 1000mL NS** and titrating the infusion to decrease bleeding and patient comfort

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

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

AEMT

❑ Shock, Sepsis, and fluid therapy
❑ Treat seizures as per ***Seizure Guideline***

PARAMEDIC

❑ Refer to the ***Newborn Resuscitation Guideline***

✆ **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 monitor, ETCO2, and pulse oximetry monitoring, when available.
- ❑ 12-lead ECG, 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.
- ❑ **Key Considerations**
- ❑ **Release on Scene**
  - 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.
  - May contact Poison Control 1-800-222-1222
  - With some new opiates, very large doses of naloxone may be required to restore respirations. If no results with 2-3 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 "pink sheet" and assisting with patient control during transport.
  - In cases of reported **heroin-only** overdose, patients should be offered ED transport, but if they refuse they may be left on scene after naloxone administration if:
    - An attendant and second dose of naloxone is available or provided for any patient left on scene.
    - There is a responsible person on scene who is not intoxicated and can and will care for the patient.

ADULT

EMT

- ❑ **Naloxone** 0.4–2 mg (per dose) IN (intranasal) for suspected opioid overdose. May repeat as necessary to maintain respirations.
- ❑ IM route may be used if unable to administer IN

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

EMT

- ❑ **Naloxone** 0.1 mg/kg (max 2mg per dose) IN (intranasal) for suspected opioid overdose. May repeat as needed to maintain respirations
- ❑ IM route may be used if unable to administer IN

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 to maintain respirations
- ✆ **Push Dose Epinephrine** 10mcg 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** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
- ✆ **Norepinephrine** 0.1–0.5 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
- ❑ **Naloxone** 0.1 mg/kg (max 2 mg per dose) IV/IM/IO/IN for suspected narcotic overdose. May repeat as needed to maintain respirations
- ✆ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus

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 ***Allergic Reaction/Anaphylaxis Guideline***
  - Determine the need to treat under the ***Congestive Heart Failure Guideline***
  - Assess blood glucose, temperature and oxygen saturation
- ❑ Cardiac monitor, ETCO2, and pulse oximetry monitoring, when available
- ❑ Consider a 12 lead EKG
- ❑ **Treatment Plan**
  - **Choking**: Attempt to alleviate any obvious obstructions to the airway
    - For choking infants apply a sequence of 5 back blows and 5 chest thrusts until the item is dislodged
    - For choking adults and children, use the abdominal thrust ("Heimlich") maneuver.
  - Maintain airway, administer 10-15 lpm of oxygen via NRB
- ❑ **Key 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 if children have a RR >60
  - **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 less than 10 seconds

ADULT

EMT

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

AEMT

- ❑ Advanced airway, vascular access and fluid therapy
- ❑ For **ANAPHYLAXIS**:
  - See ***Anaphylaxis/Allergic Reaction Guideline***
- ❑ For **WHEEZING**:
  - **Albuterol** 2.5 mg/3cc NS nebulized
  - **Ipratropium** 0.5mg x1 nebulized treatment.
  - Repeat nebs every 10 min as needed

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

EMT

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

AEMT

- ❑ Advanced airway, vascular access and fluid therapy
- ❑ For **ANAPHYLAXIS**:
  - See ***Anaphylaxis/Allergic Reaction Guideline***
- ❑ For **WHEEZING**:
  - **Albuterol** 2.5 mg/3ml NS nebulized
  - Ipratropium 0.5mg x 1 nebulized treatment.
  - For infants < 1yr: **albuterol 2.5 mg** nebulized if wheezing persists after nasal suctioning

- Ipratropium and Albuterol may be combined (Duoneb)
- Patient respiratory status must be reassessed after each dose to determine need for additional treatment
- **Epinephrine 0.5 mg(1:1000 1mg/mL) IM** every 20 minutes as needed for acute severe asthma unresponsive to multiple doses of inhaled beta-agonists

❑ For **STRIDOR**:
- **Epinephrine (1:1000 1mg/mL) 2 ml (2mg)** mixed with 3mL of normal saline 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

- **Epinephrine IM (1:1000 1mg/mL) 0.01 mg/kg (Max 0.3 mg)** every 20 minutes as needed for Acute severe asthma unresponsive to inhaled beta-agonist

❑ For **STRIDOR**:
- **Epinephrine (1:1000 1mg/mL) 2mL (2mg)** added to 3mL of Normal Saline via nebulizer

❑ **BIPAP/CPAP** – 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** 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

✆ **Lidocaine 2%** 40-60 mg (2–3 mL) added to Albuterol for adult patients with "cough variant asthma" with severe coughing inhibits respiratory function (with or without audible wheezes)

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
  - Determine possibility of third trimester pregnancy, if appropriate
  - Assess scene for possible toxin, overdose or trauma
- ❑ Cardiac monitor, ETCO2, and pulse oximetry monitoring, when available
- ❑ **Treatment Plan**
  - Do not restrain, but do provide protection from injury during the tonic-clonic phase
  - Spinal motion restriction per ***Spinal Motion Restriction Guideline***
  - 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 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

