

# EMS Patient Care Guidelines

- Fargo-Moorhead  
Ambulance
- Thief River Falls  
Ambulance
- Hillsboro  
Ambulance
- Luverne  
Ambulance
- Worthington  
Ambulance

# Introduction

This document describes the methods by which F-M Ambulance Service, Thief River Falls Area Ambulance, Hillsboro Ambulance Service, Luverne Ambulance and Worthington Ambulance will continue to provide the best care possible in our practice of medicine. It is a dynamic document that will continue to change in an effort to provide our patients with evidence based practice and the best possible outcome.

Patient Care Guidelines is now presented in an algorithmic format. This format lends itself to being a rapid reference guide and reduces the need for extensive reading, recall of treatment steps and recollection of drug doses. In essence making it, not only a prescription for care, but a clinical tool to improve quality and reduce the risk of error. While this algorithmic approach helps to improve safety it does not absolve us of our duty to thoughtfully apply the prescribed treatments. We are still dependent upon the professionalism, knowledge and teamwork of our providers to utilize these treatments when and where appropriate. When a guideline does not fully meet the patient's needs, the provider should discuss with medical control an appropriate modified treatment plan.

All care is based on thorough patient assessment and the universal patient care guideline. The provider then moves to the guideline that best addresses the patient's illness/injury. The algorithmic format may shunt the provider to another guideline based on further assessment.

## Acknowledgements

F-M Ambulance Service would like to thank the following people for their work and time commitment to re-formatting and maintaining these guidelines.

- Medical Director Heidi Lako-Adamson, MD
- City of Austin/Travis County, TX EMS System for their template and advice
- All members of the Clinical Advisory Group
- Harlan Vandekieft

## Revisions

The Medical Director will review these patient care guidelines annually. Parts of this document may be reviewed more often if required. The full review date will be printed on the cover of this document. All signatures and revisions will be maintained by the QI Manager. Any revision will be designated by being underlined. The underline will be removed at the next yearly revision.

Reviewed & Approved      January 2014  
Reviewed & Approved      February 2015  
Reviewed, combined with above services & approved      January 2016

# Revisions

<b>July 2015</b>	
Corrected peds spinal precautions wording to mimic adult procedure.....	U4
<b>Sept 2015</b>	
Added Cyanide Poisoning.....	SC12
<b>December 2015 – Considered yearly review for starting 2016</b>	
Combined protocols with Thief River Falls, Hillsboro & Luverne, fixed formatting issues, added color.....	entire document
Changed minimum acceptable SpO2 to 92% and added i-Gel airway.....	entire document
Added AEMT level, removed IVs from TRF EMT, added variances for EMTs, added note about EMT-I and EMR.....	U1a&b
Added assessment and exam info.....	U2a,b&c
Removed nasal intubation, updated ventilatory rate, added i-Gel and description of effective airway.....	U3
Reformatted and added IO for EMT in MN.....	U5
Changed FMA to Sanford Health EMS.....	U7
Added caution about using narcotic and benzo together in elderly.....	U8
Clarified statement #1 under code level II when CPR has been initiated, clarified trauma arrest statement.....	U11
Added Epi-pen.....	M6
Added clarification for repeat doses of versed and ativan.....	M8
Added diversion information.....	M9
Updated phone number for ND.....	M10
Combined with excited delirium, added zyprexa option for mild agitation.....	M11
Clarified dosing for shivering in pearls.....	M14
Added "if rales" box.....	M16
Added benedryl option for pregnant patients.....	M17
Combine w/delivery procedure and added abnormal delivery situations.....	M20
Added EMT STEMI alert criteria, diversion criteria, note about 18 ga IV, Altru's number.....	M22
Removed comment about aggressively oxygenating.....	M23
Added metoprolol as a system option.....	M24, M25, drug formulary
Added comments about when to transport patients.....	M27, M28, M29
Clarified when to give amiodarone drip.....	M30
Changed amount of cold fluid.....	M31
Added Epi-pen.....	P5
Added monitoring EtCO2.....	P6
Changed first Epi time to 3 minute goal in Pearls, changed amiodarone to repeat x1.....	P15, 16
Combined pediatric burns with adult protocol.....	P22, T6
Added captain's seat reference, skin to skin comment, and changed passenger seat advice.....	P23
Added zofran should be administered over 2 minutes IV.....	U8, M17, P6, SC5, SC6
Added TXA.....	T1
Updated note about county calls.....	T2
Updated helmet removal to current athletic trainer guidelines.....	T4
Updated Parkland formula for peds patients, added pearls regarding cyanide poisoning, electrical & chemical burns.....	T6
Added 15 minute criteria to return of pulse.....	T7
Added note about spinal precautions.....	T8
Added note about using tourniquet prior to removal of a crushed extremity.....	T11
Added EMT 12-lead & Alert information, added Sgarbossa criteria.....	CP1
Added information on Nova Express.....	CP6
Added 3 <sup>rd</sup> and 4 <sup>th</sup> Notes/Precautions.....	CP7
Added note about i-gel.....	CP9
Added i-gel airway.....	CP10
Added placement info for peds distal femur.....	CP13
Added Hare & Sager splints.....	CP14
Updated breaths/min.....	CP18
Added Orthostatic Vital Signs.....	CP19
Updated with new guidelines.....	CP21
Added Surgical Cricothyrotomy.....	CP26
Added Core Temperature Monitoring.....	CP27
Added Cardioversion & Pacing.....	CP28
Re-wrote to include more indications and updated procedure.....	SC1a&b
Removed Bariatric procedure, Refer to company policies and procedures.....	SC4
Moved Rule of Nines from Appendix to Burn Protocol.....	A2, T6
Added Cardizem.....	A7
Added Glasgow Coma Scale and pupil gauge.....	A10
Added note on front page.....	drug formulary
Added note about only ND.....	drug formulary
Added TXA.....	drug formulary

