12-LEAD ECG PROCEDURE
ALWAYS USE BODY STANDARD PRECAUTIONS

INDICATION
- Patients with a medical history and/or presenting complaints consistent with Acute Coronary Syndrome (ACS). Indications for the procedure may include one or more of the following:
  - Chest or upper abdominal pain, described as pressure or tightness
  - Nausea or vomiting
  - Diaphoresis
  - Shortness of breath and/or difficulty with ventilation
  - Anxiety, feeling of “doom”
  - Syncope or dizziness
  - Other signs or symptoms suggestive of ACS

PHYSICIAN CONSULT
- If interpretation of ECG is inconclusive and ST segment elevation is present, seek immediate consultation with STEMI Receiving Center (SRC)

EQUIPMENT
- ECG machine and leads

PROCEDURE
- Attach ECG limb leads to arms and legs.
- Attach ECG chest leads as follows:
  - V1: right of sternum, 4th intercostal space
  - V2: left of sternum, 4th intercostal space
  - V3: halfway between V2 and V4
  - V4: left 5th intercostal space, mid-clavicular line
  - V5: horizontal to V4, anterior axillary line
  - V6: horizontal to V5, mid-axillary line
  - V4R- V6R: right 5th intercostal space, mid-clavicular line to mid axillary line (for suspected right ventricular infarction (RVI) and/or physician request). Lead V4R must be obtained whenever ST segment elevation is noted in leads II, III, and AVF

SPECIAL CONSIDERATIONS
- If the 12-lead ECG demonstrates ST elevation and an acute ST elevation Myocardial Infarct is suspected refer to STEMI Policy C 9
- Infarctions may be present with a normal 12-lead ECG. Consider taking a 15-lead ECG.

RELATED POLICIES/PROCEDURES
- Chest Pain/ Acute Coronary Syndrome C 8
- STEMI Policy C 9
ROUTINE MEDICAL CARE (RMC)
BLS

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- To define Routine Medical Care (RMC) in the pre-hospital setting

TREATMENT
- Assess Airway, Breathing and Circulation (ABC)
- Apneic and/or pulseless:
  - Begin CPR in accordance with the standards established by the American Heart Association, including Early Defibrillation
- Patient breathing with pulse present:
  - Administer oxygen per the Airway/Oxygen protocol; using airway adjuncts indicated for signs and symptoms
- Control significant external bleeding using direct pressure. If bleeding remains uncontrolled, apply tourniquet or hemostatic dressing
  * Apply tourniquet proximal to the injury when:
    - Direct pressure does not control bleeding
    - Amputation or near amputation of the limb
    - Severe bleeding from the site which is not accessible
    - Multi-casualty incidents
    - Limb with the tourniquet must remain exposed
  * Apply hemostatic dressing (dressing must be approved by EMS Authority)
- Check vital signs – repeat q 5 min. for emergent patients and q 15 min. for non-emergent patients.
- Obtain pulse oximetry, if available
- Obtain:
  - Chief complaint
  - History of current event
  - Past medical history
  - Medications
  - Allergies
- Perform full secondary patient exam.
- If indicated, apply spinal motion restriction.
- Place patient in position of comfort or in other positions as needed to maintain adequate breathing and/or circulation.
ADULT CARDIAC ARREST GUIDELINE
ALWAYS USE BODY SUBSTANCE ISOLATION STANDARDS PRECAUTIONS

INDICATION
- To provide effective, quality cardiopulmonary resuscitation in a sequential and organized manner

CRITICAL INFORMATION
- Witnessed vs. unwitnessed
- Bystander CPR vs. No Bystander CPR
  - For documentation purposes, inappropriately given CPR = NO CPR

TREATMENT
- If unwitnessed arrest, complete 5 cycles (2 minutes) of CPR before rhythm analysis. If witnessed arrest with effective bystander CPR, immediately attach monitor/defibrillator.
- Compressions
  - Begin compressions at a rate of at least 110 per minute, using a metronome or other similar device that produces regular, metrical feedback at 110 beats per minute.
  - Consider mechanical CPR device if available
  - Compress the chest at least 2 inches and allow for full recoil of chest
  - Change compressors every 2 minutes
  - Minimize interruptions in compressions. If necessary to interrupt, limit to 10 seconds or less
  - Do not stop compressions while defibrillator is charging
  - Resume compressions immediately after any shock
- Monitor/Defibrillator
  - Priority of second rescuer is to apply pads while compressions are in progress
  - Determine rhythm and shock if indicated
  - Follow specific treatment guideline based on rhythm
- Basic Airway Management
  - During the first 5 minutes of resuscitation BLS airway management is preferred
  - Open airway and provide 2 ventilations after every 30 compressions
  - Ventilation should be about one second each- enough to cause visible chest rise. Avoid excessive ventilation.
  - Use two-person BLS Airway management (one holding mask and one squeezing bag) whenever possible
- Establish IV/IO Access (IO preferred)
- Advanced Airway Management
  - Placement of advanced airway is not a priority during the first 5 minutes of resuscitation unless no ventilation is occurring with basic maneuvers
  - King Airway is the preferred device if an advanced airway is required.
  - Laryngoscopy for endotrachael tube placement must occur with CPR in progress. Compressions should not be interrupted for more than 10 seconds for advancement of tube through the cords
  - AVOID EXCESSIVE VENTILATION – provide no more than 8-10 ventilations per minute
  - Maintain O2 saturation level of \( >94\% \text{ and } <100\% \) 94%-99%.
  - Continuous monitoring of End-Tidal CO2 to monitor effectiveness of CPR and advanced airway placement.
- Treatment on Scene
  - Movement of patient during CPR may be detrimental to patient outcome.
provide resuscitation on scene until ROSC, or patient meets Determination of Death criteria, or transport is indicated. Paramedic discretion to transport patients receiving CPR may be warranted in certain situations (refractory VF, unsafe scene conditions, hypothermic, etc.).