ADULT

EMT

- ❑ Maintain open airway with patient in the recovery position
- ❑ Assist patient's family or caretaker with any home medication treatments

AEMT

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

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

EMT

- ❑ Maintain open airway with patient in the recovery position
- ❑ Assist patient's family or caretaker with any home medication treatments

AEMT

- ❑ Advanced airway, vascular access and fluid therapy
- ❑ **Benzodiazepines**: cut in half if the patient is under the influence of narcotics or alcohol
  - **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 (max10 mg), may repeat once in 5 minutes, if needed. Total max dose: 10 mg
  - **Diazepam**
    - **IV/IO -** 0.1 mg/kg (max 5 mg), may repeat every 5 minutes, if needed. Total max dose: 10 mg
    - **Intramuscular (IM):** 0.2 mg/kg (max 10 mg), may repeat every 10 minutes, if

- **IV/IO/IM –** 4 mg, may repeat every 5 minutes, if needed. Total max dose: 8 mg

✆ 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.

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.

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

PARAMEDIC

✆ **Magnesium Sulfate** – For pediatric patients who are pregnant and having a seizure contact OLMC

SUSPECTED STROKE

ALL PROVIDERS/EMT

- ❑ 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, blood pressure, ETCO2, 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 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 (tPA: alteplase/tenecteplase).
- ❑ **Destination guidelines for stroke patients:**
  - Types of stroke facilities and treatments offered:
    - **SRF**: Stroke Receiving Facility (IV tPA)
    - **PSC**: Primary Stroke Center (IV tPA)
    - **TSC**: Thrombectomy-Capable Stroke Center (IV tPA & thrombectomy)
    - **CSC**: Comprehensive Stroke Center (IV tPA & 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 tPA-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.
- ❑ **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 tPA and thrombectomy so should follow the same protocol as above.

ADULT

EMT

- ❑ Apply oxygen to maintain oxygen saturation 90 - 95%
- ❑ Evaluate and Document **Cincinnati Stroke Scale (CSS)** during assessment. The scale is positive (a stroke is likely) if ANY of following are abnormal:
  - **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)

AEMT

- ❑ Advanced airway, vascular access and fluid therapy

PARAMEDIC

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

EMT

- ❑ Apply oxygen to maintain oxygen saturation 90 - 95%
- ❑ Evaluate and Document **Cincinnati Stroke Scale (CSS)** during assessment. The scale is positive (a stroke is likely) if ANY of the following are abnormal:
  - **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)
  - **Arm Drift**
    - Normal: Both arms move equally or not at all
    - Abnormal: One arm does not move, or drifts down compared to the other
  - **Speech**
    - Normal: Patient uses correct words with no slurring
    - Abnormal: Slurred or inappropriate words or mute

AEMT

- ❑ Advanced airway, vascular access and fluid therapy

PARAMEDIC

TEMPERATURE AND ENVIRONMENTAL EMERGENCIES

ALL PROVIDERS / EMT

- ❑ 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 monitor, ETCO2, 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 (NOT Recommended for children and infants)
      - Aggressive cooling should be stopped if shivering begins.
      - 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 <30 C/86 F): consider direct transport to Primary Children's Medical Center for ECMO and **do NOT rewarm** this patient.
        - ➢ Adult cardiac arrest due to hypothermia (temperature <30 C/86 F): 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 Considerations**

- Avoid refreezing of cold extremities. If refreezing cannot definitely be avoided during transport, do not start the thawing process.

ADULT

AEMT

❑ Advanced airway, vascular access and fluid therapy

Heat Emergencies

- Cool fluid therapy: 500 – 1000 cc NS bolus
- Benzodiazepines for shivering:
  - **Midazolam**
    - IN/IM/IV/IO – 5 mg, may repeat once in 5 minutes, if needed. Total max dose: 10mg
  - **Diazepam**
    - IV/IO – 5 mg, may repeat every 5 minutes, if needed. Total max dose: 20mg
    - **Intramuscular (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

Cold Emergencies

- Warm fluid therapy: 500 – 1000 cc NS bolus

PARAMEDIC

❑ **Cold emergencies**

- Withhold anti-arrhythmic meds until temperature >86°F (30°C)

PEDIATRIC (<15 years of Age)

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

AEMT

❑ Advanced airway, vascular access and fluid therapy

Heat Emergencies

- Cool fluid therapy: 20 ml/kg IV bolus
- Benzodiazepines for shivering:
  - **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
  - **Diazepam**
    - IV/IO - 0.1 mg/kg (max 5 mg), may repeat every 5 minutes, if needed. Total max dose: 10 mg
    - **Intramuscular (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 2 mg), may repeat every 5 minutes, if needed. Total max dose: 4 mg.

Cold Emergencies

- Warm fluid therapy: 20 cc/kg NS bolus

PARAMEDIC

❑ **Cold emergencies**

- Withhold anti-arrhythmic meds until temperature >86°F (30°C)

TOXIC EXPOSURE - CARBON MONOXIDE

ALL PROVIDERS / EMT

- ❑ 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 monitor and ETCO2, 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 Considerations**
  - Patients with symptoms of headache, nausea, tachycardia, neurologic changes, or a CO monitor reading >10% should be transported.