# Revisions Continued

## March 2016

Created MN Blood Collection.....CP29

## May 2016

Standardized Ativan dose to 1-2 mg, also added anti-depressants to exclusion list for charcoal.....M11 & 12

Added Narcotic Overdose protocol.....M13

Clarified to call Sanford One Call instead of ED for STEMI Alert.....M22

Removed PEARL about Atropine and ischemia.....M23

Added details regarding giving narcan to peds patient.....P6

Removed weight from title.....P10

Removed weight and added AHA puberty guideline in title.....P14, 15, 16, 17

Changed IN narcan to EMT skill.....CP8

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Every credentialed provider that delivers medical care within Sanford Health Ambulance Services must be able to perform skills consistent with the scope of practice in their respective state(s). Each credential level builds on all previous credential levels (i.e., Paramedic is responsible for all EMT skills). The following defines the approved skills by credential level for providers with F-M Ambulance, Thief River Falls, Luverne & Hillsboro Ambulance Services.

## Emergency Medical Technician (EMT)

- Patient assessment
- Spinal immobilization
- Epi-pen
- Oxygen administration
- Bag-valve mask device
- Pulse oximetry
- Nasopharyngeal airway
- Oropharyngeal suctioning
- Continuous positive airway pressure (CPAP)
- Nitroglycerin (sublingual, SL)
- Auto-Injected epinephrine
- Traction splint
- Bandaging and splinting
- CPR/AED application
- Emergency childbirth
- Tourniquet
- BURP
- Blood glucose assessment
- Aspirin
- Activated charcoal
- Oral glucose administration
- 12-lead ECG acquisition, if trained
- Humidified oxygen

**Emergency Medical Technician (EMT) are also expected to complete and stay current with the variance training needed for the following skills:**

- Non-medicated IV fluid maintenance
- Nebulized medications
- King LTS-D or i-Gel airway
- Glucagon (MN only)
- IO (MN Only)

**MN & ND differ in their allowances of skills between the EMT and AEMT level especially with variances. Please pay special attention when skills are marked ND or MN. EMTs at F-M Ambulance will always follow ND skills no matter where they pick the patient up. Guidance on required paperwork is listed in the BLS protocols for that respective state.**