- Regardless of the above, transportation is warranted in the following situations: refractory VF, unsafe scene conditions, hypothermia as a primary cause of arrest (<95F/35C), pediatric patients.
  - Cautions re. Resuscitation if <32: Severe hypothermia causes cardiac instability. Physical stimuli (includes jostling, exercise, chest compression, and endotracheal intubation) can cause ventricular fibrillation in a cold heart that is functioning effectively.

- Manual CPR is not advised in the back of a moving ambulance. If transporting a patient needing CPR, consider using mechanical CPR if available.

- To assure ROSC continues, remain on scene for 5-10’ to assure ROSC, and then transport to a STEMI Receiving Center.

**RELATED POLICIES/ PROCEDURES**

- Determination of Death  ATG6
- Determination of Death  BLS5
- King Airway Procedure  ALS14
- Ventricular Fibrillation / Pulseless Ventricular Tachycardia  C1
- PEA  C2
- Asystole  C3
- Return of Spontaneous Circulation  C10
CEREBROVASCULAR ACCIDENT (STROKE)
ALWAYS USE STANDARD PRECAUTIONS

INDICATION
- Sudden onset of weakness/paralysis, speech, vision or gait disturbance

TREATMENT/PROCEDURE
- ALS RMC
  - Routine administration of supplemental oxygen is not indicated if saturation is >93%
  - Treat hypoglycemia as indicated
  - Consider 12-lead EKG if suspicion of cardiac ischemia or any dysrhythmias
  - IV access required if meets Early Stroke Notification criteria
  - Recommended positioning of 20-30% elevation of head of bed or left lateral decubitus
- Assess for criteria meeting Early Stroke Notification (Must Meet All Criteria):
  - Positive finding per the Cincinnati Prehospital Stroke Scale (CPSS) or the Los Angeles Motor Scale (LAMS) score
  - Last known well < 4 hours
  - Symptoms NOT known to be due to drug/alcohol intoxication or hypoglycemia
- If patient meets criteria listed above, initiate an Early Stroke Notification (include Radio ID of patient) and rapidly transport to patient’s preferred Primary Stroke Center (PSC), as long as the estimated transport time is not > 15 minutes longer than the closest PSC.
  - Preferred PSC: patient’s preference or PSC with patient’s medical records
  - No preferred PSC: transport to the closest PSC
- If high suspicion of rapidly progressive intracranial bleed (sudden, witnessed onset of coma or rapidly deteriorating GCS especially in setting of severe headache) transport to Marin General Hospital

CONSIDERATIONS
- Stroke Mimics include intoxication, hypoglycemia, seizure, infection, complex migraine and spinal injury/disruption
- LAMS correlates with stroke severity and a score ≥4 is predictive of a large vessel occlusion stroke that may be eligible for clot retrieval therapy. It is not predictive of posterior circulation strokes (~ 10% of all strokes).
- Stroke Tips: *GCS < 10 less likely to be associated with acute stroke *Acute onset of dizziness and/or gait instability, especially in a patient without clear signs of vertigo may be represent a posterior circulation stroke.
- Blood Glucose <50 or > 400 are relative contraindications for t-PA administration and routinely be normalized prior to t-PA treatment

DOCUMENTATION- ESSENTIAL ELEMENTS
- Criteria for Early Stroke Notification
- Choose CVA as Primary Impression
- Name and contact information for patient family member/decision maker
- Documentation of CPSS and LAMS results and hospital notification
- Last known well (document in military time)
- Blood glucose level
- GCS
- History of intracranial hemorrhage
- Serious head injury within 2 months
- Taking anticoagulant medications (e.g. Warfarin/ Coumadin, Pradaxa, Xarelto, Eliquis)
- Improving neurological deficit

**RELATED POLICIES/ PROCEDURES**
- Destination Guidelines GPC 4
- Prehospital / Hospital Contact Policy 7001
- Ambulance Diversion Policy 5400
- Coma/ALOC N1
Cincinnati Pre-Hospital Stroke Scale (CPSS)

*Facial Droop* (the patient shows teeth or smiles)
- **Normal:** both sides of the face move equally
- **Abnormal:** Right side of the face does not move as well as the left
- **Abnormal:** Left side of the face does not move as well as the right

*Arm Drift* (the patient closes their eyes and extends both arms straight out for 10 seconds)
- **Normal:** both arms move the same, or both arms do not move at all
- **Abnormal:** Right arm either does not move, or drifts down compared to the left
- **Abnormal:** Left arm either does not move, or drifts down compared to the right

*Speech* (the patient repeats “The sky is blue in Cincinnati.” or other sentence)
- **Normal:** the patient says the correct words with no slurring of words
- **Abnormal:** the patient slurs words, says the wrong words, or is unable to speak

### The Los Angeles Motor Score (Total Score)

<table>
<thead>
<tr>
<th>Finding</th>
<th>Calculate Score</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facial Droop</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>0</td>
<td><strong>Absent:</strong> Patient has no facial droop</td>
</tr>
<tr>
<td>Present</td>
<td>1</td>
<td><strong>Present:</strong> Facial asymmetry</td>
</tr>
<tr>
<td><strong>Arm Weakness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absent</td>
<td>0</td>
<td><strong>Absent:</strong> No weakness, both arms move symmetrically</td>
</tr>
<tr>
<td>Drifts Down</td>
<td>1</td>
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<tr>
<td>Falls Rapidly</td>
<td>2</td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
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**LAMS Score Analysis**

A LAMS assessment score of ≥ 4 indicates a high likelihood of a large vessel occlusion stroke.
CEREBROVASCULAR ACCIDENT (STROKE)  
ALWAYS USE STANDARD PRECAUTIONS

INDICATION
- Sudden onset of weakness/paralysis, speech, vision or gait disturbance

TREATMENT/PROCEDURE
- ALS RMC

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- Improving neurological deficit

RELATED POLICIES/ PROCEDURES
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- Prehospital / Hospital Contact Policy 7001
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SUPPLEMENTS

Cincinnati Pre-Hospital Stroke Scale (CPSS)

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The Los Angeles Motor Score (Total Score)

**LAMS SCORING**

When the Cincinnati Stroke Scale is abnormal and a LAMS assessment is completed, calculate the LAMS score to determine the likelihood of a large vessel occlusion stroke.