ADULT

AEMT

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

PARAMEDIC

- ❑ **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) 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.

AEMT

- ❑ Advanced airway management, vascular access and fluid therapy
- ❑ **Closed Space Fires**
  - **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
- ✆ **Push Dose Epinephrine** 1 mcg/kg(Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus

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 / EMT

- ❑ 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 tapioca, lima beans, apricot seeds and 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)
    - Cardiac monitor, ETCO2, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
  - Administer high flow oxygen immediately and continuously
  - Pulse oximetry readings may not be accurate because of cyanide interaction
  - Cardiac monitor and ETCO2, when available

ADULT

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

PARAMEDIC

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

AEMT

- ❑ Advanced airway, vascular access and fluid therapy
- ✆ **Hydroxocobalamin** 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
- ✆ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus

PARAMEDIC

- ❑ **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a 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

TOXIC EXPOSURE - HYDROFLUORIC ACID

ALL PROVIDERS / EMT

- ❑ Scene Management
  - Industrial Exposures in which to consider 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
- ❑ Focused history and physical exam
- ❑ Cardiac monitor, ETCO2, and pulse oximetry monitoring, 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
    - **IV Calcium Gluconate & IV Magnesium:** for dermal exposures to high concentration (>20% HF) or large surface area of lower concentration (>5% TBSA)
  - **Eye Exposure**
    - Continuous rinsing for a minimum of 15 minutes or until a calcium ocular solution is available.
  - **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 by mouth (1 gram)
    - **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.
AEMT	**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

- ❑ 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

- ❑ **IV Calcium Gluconate & IV Magnesium**
  - 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 by mouth (1 gram) in 10ml
- ❑ **IV Calcium Gluconate** 100 mg IV (10 mL of a 10% solution) over 2-3 minutes.
- ❑ **IV Magnesium** 4 gm IV mixed in 50/100 ml of D5W/NS over 20 min

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, seizing, flaccid or apneic with any of the above
- ❑ Focused history and physical exam.
- ❑ Cardiac monitor, CO2, and pulse oximetry monitoring, when available
- ❑ **Treatment Plan**
  - Irrigate immediately
  - Remove clothing, jewelry etc. as irrigation is taking place
- ❑ **Key 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.

ADULT

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

AEMT
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

PEDIATRIC (<15 years of Age)