## Advanced Emergency Medical Technician (AEMT)

*All EMT-Enhanced requirements, skills and interventions, plus:*

- Peripheral intravenous access (IV)
- Dextrose IV/IO
- Glucagon IM (ND Level)
- Isotonic crystalloids (LR, 0.9%NaCl, D5W) IV/IO
- Ventilator
- Intraosseous access (IO) (ND Level)
- Naloxone (Narcan) IN

## Paramedic (P)

*All Advanced EMT requirements, skills and interventions, plus:*

- All medications and routes as outlined in EMT and Paramedic protocols
- Pleural decompression
- Manual cardioversion, defibrillation and pacing
- Therapeutic hypothermia (ROSC)
- Gastric tube insertion
- EtCO<sub>2</sub> assessment
- ECG monitoring and interpretation
- CO monitoring
- Intubation, including video assisted
- Determination of death pronouncements
- Tracheal Suctioning
- Alternate vascular access (no intialization)
- IV pumps, including medication drip maintenance

## Paramedic – (Crew Leader 1) Enhanced Skills/Medications (CL1)

All EMT & Paramedic requirements/skills/interventions plus

- RSI/RSA
- Ketamine for chemical restraint
- QuikTrach

## Tactical Paramedic (for TEMS calls only)

*All EMT & Paramedic requirements/skills/interventions plus:*

- Chest tube
- Cricothyrotomy
- Combat Gauze



Skills are designated within each protocol by the box in which it is written. The legend is as follows:

Care listed in a plain box can be performed by EMT level or higher

**A** Care in a box with blue strip "A" means AEMT or higher may perform this skill. **A**

**P** Care in solid red box with "P" means Paramedic may perform this skill. **P**

**CL1** Care in a grey checked "CL1" box means only paramedics with special training may perform this skill. Crew Leader 1's may direct other paramedics to perform this skill. **CL1**

If the inside of the box is colored it is referring you to that section of the book to find the other protocol.

*\*\*In the event that medical control cannot be contacted after appropriate attempts, treatments listed in the medical control box may be given if medically appropriate.*

**M** Care in this box can only be performed AFTER receiving instructions from medical control **M**

## Emergency Medical Responders (EMRs)

While EMRs are not included in this set of guidelines, they are still recognized as a very integral part of Emergency Medical Services. We have elected to not include them here as neither ND nor MN allow them as the primary care provider in a transporting ambulance which is the purpose of this document. They can be extremely helpful with the following skills or as specifically directed by a higher trained provider. Identical BLS protocols that focus on the EMR are designed to be an adjunct to this document.

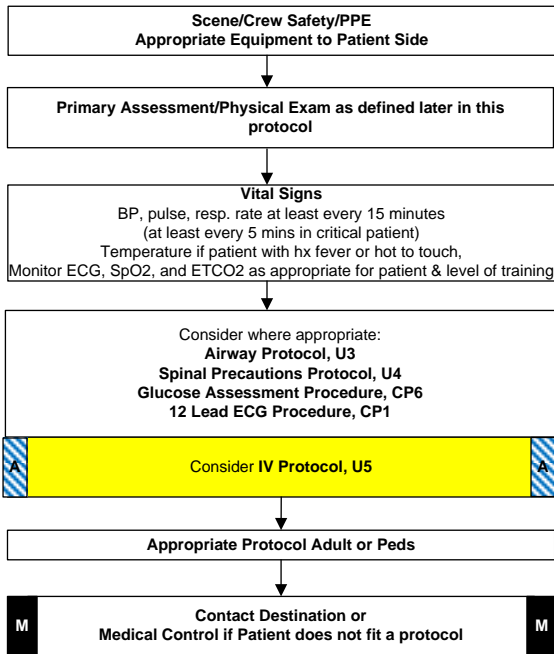
- Patient assessment
- Spinal immobilization
- Epi-pen
- Oxygen administration
- Bag-valve mask device
- Bandaging and splinting
- CPR/AED application
- Emergency childbirth
- Tourniquet
- BURP

## Emergency Medical Technician – Intermediate 85 (EMT-I)

There is only one EMT-I in our EMS system as they are phasing out this level nationally. In the interim, the EMT-I can do the following skills. These are not marked specifically throughout the protocols and differ from the AEMT level.