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**LAMS SCORE ANALYSIS**

A LAMS assessment score of ≥ 4 indicates a high likelihood of a large vessel occlusion stroke.

t-PA Checklist
☐ Name: ____________________________
☐ Last seen normal time: ____________________________
☐ Name of Family Contact: ____________________________
☐ Best Contact number: ____________________________
☐ Glucose (fingerstick): ____________________________
☐ Medications - any evidence that patient on any anticoagulant? (circle)
   Warfarin (Coumadin)  Dabigatran (Pradaxa)
   Heparin SQ  Fondaparinux (Arixtra)
   Enoxaparin (Lovenox)  Aspirin/Plavix
☐ Prenotify with ID
PEDIATRIC PULSELESS ARREST

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- Pulseless, chaotic, disorganized electrical rhythm (Ventricular Fibrillation/ VF)
- Pulseless, organized “wide complex” rhythm, rate > 150/ min (Ventricular Tachycardia/ VT)
- Electrical activity other than VF or VT that does not produce a palpable pulse (Asystole, Pulseless Electrical Activity/ PEA)

CRITICAL INFORMATION
- Treat according to length based Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Monophasic and biphasic doses are the same
- Witnessed or unwitnessed
- Bystander CPR
- If arrest witnessed, time without CPR

TREATMENT
- CPR for 2 minutes then treat according to length based color-coded tape or see below
- ALS RMC

- VF/ VT:
  - Defibrillate: Manual - 2 J/kg; if unavailable use AED with dose attenuator; CPR for 2 minutes
  - Defibrillate: Manual - 4 J/kg; if unavailable use AED with dose attenuator; CPR for 2 minutes
  - Epinephrine IV/IO (1:10,000) 0.01mg/kg; repeat q 3-5 min.
  - CPR for 2 minutes
  - Defibrillate: Manual - 4 J/ kg; if unavailable use AED with dose attenuator; CPR for 2 minutes
  - Amiodarone 5 mg/kg IVP/IO (max. dose 300 mg); may repeat up to two times for refractory rhythm

- Asystole/ PEA:
  - Epinephrine IV/ IO (1:10,000) 0.01 mg/kg; repeat q 3-5 min.
  - Give 5 cycles of CPR and reassess rhythm

SPECIAL CONSIDERATION
- If unable to access IV/IO, Epinephrine (1:1,000) ET 0.1mg/ kg; repeat q 3-5 min
- If pediatric dose attenuator is not available, use a standard AED
- Consider and treat possible contributing factors:

<table>
<thead>
<tr>
<th>Contributing Factors</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Hypovolemia</td>
<td>Toxins (overdoses)</td>
</tr>
<tr>
<td>Hypoxemia</td>
<td>Tamponade, cardiac</td>
</tr>
<tr>
<td>Hydrogen ion (acidosis)</td>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>Hypo/Hyperkalemia</td>
<td>Thrombosis (coronary / pulmonary)</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Trauma</td>
</tr>
<tr>
<td>Hypothermia</td>
<td></td>
</tr>
</tbody>
</table>
NEWBORN RESUSCITATION

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- Prehospital delivery of a newborn

CRITICAL INFORMATION
- Assess for term gestation, crying or breathing, heart rate, and muscle tone.
- Use length-based color-coded resuscitation tape, apply corresponding wrist band, and treat according to tape recommendations.
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.

TREATMENT
- Provide routine newborn care if no abnormal findings on initial exam (see assessment above).
  - Provide warmth
  - Clear airway if necessary
  - Dry / stimulate
- If weak / absent respiratory effort or decreased / absent muscle tone:
  - Provide warmth
  - Open airway
  - Stimulate
- Reassess heart rate and respiratory effort
  - If HR > 100/MIN, breathing is unlabored, and patient’s color improves, continue supportive care
  - If HR > 100/MIN and breathing is labored and color does not improve, provide supplemental O2
  - If HR < 100/MIN perform BVM at 40-60 per minute; consider ETT
  - If HR remains < 60/MIN perform BVM with chest compressions
    - 90 compressions / 30 ventilations per minute
  - If HR < 60 continues, perform endotracheal intubation and administer Epinephrine 1:10,000 0.01mg/kg ET/IO/IV (may give up to 0.1mg/kg via ET). Repeat every 3-5 min
- IV/IO if not previously initiated
- Administer fluid bolus of 10 ml/kg IV/IO
- Assess for hypoglycemia and treat as needed
- Continuous assessment of heart rate and respiratory effort en route

SPECIAL CONSIDERATIONS
- Epinephrine administration is indicated for asystole or spontaneous heart rate less than 60 beats per minute despite adequate ventilation with 100% oxygen and chest compressions after 30 seconds. Epinephrine by ETT is the fastest route and minimizes delay in resuscitation.
- Narcan is contraindicated in neonatal resuscitation.
- Clamp and cut cord after one minute.
- Peripheral cyanosis is normal.

DOCUMENTATION- ESSENTIAL ELEMENTS
- Presence of meconium
- APGAR score at 1 and 5 minutes

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate (bpm)</td>
<td>Absent</td>
<td>Slow (&lt;100)</td>
<td>≥100</td>
</tr>
<tr>
<td>Respirations</td>
<td>Absent</td>
<td>Slow, irregular</td>
<td>Good, crying</td>
</tr>
<tr>
<td>Muscle tone</td>
<td>Limp</td>
<td>Some flexion</td>
<td>Active motion</td>
</tr>
<tr>
<td>Reflex irritability</td>
<td>No response</td>
<td>Grimace</td>
<td>Cough, sneeze, cry</td>
</tr>
<tr>
<td>Color</td>
<td>Blue or pale</td>
<td>Pink body with blue extremities</td>
<td>Completely pink</td>
</tr>
</tbody>
</table>
PEDIATRIC RESPIRATORY DISTRESS

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION

- Patient exhibits any of the following:
  - Wheezing
  - Stridor
  - Grunting
  - Nasal flaring
  - Apnea