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

EMT

- ✆ Contact OLMC or Poison Control for instructions

AEMT
PARAMEDIC

- ✆ Contact OLMC or Poison Control for instructions

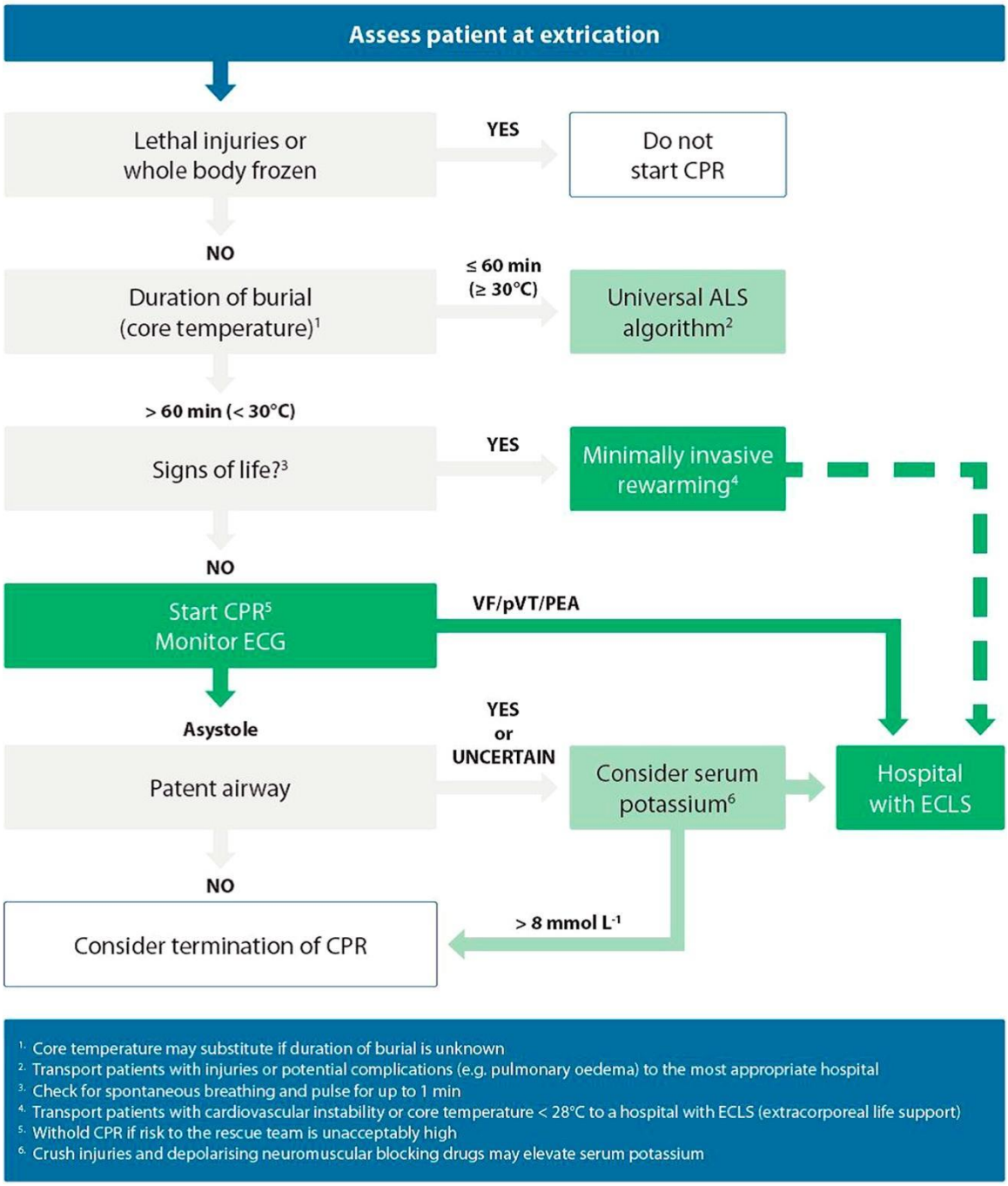
Avalanche Patient Care Guidelines

These guidelines were created to provide direction for each level of certified provider in caring for avalanche patients. 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 OEMSP 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
- Destination decisions should be in accordance with the ***Utah Avalanche Triage Guideline***
- Early notification allows the receiving physician to activate the receiving hospital's trauma alert and/or Extracorporeal Life Support (ECLS) alert system
- Providers should assess for and describe: vital signs (including GCS/AVPU), injuries, mechanism of injury and any complicating factors that will affect treatment (as per the Utah Trauma Field Triage Guidelines) so that the hospital may activate the appropriate level of ECLS and/or trauma response.
- Consider air transport for patient who meet ECLS criteria or critically injured patients with long transport times to a trauma center (over 60 minutes).
- Consider delivery to the nearest hospital if your patient is unstable for a prolonged transport or the patient has a compromised airway that you cannot secure.
- Consider that 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.

Utah Avalanche Triage Guideline



1. Core temperature may substitute if duration of burial is unknown
2. Transport patients with injuries or potential complications (e.g. pulmonary oedema) to the most appropriate hospital
3. Check for spontaneous breathing and pulse for up to 1 min
4. Transport patients with cardiovascular instability or core temperature < 28°C to a hospital with ECLS (extracorporeal life support)
5. Withold CPR if risk to the rescue team is unacceptably high
6. Crush injuries and depolarising neuromuscular blocking drugs may elevate serum potassium

Reference: Wilderness Environ Med. 2017 Mar; 28(1): 23-42.

AVALANCHE VICTIM MANAGEMENT

ALL PROVIDERS/EMT

- ❑ 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, ETCO2, and pulse oximetry, when available
- ❑ **Treatment Plan**
  - Assess airway patency, and clear airway if applicable
  - Assess for evidence that resuscitation should not be attempted per the ***Death Determination Guideline*** and/or if whole body frozen, decapitation, or hemicorporectomy have occurred.
    - **Note: that contrary to *General Trauma Management Guidelines,* care <u>should</u> still be initiated in apneic, pulseless patients.**
  - Assess for presence of pulse, respirations, and consciousness. If absent, initiate chest compressions and CPR per ***Cardiac Arrest Guideline.***
  - Focused history and physical exam
  - Assess risk of cervical spine injury per ***Selective Spinal Immobilization Guideline*** (Note that most avalanches are a high-risk mechanism)
  - Obtain core temperature as soon as possible
- ❑ **Key Considerations**
  - Scene times should be as short as possible for ECLS 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 <30°C (86°F), burial time > 60 minutes, AND patent airway at extraction should be preferentially transported to an ECLS facility, as per the ***Utah Avalanche Triage Guideline***
  - Otherwise, severely injured trauma patients should be preferentially transported to a trauma center, as per the ***Trauma Field Triage Guideline***
  - Treat hypothermia per the ***Temperature and Environmental Emergencies Guideline***
  - Consider prolonged CPR (>30 minutes) until the patient is rewarmed to a core temperature ≥30°C
  - Withhold or terminate CPR if risk to the rescue team is unacceptably high

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 OEMSP 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 ***Trauma Field Triage Guidelines***.
- Early notification allows the receiving physician to activate the receiving hospital's trauma alert system.
- Providers should describe: vital signs, including GCS/AVPU, injuries, mechanism of injury and any complicating factors that will affect treatment (as per the ***Trauma Field Triage Guidelines***) so that the hospital may activate the appropriate level of trauma response.
- Consider air transport for critically injured patients with long transport times to a trauma center (over (60 minutes).
- Consider delivery to the nearest hospital if your patient is *too* unstable for a prolonged transport or the patient has a compromised airway that you cannot secure.
- 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 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