- Peripheral intravenous access (IV)
- Dextrose IV/IO
- Isotonic crystalloids (LR, 0.9%NaCl, D5W) IV/IO
- Ventilator

<p><b>History</b></p> <ul style="list-style-type: none"> <li>Location</li> <li>Onset</li> <li>Precipitating events</li> <li>Quality</li> <li>Radiation</li> <li>Severity</li> <li>Modifying factors</li> <li>Associated symptoms</li> <li>Prior hx of same/similar</li> <li>S-A-M-P-L-E</li> <li>Allergies</li> </ul>	<p><b>Exam:</b></p> <ul style="list-style-type: none"> <li>Primary Assessment                     <ul style="list-style-type: none"> <li>Airway &amp; Breathing</li> <li>Circulation</li> <li>Disability</li> <li>Expose</li> </ul> </li> <li>Secondary Assessment                     <ul style="list-style-type: none"> <li>HEENT</li> <li>Respiratory</li> <li>Cardiovascular</li> <li>Abdomen</li> <li>Extremities</li> <li>Neuro</li> </ul> </li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>Vascular</li> <li>Infectious/Inflammatory</li> <li>Trauma/Toxins</li> <li>Autoimmune</li> <li>Metabolic</li> <li>Idiopathic</li> <li>Neoplastic</li> <li>Congenital</li> </ul>
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Maintain all appropriate medications and procedures that have been initiated at the referral agency or institution

<p><b>Pearls:</b></p>	<ul style="list-style-type: none"> <li>Minimum exam for every patient is: V/S, mental status/GCS, location of injury or complaint and pain scale.</li> <li>For the dosing of medications or electrical therapy an adult is defined as <math>\geq 37</math> Kg (80 lbs).</li> <li>For the dosing of medications or electrical therapy a pediatric patient is <math>&lt; 37</math> Kg (80 lbs) and also defined by the Broselow Tape. If the patient does not fit on the tape, they are considered an adult.</li> <li>These protocols provide a baseline for care and are not meant to be all inclusive.</li> </ul>
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## Response:

- Review the dispatch information and select appropriate response.

## Scene Arrival & Size-up:

- Body Substance Isolation (BSI)
- Consider personal Protective Equipment (PPE)
- Evaluate the scene safety
- Determine the number of patients
- Consider the need for additional resources

## Patient Approach:

- Determine the Mechanism of Injury (MOI)/Nature of Illness (NOI)
  - For all emergency scenes where patient needs exceed available EMS resource, initial assessment and treatment shall be in accordance with an approved triage methodology.

## Initial Assessment: *Correct life-threatening problems as identified.*

### Airway

- Open and establish airway
  - ◆ Head tilt-chin lift if no suspicion of cervical spine injury
  - ◆ Jaw thrust if evidence of potential cervical spine injury
  - ◆ Assess for patency, and partial or complete obstruction
- Suction as necessary
- If necessary, insert airway adjunct
  - ◆ Oral airway if gag reflex is absent
  - ◆ Nasal airway if gag reflex is present
- Cervical Spinal Immobilization
  - ◆ If patient presents with a traumatic mechanism of injury, refer to Spinal Precautions-U4

### Breathing

- Determine if breathing is adequate, assess rate, depth, chest rise, equality and SpO<sub>2</sub>
  - ◆ Administer oxygen as appropriate to maintain O<sub>2</sub> sat of 92% or greater.
  - ◆ Patients with a history of prescribed home oxygen for chronic conditions should receive their prescribed home dosage of oxygen or higher as needed to maintain their normal SpO<sub>2</sub>
  - ◆ Nasal cannula recommended 2-6 lpm; masks and BVM recommended >8 lpm.
  - ◆ If patient is unresponsive, BLS consider oral/nasal adjuncts or King Tube.  
ALS consider Endotracheal Intubation.