CRITICAL INFORMATION

- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years

TREATMENT

- ALS RMC
- Position of comfort to maintain airway
- Allow parent to administer oxygen if possible
- Upper Airway/ Stridor:
  - Mild to moderate respiratory distress: 3ml NS via HHN
  - Moderate to severe respiratory distress: Epinephrine 1:1,000 5 mg in 5 ml via nebulizer
- Lower Airway Obstruction/ Wheezing:
  - Albuterol 2.5 mg in 3 ml NS via HHN, mask, or bag-valve-mask; MR x 1 and
  - Ipratropium 500 mcg in 2.5 ml NS via HHN or bag-valve-mask
  - If response inadequate, Epinephrine 1:1,000 (0.01 mg/kg) IM, max. single dose 0.3 mg; maximum dose = 0.6 mg.
- Foreign Body Obstruction:
  - Attempt to clear airway:
    - < 1 year: 5 back blows and 5 chest thrusts
    - > 1 year: 5 abdominal thrusts
  - Visualize larynx and remove foreign body with Magill forceps
- Respiratory failure/ apnea/ complete obstruction.
  - Attempt positive pressure ventilation via bag-valve-mask, if unable to ventilate, attempt intubation

SPECIAL CONSIDERATIONS

- Assess key history factors: recent hospitalizations, asthma, allergies, croup, and medication usage
**PEDIATRIC BRADYCARDIA**

**ALWAYS USE** BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

**INDICATION**
- HR< 60 causing cardio-respiratory compromise

**CRITICAL INFORMATION**
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length-based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years
- History of exposure to substances or medications

**TREATMENT**
- ALS RMC
- 12-lead ECG
- Obtain IV/IO access
- If responsive and no signs of shock
  - Monitor and transport
- If shock present:
  - Chest compressions if HR < 60 and patient is < 8 years with poor perfusion:
  - **Epinephrine** 1:10,000 IV/IO: 0.01 mg/kg (0.1 ml/kg); MR q 3-5 min.
  - If first degree block or Mobitz type I, **Atropine** 0.02 mg/kg IV/IO (max single dose: 0.5 mg; minimum single dose: 0.1 mg); MR x 1
  - Consider endotracheal intubation
  - Consider cardiac pacing if no response to above treatment.

**SPECIAL CONSIDERATIONS**
- Consider and treat possible contributing factors:
  - Hypovolemia
  - Hypoxemia
  - Hydrogen ion (acidosis)
  - Hypo/Hyperkalemia
  - Hypoglycemia
  - Hypothermia
  - Toxins (overdoses)
  - Tamponade, cardiac
  - Tension pneumothorax
  - Thrombosis (coronary / pulmonary)
  - Trauma

**RELATED POLICIES/ PROCEDURES**
- External Cardiac Pacing Procedure ALS PR 11
- Pediatric Dosing Guide P18 A
PEDIATRIC TACHYCARDIA
POOR PERFUSION

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- Rapid heart rate (HR > 220 infant: HR > 180 child) with pulse and poor perfusion

 PHYSICIAN CONSULT
- Amiodarone

CRITICAL INFORMATION
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years
- Monophasic and biphasic doses are the same

TREATMENT
- ALS RMC
- 12-lead EKG
- If normal QRS ≤ 0.09 seconds; Probable Sinus Tachycardia or Supraventricular Tachycardia:
  - Consider vagal maneuvers, but do not delay other treatments
  - If vascular access readily available, Adenosine 0.1mg/kg IV/IO; max first dose 6 mg. MR X 1: (double the dose), maximum dose 12 mg. Follow each dose with rapid 10 ml flush.
  - Premedicate with Midazolam 0.05 mg/kg IV/IO (maximum 1 mg per dose; Maximum total dose = 5 mg).
  - Do not delay cardioversion if patient unstable.
  - Cardiovert: 0.5-1J/kg; if not effective, increase to 2 J/kg
- Wide QRS ≥ 0.09 seconds; Probable Ventricular Tachycardia:
  - Cardiovert (see above)
  - Amiodarone if no response to cardioversion: 5 mg/kg IV over 20-60 minutes

SPECIAL CONSIDERATION
- Consider and treat possible contributing factors:

<table>
<thead>
<tr>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypovolemia</td>
</tr>
<tr>
<td>Hypoxemia</td>
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<tr>
<td>Hydrogen ion (acidosis)</td>
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<tr>
<td>Hypo/Hyperkalemia</td>
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<td>Hypoglycemia</td>
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<tr>
<td>Hypothermia</td>
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<tr>
<td>Toxins (overdoses)</td>
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<tr>
<td>Tamponade, cardiac</td>
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<tr>
<td>Tension pneumothorax</td>
</tr>
<tr>
<td>Thrombosis (coronary / pulmonary)</td>
</tr>
<tr>
<td>Pain</td>
</tr>
<tr>
<td>Trauma</td>
</tr>
</tbody>
</table>
PEDIATRIC SHOCK

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- Inadequate organ and tissue perfusion to meet metabolic demands

CRITICAL INFORMATION
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length-based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years

TREATMENT
- ALS RMC
- IV/ IO X 2; Use length-based color-coded resuscitation tape to determine fluid boluses; repeat bolus as needed
- Check blood glucose and treat if <60 mg/dl (<40 mg/dl neonate):
  - Neonate = D10W 2 ml/kg IV/IO
  - Neonate—Infant - 2 years = D25W 2 ml/kg IV/IO or D10W 4ml/kg
  - ≥2 years = D50W 1 ml/kg IV/IO
- If unable to establish vascular access; Glucagon .03 mg/kg (max = 1 mg) IM; MR x 2 q 15 minute intervals
- For symptoms of anaphylaxis, follow Allergic Reaction Policy P 8

SPECIAL CONSIDERATION
- Fluid resuscitation may require 40-60 ml/kg or more
PEDIATRIC ALLERGIC REACTION

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- Exposure to allergens causing airway, breathing and/or circulatory impairment

CRITICAL INFORMATION
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length-based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years
- Exposure to common allergens (stings, drugs, nuts, seafood, meds), prior allergic reactions
- Presence of respiratory symptoms (wheezing, stridor)