The following 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 advanced or basic airway management techniques and the FSED is the closest ED
2. Traumatic cardiac arrest patients
3. Patients meeting Red or Yellow criteria of the Trauma Field Triage Guidelines.
4. Patients with head injuries who are over 65 years old OR who are taking anticoagulants
5. Patients with angulated long bone fractures
6. Patients with suspected open fractures or dislocations
7. EMS provider judgment

These guidelines may be modified during a disaster situation

GENERAL TRAUMA MANAGEMENT

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
- ❑ Continuous cardiac monitoring, ETCO2, and pulse oximetry, when available
- ❑ **Treatment Plan**
- ❑ **Primary Survey:**
  - Hemorrhage Control: Assess for and stop severe hemorrhage
  - Airway:
    - 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). These 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 5th intercostal space at the anterior axillary line is the preferred location for needle thoracostomy placement
      - If placing at the 5th ICS at the anterior axillary line, a 5 cm catheter should be the maximum length used to minimize risk of injury to vital structures
      - Minimum catheter length should be 5 cm (and 8 cm may be necessary) for 2nd ICS/mid-clavicular line needle thoracostomy placement
    - For open chest wound, place an occlusive dressing sealed on 3 sides
  - Circulation:
    - Assess vital signs / check for radial pulse
    - If pelvis is unstable (based on lateral compression), place pelvic binder to stabilize pelvis
  - 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
    - Prevent hypothermia by removing wet clothing, providing passive rewarming, and use of warmed IV fluids (if fluids indicated)
  - Treat for pain per the ***Pain Management Guideline***.
- ❑ **Key Considerations**
  - Scene times should be as short as possible for severely injured patients (Goal: 10 minutes). Perform required procedures enroute to the trauma center.
  - Severely injured trauma patients should be preferentially transported to a state-certified trauma center, as per the ***Field Trauma Triage Guideline.***
  - **Withholding and termination of resuscitative efforts**
    - Resuscitative efforts should be withheld for trauma patients with 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 the cardiac monitor
    - Resuscitative efforts may be terminated in patients with traumatic arrest who have no return to spontaneous circulation after 15-30 minutes of resuscitative efforts, including CPR
- 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

AEMT

- ❑ Vascular access and begin fluid therapy
- ❑ **Suspected Tension Pneumothorax:** Evidence of chest trauma + hypotension:
    - Immediate needle decompression of affected side
- ❑ **Traumatic Arrest**
    - Consider bilateral needle decompression based on mechanism of injury

PARAMEDIC

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

AEMT

- ❑ Vascular access and begin fluid therapy
- ❑ **Suspected Tension Pneumothorax:** Evidence of chest trauma + hypotension:
    - Immediate needle decompression of affected side
- ❑ **Traumatic Arrest**
    - Consider bilateral needle decompression based on mechanism of injury

PARAMEDIC

AMPUTATIONS / TOOTH AVULSIONS

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
- ❑ Cardiac monitor, ETCO2, and pulse oximetry monitoring, when available
- ❑ **Treatment Plan**
  - Maintain airway, apply oxygen as needed to maintain SaO2 90-94%.
  - Unless this is an isolated injury, consider spinal motion restriction per the ***Spinal Motion Restriction Guideline.***
  - Treat for pain per the ***Pain Management Guideline***.
  - Monitor closely for signs of shock, especially in amputations above the wrist or ankle.
- ❑ **Amputated Body Parts and/or Tissue**
  - Apply direct pressure to control hemorrhage. A tourniquet is frequently required to control hemorrhage from amputation or near-amputation, when direct pressure is ineffective or impractical.
    - 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.
    - Rinse part(s) with NS.
    - Wrap tissue in sterile gauze moistened with NS.
    - Place tissue into a plastic bag or container.
    - Place bag/container into 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.
- ❑ **Tooth Avulsion**
  - If tooth is out over 30 minutes, broken, or cannot be re-implanted on scene.
    - Handle the tooth by chewing surface only (avoid touching the root).
    - Rinse with water. Do not scrub, dry, or wrap tooth in tissue or cloth.
    - Place tooth in container of (**in order of preference**)
      - Patient's saliva (place in patient's mouth, if patient awake and alert)
      - Alternatively, it may be placed in a container with milk or normal saline
    - If the tooth is out less than 30 min, you may attempt re-Implantation (only **permanent** teeth) on scene (primary or "baby" teeth should not be re-implanted).
      - Do not try to re-implant if more than 2 teeth are involved.
      - The tooth must be cleanly avulsed with the entire root present.
      - Only re-implant if it is one of the front 6 upper or lower teeth.
      - Patient must be conscious and cooperative.
      - Gently insert tooth back into the appropriate location without forcing it. Do not worry about positioning well.
- ❑ **Key Considerations**
  - Consider transportation of extremity amputation patients directly to a trauma center.