### *Never withhold oxygen from a patient in respiratory distress!*

### Circulation

- Assess pulse (rate, regularity, quality)
  - ◆ Bradycardic pediatric patients go to CP-21
- Assess for and manage profuse bleeding
- Assess skin color, temperature and capillary refill.
- Apply cardiac monitor when appropriate
- Any patient complaining of chest pain or shortness of breath should have a 12 lead EKG performed and transmitted to the appropriate facility.

### Disability

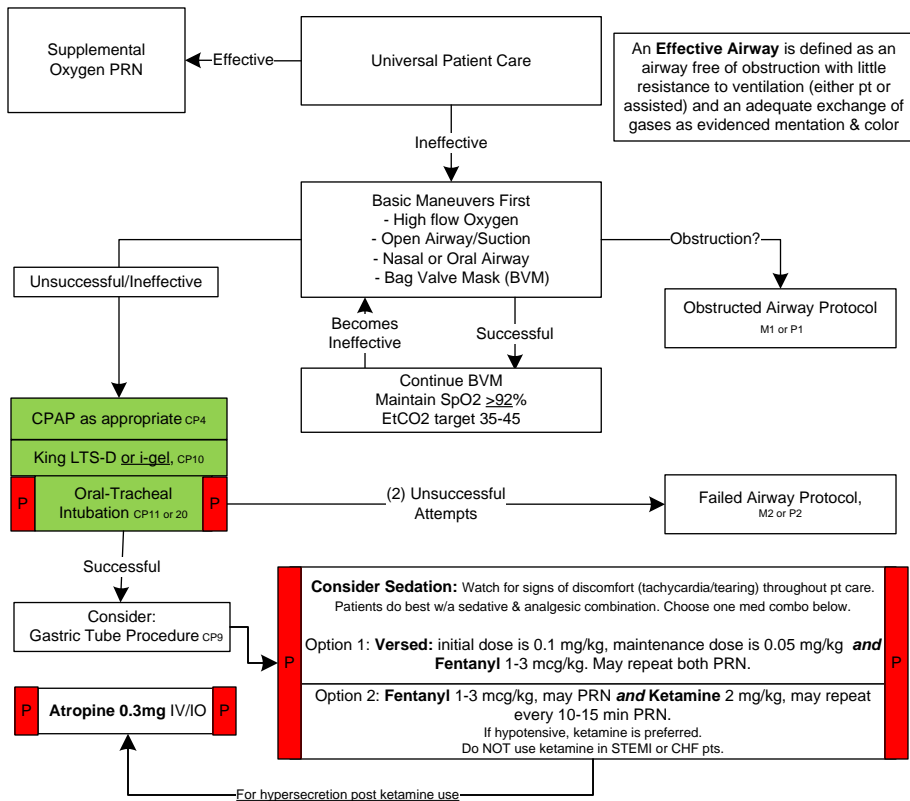
- Pupils, posturing, seizures, Glasgow Coma Scale (GCS)
- Assess mental status using AVPU scale
  - ◆ Alert
  - ◆ Verbal stimuli
  - ◆ Painful Stimuli
  - ◆ Unresponsive
- Check Pulse, Motor, and Sensory (CMS)

### Exposure

- To assess patient's injuries, remove clothing as necessary, considering condition and environment.