TREATMENT
- ALS RMC
- Mild (hives, rash)
  - Benadryl 1mg/kg IM (MR in 10 minutes; max. dose 50 mg)
- Moderate / Severe
  - Epinephrine IM (1:1000) 0.01mg/kg (MR in 15 minutes); max. dose 0.6 mg
  - Benadryl 1mg/kg IM/IV/IO (MR in 10 minutes; max. dose 50 mg)
  - Albuterol 2.5 mg/3 ml NS HHN if bronchospasms present; MR X1 if no improvement
  - If hypotensive, fluid challenge NS 20 ml/kg IV/IO, MR
  - If no palpable pulse or BP; Epinephrine IV/IO (1:10,000) 0.01mg/kg; MR q 3-5 minutes

SPECIAL CONSIDERATION
- Glucagon 0.03 mg/kg IM for patients on beta blockers to reverse blockage

DOCUMENTATION- ESSENTIAL ELEMENTS
- Allergen if known
PEDIATRIC SEIZURES

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION

- Recurring or continuous generalized seizures with ALOC

CRITICAL INFORMATION

- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length-based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years
- Evaluate for and treat hypoglycemia, hypoxia, narcotic overdose, trauma, fever, etc. prior to administering anti-seizure medications

TREATMENT

- ALS RMC
- Vascular access for prolonged seizures
- Check blood glucose and treat if <60 mg/dl (<40 mg/dl neonate):
  - Neonate = D10W 2 ml/kg IV/IO
  - < 2 years = D25W 2 ml/kg IV/IO or D10W 4 ml/kg IV/IO
  - ≥ 2 years = D50W 1 ml/kg IV/IO
  - If unable to establish vascular access; Glucagon 0.03 mg/kg (max = 1 mg) IM; MR x 2 q 15 minute intervals
- Midazolam (Versed)
  - IV/IO: 0.05 mg/kg (maximum 1 mg per dose). MR q 3 minutes until seizure stops and/or total dose of 5 mg is reached.
  - IN: 0.2 mg/kg (split dose equally per nostril); Maximum dose = 5 mg
  - IM: 0.1 mg/kg; MR x 1 in 10 minutes if still seizing.

DOCUMENTATION- ESSENTIAL ELEMENTS

- Number, description, and duration of seizures

RELATED POLICIES/ PROCEDURES

- Intranasal Medications Midazolam (Versed) & Narcan ALS PR 7
- Pediatric Dosing Guide P18A
PEDIATRIC ALTERED LEVEL OF CONSCIOUSNESS (ALOC)

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- Abnormal neurologic state where child is less alert and interactive than is age appropriate

CRITICAL INFORMATION
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length-based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years
- Narcan is contraindicated with neonatal resuscitation

TREATMENT
- ALS RMC
- Check blood glucose and treat if < 60 mg/dl (neonate < 40 mg/dl):
  - Neonate = D10W 2 ml/kg IV/IO
  - Infant - 2 years = D25W 2 ml/kg IV/IO or D10W 4ml/kg IV/IO
  - >2 years = D50W 1 ml/kg IV/IO
- If unable to establish vascular access; Glucagon .03 mg/kg (max = 1 mg) IM; MR x 2 q 15 minute intervals
- Narcan 0.1 mg/kg IM/IV/IO/IN. MR Q 5 minutes up to 2 mg if no improvement in ALOC and strong suspicion of opiate exposure

RELATED POLICIES/PROCEDURES
- Intranasal Medications Midazolam (Versed) and Narcan ALS PR 7
- Pediatric Dosing Guide P18A
**PEDIATRIC TOXIC EXPOSURES**

**ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS**

**INDICATION**
- Probable ingestion and/or exposure to one or more toxic substances, including alcohol and medications

**PHYSICIAN CONSULT**
- Calcium Channel Blocker, Beta-Blockers, and Tricyclic overdoses

**CRITICAL INFORMATION**
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years
- Bring identifying substance containers to hospital when possible / appropriate

**TREATMENT**
- ALS RMC
- Fluid bolus NS 20 ml/kg IV/IO as indicated
- If suspected opiate overdose in patient > four weeks, administer Narcan 0.1 mg/kg IV/IO/IM/IN prior to advanced airway
  - Hydrocarbons or Petroleum Distillates
    - Do not induce vomiting
    - Transport immediately
  - Calcium Channel Blockers / Tricyclics / Beta-Blockers
    - Transport immediately
    - If within one hour of ingestion Administer Activated Charcoal 1 gm/kg PO, max. of 50 gms, if airway is protected
  - * Beta Blocker OD: Glucagon 0.03 mg/kg IM
  - Physician consultation for additional treatments (i.e., Calcium Chloride, Sodium Bicarb)
  - Caustics/Corrosives
    - Do not induce vomiting
    - Consider dilution with no more than 1-2 glasses of water or milk if NO respiratory compromise or change in mental status
  - Insecticides (organophosphates, carbonates; cause cholinergic crisis characterized by bradycardia, increased salivation, lacrimation, sweating, muscle fasciculation, abdominal cramping, pinpoint pupils, incoherence or coma):
    - Decontaminate patient
    - Atropine 0.05 mg/kg IV/IO slowly every 5-10 minutes until symptoms resolve.
    - If seizures, Midazolam (Versed):
      - IV / IO: 0.05 mg/kg (maximum 1 mg per dose). May repeat every 3 minutes until seizure stops and/or total dose of 5 mg is reached.
      - IM: 0.1 mg/kg; May repeat x 1 in 10 minutes if still seizing.
      - IN: 0.2 mg/kg (split dose in half for each nostril). Maximum dose = 5 mg
  - Phenothiazine Reactions
    - Benadryl 1 mg/kg IM/IV/IO to max. of 50 mg
    - Other Non-Caustic Drugs, awake and alert
If within one hour of ingestion: **Activated Charcoal** 1 gm/kg PO, max. of 50 gms