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

- ❑ Advanced airway, vascular access and fluid therapy

PARAMEDIC

- ❑ Advanced airway, vascular access and fluid therapy

PARAMEDIC

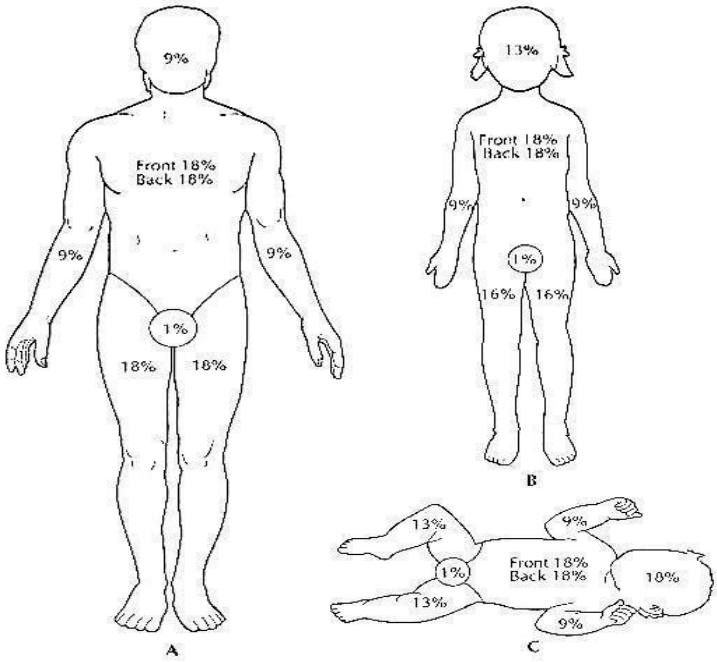
BURNS – THERMAL / ELECTRICAL / LIGHTNING

ALL PROVIDERS / EMT

- ❑ Scene and patient management
  - Thermal Burns
    - Stop the burning process.
    - Do not pull material out of the wound but cut clothing around it.
  - Electrical Burns
    - Safely evacuate patient from electrical source.
    - 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 potential entry and exit wounds for electrical burns – both sites will generally be a full thickness burn site.
- ❑ Cardiac monitor, ETCO2, and pulse oximetry monitoring, when available. Avoid placing monitor attachments over burned skin if possible.
- ❑ **Treatment Plan**
  - Initiate early oxygen therapy with high flow O2.
  - In the unconscious patient, implement spinal motion restriction per the ***Spinal Motion Restriction Guideline***
  - If patient is in shock, fluid resuscitation as per ***Shock and 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 (2nd or 3rd degree) burns with TBSA >10%
    - Circumferential burns
    - Partial or full thickness burns involving face, hands, or genitalia
- ❑ **Cyanide or carbon monoxide (CO) poisoning**
  - Signs: muscular weakness, confusion, agitation, unconsciousness, or profound shock
  - Most common in closed-space fires
  - Apply 100% NRB oxygen
- ❑ **Key Considerations**
  - Electrical Burns are frequently more serious than they appear.

- Consider 12-lead ECG 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), 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.
- Consider Child Abuse as a cause. Circumferential scald burn to hands, feet, buttocks, and genitalia are common burns seen in child abuse (especially in children <5 years old)
- Do not over hydrate patients with IV fluid. See proper fluid rates for burns below.
- 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 totals***



ADULT

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:

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

AEMT

❑ 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 at 500 cc/hr (no bolus)

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

- 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

- ❑ 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)

HEAD INJURY (TRAUMATIC BRAIN INJURY)

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
- ❑ Cardiac monitor, ETCO2, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
  - Maintain airway. Administer oxygen to maintain SaO2 90-94%.
  - Consider spinal motion restrictions per the ***Spinal Motion Restriction Guideline***
  - Elevate head 30 degrees.
  - 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. Utilize airway adjuncts, if needed to ensure adequate chest rise, ventilation, and oxygenation.
    - Target ETCO2: 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 ETCO2: 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 needed to stop severe hemorrhage.
- ❑ **Key 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. Consider physical/chemical restraints if needed to protect patient or personnel.
  - Loss of memory, prolonged confusion or altered mental status associated with trauma may indicate a significant head injury.
  - Avoid hypoxia (SaO2 should be 90-94%).
  - 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 and Fluid Therapy 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.

AEMT | **AEMT**

- ❑ Advanced airway, vascular access, and fluid therapy
- ❑ Check blood pressure every 5-10 minutes.
- ❑ Follow the Traumatic Brain Injury pressure management under the ***Shock and Fluid Therapy Guideline***.
- ❑ **Push Dose Epinephrine** 10mcg as needed to maintain a SBP >100 mmHg after fluid bolus

PARAMEDIC

- ❑ **Persistent hypotension unresponsive to fluids:**
  - **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
  - **Norepinephrine** 0.1–0.5 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a SBP > 100 mmHg.

- ❑ 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
- ❑ If hypotensive patient shows no improvement with initial treatment, may repeat NS 20 ml/kg IV/IO up to a total of 60 ml/kg
- ✆ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) 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 >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

HEMORRHAGE CONTROL, EXTREMITY AND CRUSH INJURIES

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
- ❑ **Treatment Plan**
  - Maintain airway, administer oxygen to maintain SaO2 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.
  - Cover lacerations or puncture wounds on the neck near the great vessels or trachea with an occlusive dressing.
  - **Crush syndrome** should be considered for the following patients:
    - 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.
  - Cover **abdominal eviscerations** with a moist sterile dressing.
    - Do not attempt to replace organs.
  - Cover **extruded eye** or **deflated globe** with a moist sterile dressing and protective eye shield.
    - Do not apply pressure or attempt to replace it in the socket.
    - Cover both eyes, if the patient will tolerate it. This minimizes eye movements.
  - In large, partially attached **skin avulsions**, 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** should be stabilized in place and covered with dry sterile dressings. The exceptions would be:
    - Objects through the cheek where there is the possibility of airway compromise.
    - Objects that would interfere with chest compressions.
- ❑ **Extremity hemorrhage control**:
  - Apply direct pressure to the bleeding site, followed by a pressure dressing
  - If direct pressure/pressure dressing is ineffective or impractical:
    - If the bleeding site is amenable to tourniquet placement, apply a tourniquet to the extremity
      - Tourniquet should be placed 2-3 cm proximal to the wound, not over a joint, and tightened until the bleeding stops *and* the distal pulse is eliminated. If bleeding or distal pulse still present, place a second tourniquet proximal to the first.
      - For thigh wounds, consider placement of two tourniquets, side by side, and tighten sequentially.
      - When a tourniquet is initially placed to stop obvious severe hemorrhage, an attempt may be made to replace it with a pressure dressing after patient is stabilized and bleeding is controlled. The tourniquet should NOT be removed/replaced if:
        - ➢ Amputation or near-amputation

- ➢ Unstable or complex multiple-trauma patients
- ➢ Unstable clinical or tactical situation

- If the bleeding site is NOT amenable to tourniquet placement (for example groin or axillary wounds): tightly pack the wound with gauze followed by 3 minutes of direct pressure, then apply a tight pressure bandage.

❑ **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.

❑ Treatment for pain per the ***Pain Management Guideline***.

❑ **Key Considerations**

- Tourniquets are painful and the conscious patient will likely require pain medication.
- Commercial tourniquets are strongly preferred over improvised tourniquets.

ADULT

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

PARAMEDIC

For patients with severe hemorrhage and hypotension:

❑ **Tranexamic Acid (TXA**) 1g IV bolus, Consider: A second TXA dose (1g IV infusion over 8 hours)

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

AEMT

❑ 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 prior to release from entrapment

❑ Consider hemostatic agents if available

PARAMEDIC

✆ **Tranexamic Acid (TXA)** Please contact medical control for consideration in use in pediatrics

NON-ACCIDENTAL TRAUMA/ABUSE

ALL PROVIDERS

- ❑ Scene and patient management
  - Contact Law Enforcement if someone on scene is a threat to themselves or others.
  - 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 monitor, ETCO2, 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 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. 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.
  - Risk factors include children under age of 5, the elderly, drug or alcohol abuse, and a history of domestic violence.
  - In children under the age of two the most common form of child abuse is **Abusive Head Injury (AHI)**. Mortality of AHI is 25%. For those that live, there is significant morbidity, usually associated with traumatic brain injury.
  - 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, attempt non-pharmacological options to calm a patient. Consider pain management per the ***Pain Management Guideline***.

SNAKE BITES

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
  - Identify and document the type of snake, appearance, location, and distinguishing marks.
  - Obtain an accurate time of injury.
  - Clarify any first aid provided by friends or family prior to arrival.
  - Coral Snakes in North America – "Red on touches Yellow = Poison Fellow, Red on touches Black = Safe with attack".
  - Signs of envenomation include paresthesia, metallic taste, chills, nausea, vomiting, headache, dysphagia, cramps, hypotension, fever, local edema, blebs, and discoloration.
- ❑ Continuous cardiac monitor, ETCO2, 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 the heart.
  - Keep patient calm and movement to a minimum. You may need to treat for pain to help achieve this goal per ***Pain Management Guideline***.
  - Remove items that may constrict swelling tissue, such as rings or bracelets.
- ❑ **Key considerations**
  - Do not start the IV in the affected limb.
  - Do not apply ice to the limb.
  - Do not try to capture the snake.
  - Do not bring a live snake to the ED.
  - Remember that snakes can reflexively envenomate up to 1 hour after death.
  - Pictures of the snake can be helpful.
  - Any snakebite can be dangerous and should be evaluated in the ED.
  - Watch for signs of shock and allergic reaction.