**SPECIAL CONSIDERATION**
- Early contact with Poison Control Center

**DOCUMENTATION - ESSENTIAL ELEMENTS**
- Toxic substance identification
- Approximate time of exposure / ingestion

**RELATED POLICIES/ PROCEDURES**
- Intranasal Medications Midazolam (Versed) and Narcan ALS PR 7
- Pediatric Seizures P 9
- Pediatric Dosing Guide P18A
PEDIATRIC BURNS

ALWAYS USE **BODY SUBSTANCE ISOLATION STANDARD** PRECAUTIONS

**INDICATION**
- Second or third degree burns (i.e., caustic material, electricity or fire) involving 10% or more of body surface area or those associated with respiratory involvement

**CRITICAL INFORMATION**
- Treat according to length based color-coded resuscitation tape. Apply corresponding wrist band.
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; Adolescent = >14 years
- Consider early intubation for severe facial burns
- Burns with trauma mechanism are to be transported according to the Marin County Trauma Triage Tool

**TREATMENT**
- ALS RMC
- Thermal/Electrical:
  - Remove patient to safe area
  - Eliminate source and stop the burning process (water may be used in the first few minutes to stop the burning process)
  - Remove all clothing/ jewelry
- Chemical:
  - Brush away any dry chemicals
  - Attempt to identify chemical; flush affected area with copious amounts of water unless contraindicated
  - Support ventilation with high flow oxygen
  - If wheezing consider bronchodilator therapy - **Albuterol** 2.5 mg HHN; MR x 1
    - Re-evaluate airway frequently
  - Expose affected area and apply clean dry sheet
  - Keep patient warm to avoid hypothermia
  - Fluid bolus 20 ml/kg **NS** IV/IO
  - Pain management as indicated
  - Transport by ground. If there is respiratory involvement, transport to the time closest ED by air or ground.

**SPECIAL CONSIDERATION**
- Avoid hypothermia, do not use ice or wet dressings, and keep patient warm
- IV/IO required if BSA >10%

**DOCUMENTATION- ESSENTIAL ELEMENTS**
- Estimated percentage of BSA affected

**RELATED POLICIES/ PROCEDURES**
- Pediatric Pain Management P15
- Pediatric Shock P7
- **Pediatric Dosing Guide P18A**
PEDIATRIC TRAUMA

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION

- Suspected or apparent injuries which meet conditions listed on the Marin County Trauma Triage Tool

CRITICAL INFORMATION

- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years; adolescent = >14 years
- Rapid transport to the appropriate trauma receiving facility is of paramount importance and must be taken into account in the field management of pediatric trauma patients.

TREATMENT

- ALS RMC
- Early trauma center notification
- Secure airway, maintaining C-spine precautions as per policy
- IV/ IO NS bolus 20 ml/kg; MR X 1
- Pain management as appropriate

SPECIAL CONSIDERATION

- If injury may have resulted from abuse, neglect, assaults, and/or other crimes, refer to Suspected Child Elder and/or Dependent Adult Abuse Policy for reporting.

RELATED POLICIES/ PROCEDURES

- Destination Guidelines GPC 4
- Trauma Triage and Destination Guidelines, 4613
- Suspected Child Elder and/ or Dependent Adult Abuse GPC 9
- Spinal Immobilization GPC 13
- Pediatric Pain Management P15
- Pediatric Dosing Guide P 18A
PEDIATRIC APPARENT LIFE-THREATENING EVENT (ALTE)

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- A frightening episode to the observer characterized by some combination of:
  - Apnea (central or obstructive)
  - Color change (cyanosis, pallor, erythema)
  - Marked change in muscle tone
  - Unexplained choking or gagging

PHYSICIAN CONSULT
- Parent/Designated Decision Maker (DDM) refuses medical care and/or transport

CRITICAL INFORMATION
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length based color-coded resuscitation tape. Apply corresponding wrist band.
- Neonate = birth to four weeks; infant = four weeks to 1 year; child = 1-14 years;
- adolescent = >14 years
- Although ALTE usually occurs in patients < 12 months, any patient under 24 months who experiences any of the above indications should be considered
- Medical history: cardiac arrhythmias/anomalies, child abuse, meningitis, near SIDS, seizures, sepsis, toxic exposure, trauma

TREATMENT
- ALS RMC
- Check blood glucose and treat if < 60 mg/dl (< 40 mg/dl if neonate):
  - Neonate = D10W 2 ml/kg IV/IO
  - < 2 years = D25W 2 ml/kg IV/IO or D10W 4 ml/kg IV/IO
  - ≥ 2 years = D50W 1 ml/kg IV/IO
  - If unable to establish vascular access; Glucagon .03 mg/kg (max = 1 mg) IM; MR x 2 q 15 minute intervals

SPECIAL CONSIDERATION
- Most ALTE patients have a normal physical exam
- Assume parental history is real. Encourage transport no matter how well the patient might appear.

DOCUMENTATION- ESSENTIAL ELEMENTS
- Severity, nature and duration of the episode
- General appearance of the patient, skin color, extent of interaction with the environment
- Evidence of trauma
RELATED POLICIES/ PROCEDURES

- Suspected Child/Dependent Adult/ Elder Abuse GPC 9
- Pediatric Dosing Guide P 18A
PEDIATRIC PAIN MANAGEMENT

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- To provide analgesia for pediatric patients (6 months to 14 years or up to 45 kg), especially if anticipated extrication, movement, or transportation would exacerbate the patient’s level of pain

**PHYSICIAN CONSULT**
- Patients less than 6 months of age
- Patients with head, chest, or abdominal trauma; decreased respirations; ALOC (GCS < 15)
- Additional doses of narcotic after initial doses administered

CRITICAL INFORMATION
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length-based color-coded resuscitation tape. Apply corresponding wrist band.
- Origin of pain (examples: isolated extremity trauma, chronic medical condition, burns, abdominal pain, multi-system trauma)
- Mechanism of injury
- Approximate time of onset
- Complaints or obvious signs of discomfort
- Use Visual Analog Scale (0-10) or Wong/Baker Faces Pain Rating Scale (see Appendix A). Express results as a fraction (i.e. 2/10 or 7/10).