ADULT

AEMT

- ❑ Advanced airway, vascular access, and fluid therapy
- ❑ **Push Dose Epinephrine** 10mcg as needed to maintain a SBP >100 mmHg after fluid bolus

PARAMEDIC

- ❑ **Persistent hypotension unresponsive to fluids:**

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

AEMT

- ❑ Advanced airway, vascular access, and fluid therapy
- ✆ **Push Dose Epinephrine** 1 mcg/kg (Max 50 mcg) as needed to maintain a SBP>70 + (age in years x 2) mmHg after fluid bolus

PARAMEDIC

- ❑ **Persistent hypotension unresponsive to fluids:**

- **Epinephrine** 0.1–0.5 mcg/kg/min (7 to 35 mcg/min in a 70 kg patient) IV/IO infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg
- **Norepinephrine** 0.1–0.5 mcg/kg/min IV/IO infusion for hypoperfusion shock. Titrate up to 30 mcg/min to maintain a 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

SPINAL MOTION RESTRICTION (SMR)

ALL PROVIDERS

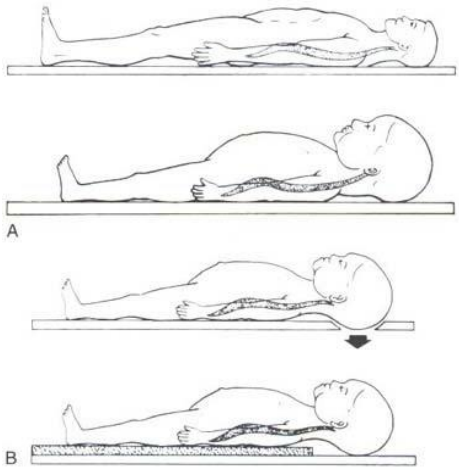
- ❑ Assessment
  - Assess the scene, to determine the risk of injury. Mechanism alone should not determine if a patient requires SMR. However, mechanisms that have been associated with a higher risk of cervical spine injury are the following:
    - Motor vehicle collisions, including automobiles, motorcycles, 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 he/she was found. Initial assessment should focus on determining whether or not a cervical collar needs to be applied.
  - Assess for mental status, neurologic deficits, spinal pain or tenderness, any evidence of intoxication, or other severe/painful injuries
- ❑ **Treatment Plan**
  - 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 need not be placed on the patient, unless the treating medic otherwise 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. For infants and toddlers already strapped in a car seat with a built-in harness, remove the car seat and infant together, leaving the infant 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, it is recommended to remove the face mask followed by manual removal (rather than the use of automated devices) of the helmet, 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.
  - Patients should NOT routinely be transported on long boards, unless the clinical situation specifically warrants long board use. Padded scoop stretchers, vacuum splints, or a secured ambulance cot are all appropriate options for SMR. An example of an indication for long board use may be 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 these rare situations, 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 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 not generally require a spine board.

❑ Pediatric Considerations

- 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 the 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.



ADULT

EMT
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PARAMEDIC

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

EMT
AEMT
PARAMEDIC

Appendix 1

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

Acetaminophen

- Pain Management
- Fever Management
- Altitude Related Illness

Adenosine

- Tachycardia (With a Pulse)

Albuterol

- Allergic reaction/Anaphylaxis
- Drowning or Submersion
- Obstetrical Emergencies
- Respiratory Distress

Amiodarone

- Cardiac Arrest

Aspirin

- Cardiac Chest Pain

Atropine

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

Calcium (Chloride/gluconate)

- Cardiac Arrest
- Toxic Exposure

Diazepam

- Pain Management
- Seizures

Diphenhydramine

- Allergic Reaction/ Anaphylaxis

Dextrose

- Newborn Resuscitation
- Hypoglycemia

Epinephrine

- Cardiac Arrest
- Bradycardia (Symptomatic)
- Newborn Resuscitation
- Allergic Reaction/ Anaphylaxis
- Respiratory Distress

Fentanyl

- Pain Management

Glucagon
- Hypoglycemia

Glucose (Oral)
- Hypoglycemia

Ibuprofen
- Pain Management
- Fever Management
- Altitude Related Illness

Ipratropium
- Respiratory Distress

Ketamine
- Pain management
- Behavioral Emergency

Ketorolac
- Pain Management

Lidocaine
- Cardiac Arrest
- Respiratory Distress

Lorazepam
- Pain Management
- Seizures
- Temperature and Environmental Emergencies
- Behavioral Emergency

Magnesium Sulfate
- Cardiac Arrest
- Obstetrical Emergencies
- Respiratory Distress
- Seizures

Morphine
- Pain Management

Midazolam
- Seizures
- Temperature and Environmental Emergencies
- Behavioral Emergency

Naloxone

- Altered Mental Status
- Opioid/Overdose

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

Norepinephrine
- Vasopressors

Ondansetron
- Nausea / Vomiting
- Altitude Related Illness

Oxytocin
- Obstetrical Emergencies

Sodium Bicarbonate
- Cardiac Arrest
- Opioid/Overdose

Tranexamic Acid (TXA)
- Obstetrical Emergencies
- Hemorrhage Control, Extremity and Crush Injuries