TREATMENT
- ALS RMC
- Morphine Sulfate 0.1mg/kg IV/IO/IM; MR x 2 in 15 minutes following IV/IO administration, or in 30 minutes following IM administration.
- Physician consult for additional doses
- Have Narcan available

DOCUMENTATION- ESSENTIAL ELEMENTS
- Initial and post treatment pain score, expressed in a measurable form (i.e. 7/10)
- Interventions used for pain management (i.e. ice pack, splint, Morphine Sulfate)
- Reassessments made after interventions
- Initial and post treatment vital signs (including GCS in patients with ALOC)
- Physician consult if required
PEDIATRIC SEXUAL ASSAULT
ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION
- Patients under 14 years of age with complaints consistent with sexual assault

CRITICAL INFORMATION
- Preserve possible evidence and advise patient not to clean, bathe or change clothes until after examination by hospital personnel
- Notify police and dispatch of nature of call
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.
- Treat according to length based color-coded resuscitation tape. Apply corresponding wrist band.

TREATMENT
- BLS/ ALS RMC
- Calm/ reassure patient
- Assign responder of same sex as patient if possible
- Treat medical conditions/ traumatic injuries per protocol
- If no medical conditions/ traumatic injuries are apparent and assault occurred within 72 hours of report:
  - Law Enforcement will take the victim to Children’s Hospital Oakland (CHO) for a medical evidentiary examination and should call the Emergency Department at CHO (510) 428-3240 and ask for the ED Social Worker on call
- If no medical conditions / traumatic injuries and the assault occurred > 72 hours of the report
  - Law Enforcement will make a decision of whether or not to proceed with the forensic medical examination
  - If patient/ Designated Decision Maker (DDM) refuses transport, instruct patient/DDM not to shower and advise of alternative care/ transport options per AMA or RAS Policy

DOCUMENTATION- ESSENTIAL ELEMENTS
- Date and time of alleged assault
- Details of injuries noted
- Law Enforcement actions and determination of destination
- Patient’s destination

RELATED POLICIES/ PROCEDURES
- AMA Policy GPC 2
- RAS Policy GPC 3
- Destination Guidelines GPC 4
- Pediatric Dosing Guide P. 18A
PEDIATRIC INTRAOSSEOUS INFUSION

ALWAYS USE BODY SUBSTANCE ISOLATION STANDARD PRECAUTIONS

INDICATION

- Immediate delivery of medications or fluids is needed for patient in profound hypovolemia, cardiac arrest, extremis from other cause and IV cannot be established in 90 seconds
- Measure with color-coded resuscitation tape and treat according to the Pediatric Dosing Guide (P18A). Apply corresponding wrist band.

CONTRAINDICATIONS

- Absolute contraindications:
  - Recent fracture of involved bone (less than 6 weeks)
  - Vascular disruption proximal to insertion site
  - Inability to locate landmarks
- Relative contraindications:
  - Infection or burn overlying the site

CRITICAL INFORMATION

- Age and/or weight of patient will determine correct device
- Limit attempts at IO access at scene to no more than 2

SPECIAL CONSIDERATION

- Pressure bags for optimal flow of IO infusions

DOCUMENTATION- ESSENTIAL ELEMENTS

- Number of attempts to establish peripheral IV if applicable
- Number of attempts to establish IO
- Insertion site
- Patency at time of transfer of care
## PEDIATRIC MEDICATIONS

**AUTHORIZED/ STANDARD INITIAL DOSE**

<table>
<thead>
<tr>
<th>DRUG</th>
<th>CONCENTRATION</th>
<th>STANDARD DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated Charcoal</td>
<td>25 GM/ bottle</td>
<td>1 gm/ kg PO; not to exceed 50 gm.</td>
</tr>
</tbody>
</table>
| Adenosine (Adenocard)        | 6 mg/ 2 ml             | *Tachycardia Poor Perfusion:* 0.1mg/kg; max. first dose 6mg. MR x 1 (double the dose); max. dose 12mg. (Rapid IV/IO push, each dose followed by 5 ml NS flush).  
  *Tachycardia Adequate Perfusion:* Dose as above after physician consult |
| Albuterol                    | 2.5 mg/ 3 ml NS        | 2.5 mg/ 3ml NS                                         |
| Amiodarone                   | 150 mg/ 3 ml           | *Pulseless Arrest:* 5 mg/ kg IV/ IO followed by or diluted in 20-30 ml NS. Maximum single dose 300 mg.  
  *Tachycardia with poor perfusion:* 5mg/kg IV/IO over 20-60 min. |
| Atropine                     | 1 mg/ 10 ml            | *Bradycardia:* 0.02 mg/kg IV/ IO (minimum dose 0.1 mg.; single max. dose 0.5mg). MR X 1.  
  *Organophosphate Poisoning:* 0.05 mg/kg IV/IO; MR q 5-10 min. max. dose 4mg or until relief of symptoms |
| Dextrose 10%                 | D10%                   | *ALOC (Neonate):* 2 ml/ kg IV/IO  
  *ALOC (<2 years):* 4ml/ kg IV/IO |
| Dextrose 25%                 | 2.5 GM/ 10 ml          | *ALOC (< 2 years):* 2 ml/ kg IV/IO                      |
| Dextrose 50%                 | 25 GM/ 50 ml           | *ALOC (> 2 years):* 1 ml/ kg IV/IO                      |
| Diphenhydramine (Benadryl)   | 50 mg/ 1 ml “or” 50 mg/ 10 ml | 1 mg/ kg IV/IO/IM  
  IV/ IO max. dose 25 mg/ min.  
  IM max. dose, 50 mg. |
<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Administration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epinephrine 1:1000</td>
<td>1 mg/ 1ml</td>
<td>EpiPen Jr.® 0.15mg</td>
<td><strong>Allergic Reaction</strong> moderate/severe/anaphylaxis: 0.01 mg/kg IM (0.01 ml/kg). Max. dose of 0.6 mg (0.6 ml). EpiPen Jr®; repeat as needed in 5 min. <strong>Upper Airway/Stridor</strong>: 5mg in 5ml via nebulizer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Anaphylaxis</strong>: If no response to Epi 1:1000, give 0.01mg/kg (0.1ml/kg) of 1:10,000 IV/IO. <strong>Bradycardia</strong>: 0.01mg/kg (0.1ml/kg) IV/IO. <strong>Cardiac Arrest</strong>: 0.01mg/kg (0.1ml/kg) IV/IO.</td>
</tr>
<tr>
<td>Epinephrine 1:10,000</td>
<td>1 mg/ 10ml</td>
<td></td>
<td><strong>Upper Airway/Stridor</strong>: 5mg in 5ml via nebulizer. <strong>Cardiac Arrest</strong>: 0.01mg/kg (0.1ml/kg) IV/IO.</td>
</tr>
<tr>
<td>Glucagon</td>
<td>1 mg/ 1ml</td>
<td></td>
<td>0.03 mg/kg IM (max. dose 1 mg)</td>
</tr>
<tr>
<td>Ipratropium (Atrovent)</td>
<td>500 mcg per unit dose</td>
<td>Unit dose</td>
<td></td>
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<tr>
<td></td>
<td>(2.5 ml)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lidocaine 2% (preservative free)</td>
<td>20 mg/1 ml</td>
<td></td>
<td><strong>IO insertion for pts &gt;3kg</strong>: Infuse 0.5mg/kg slowly (up to a maximum dose of 40mg). May repeat as needed x 1 using ½ of initial bolus.</td>
</tr>
<tr>
<td>Midazolam (Versed)</td>
<td>2 mg/ 2ml</td>
<td>IN: 5 mg/1 ml</td>
<td><strong>Cardioversion</strong>: 0.05mg/kg slow IV/IO. Max. initial dose 1mg. <strong>Seizure (see policy for specifics)</strong>: IV/IO=0.05 mg/kg; MR q 3’ (Max=5mg) IM=0.1mg/kg; MR in 10 minutes x1 IN= 0.2mg/kg; Max.= 5 mg.</td>
</tr>
<tr>
<td>Morphine Sulfate</td>
<td>10 mg/ 10 ml</td>
<td>10 mg/ 1ml</td>
<td><strong>Pain Management</strong>: 0.1mg/kg (0.1ml/kg) slow IV/IO/IM. MR X 1 in 15 min. if IV/IO or 30 min if IM. <strong>Burns</strong>: 0.1 mg/kg IV/IO/IM in incremental doses up to 0.3mg/kg</td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Naloxone (Narcan)</td>
<td>2 mg/ 5 ml</td>
<td>2mg/2ml</td>
<td><strong>Suspected OD in non-neonate</strong>: 0.1 mg/kg (0.25 ml/kg) IV/IO/IM</td>
</tr>
<tr>
<td>Ondansetron (Zofran)</td>
<td>4 mg</td>
<td></td>
<td><strong>Patients ≥ 4 yrs</strong>: 4 mg ODT or slow IV over 30 seconds <strong>Patients 2-4yrs</strong>: 2mg ODT or slow IV over 30 seconds.</td>
</tr>
<tr>
<td>Sodium Bicarbonate</td>
<td>50 mEq/ 50 ml</td>
<td>Tricyclic Antidepressant OD with significant dysrhythmias: 1mEq/ kg IV/ IO</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** If the above concentrations become unavailable, providers may use alternate available concentrations or packaging.
PEDIATRIC INTRAOSSEOUS INFUSION
PROCEDURE

ALWAYS USE BODY SUBSTANCE ISOLATION PRECAUTIONS

INDICATIONS
- Patient in extremis, cardiac arrest, or profound hypovolemia and in need of immediate delivery of medications or fluids and IV access is not possible in 90 seconds

CONTRAINDICATIONS
- Absolute:
  - Recent fracture of involved bone (less than 6 weeks)
  - Vascular disruption proximal to insertion site
  - Inability to locate landmarks
- Relative:
  - Infection, scarring or burn overlying the site
  - Congenital deformities of the bone
  - Metabolic bone disease

EQUIPMENT
- Intraosseous needle or mechanical device
- Betadine swabs/ solution/ gauze
- 5-12 ml syringe
- Lidocaine 2% (Preservative Free)
- Saline
- IV NS solution
- IV tubing with 3 way stopcock
- Supplies to secure infusion

PROCEDURE
- Aseptic technique must be followed at all times
- All approved ALS IV medications may be administered IO
- Position and stabilize leg
- Prepare skin with betadine swabs or solution on gauze
- Air or gauze dry
- Fill 5-12 ml syringe with 5 ml saline
- IV NS solution, flood tubing with a 3 way stopcock
- IO device:
  - Locate primary site 1-2 cm distal to the tibial tuberosity and 1-2 cm medial
  - Locate secondary site according to manufacturer’s specification
  - Insert needle through skin at 90 degree angle to the periosteal surface (bone contact)
  - Rotate applying gentle, steady pressure, letting the driver do the work
  - Stop when a change of resistance is felt (indicating entrance into the medullary space)
  - Stabilize hub and remove stylet
  - Confirm placement
  - Attach 5-12 ml syringe with 5 ml saline to needle
- Syringe bolus with 5 ml saline
- For patients >3kg: If awake and/or responsive to pain, infuse 2% Lidocaine 0.5mg/kg slowly (up to a maximum dose of 40mg). May repeat as needed x 1 using ½ of initial bolus.
- Mechanical device:
  - 1cm medial or distal to tibial tuberosity (0-6 years)
  - 1-2 cm medial or distal to tibial tuberosity (6-12 years)
  - Choose the desired depth of injection (see packet insert for manufactures instructions)
  - Position needle, insert at 90 degrees, and remove devices following manufacture’s instructions)
  - Confirm placement
  - Attach 5-12 ml syringe with 5 ml of saline in needle
  - Flush with 5 ml saline
- Aspirate to confirm position, if needle flushes without resistance proceed
- If resistance is met, remove needle and apply pressure to site
- Attach pre-flooded IV tubing
- Stabilize according to manufacturer’s direction
- Administer fluid boluses via syringe utilizing the 3 way stopcock

**SPECIAL CONSIDERATIONS**
- Limit attempts for IO access at scene to no more than 2