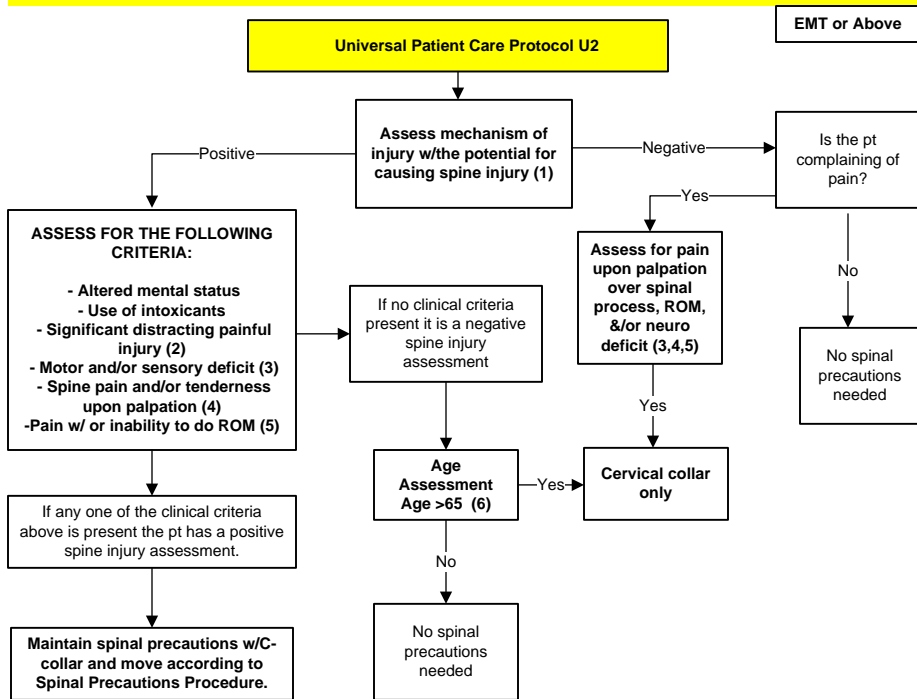
## History & Physical Examination:

- **For UNSTABLE/UNRESPONSIVE trauma patients:**
  - Conduct rapid trauma assessment, assessing for DCAP-BTLS:
    - ◆ Head: crepitation, blood/fluid from ears, nose, mouth or eyes
    - ◆ Neck: JVD, tracheal deviation, medical alert device
    - ◆ Chest: crepitation, paradoxical motion, respiration, lung sounds
    - ◆ Abdomen: rigidity, tenderness, distention
    - ◆ Pelvis/GU: pain on motion, blood, urine, feces, priapism
    - ◆ Extremities: pulse, motor, sensory, range of motion, edema
    - ◆ Posterior: bruising
  - Obtain baseline vital signs
  - Obtain SAMPLE history
  
- **For STABLE/RESPONSIVE trauma patients**
  - Determine chief complaint
  - Perform focused examination of the injured site and areas compatible with given MOI.
  - Obtain baseline vital signs
  - Obtain SAMPLE history
  
- **For UNSTABLE/UNRESPONSIVE medical patients:**
  - Perform rapid physical examination:
    - ◆ Head & Neck: JVD, medical alert device
    - ◆ Chest: respiration, lung sounds
    - ◆ Abdomen: rigidity, tenderness, distention
    - ◆ Pelvis/GU: blood, urine, feces, priapism
    - ◆ Extremities: pulse, motor, sensory, medical alert device
    - ◆ Posterior
  - Obtain baseline vital signs
  - If possible, obtain history of episode from family or bystanders (OPQRST).
  - If possible, obtain SAMPLE history from family or bystanders.
  
- **For STABLE/RESPONSIVE medical patients**
  - Determine chief complaint
  - Obtain history of episode (OPQRST)
  - Obtain baseline vital signs
  - Obtain SAMPLE history
  - Perform focused physical exam, checking areas suggested by the MOI.
  
- **Perform detailed and ongoing assessments as dictated by patient condition.**
  - Reassess unstable patients frequently, recommended every 5 minutes.
  - Reassess stable patients at a minimum of every 5 minutes.
  - For stable patients on long distance transfers, they should be reassessed at least once an hour or as condition changes.
  
- **For TREATMENT**
  - Refer to specific protocol that most closely matches patient's complaint.
  - May use more than one protocol as appropriate.



## Pearls:

- For this protocol, pediatric is defined as less than 37kg or any patient which can be measured within the Broselow-Luten tape. The majority of pediatric airways are managed with basic interventions. Use only the interventions needed to deliver adequate oxygenation and ventilation.
- Capnography (EtCO<sub>2</sub>) and pulse oximetry must be utilized with all advanced airways. Document Results.
- If an effective airway is being maintained by BVM with pulse oximetry ≥92%, it is acceptable to continue with basic airway measures instead of intubation.
- If difficult intubation is anticipated consider early use of King LTS-D, i-Gel Airway, King Vision, or assisted intubation with Bougie, two handed intubation, and BURP maneuver. (CP11, 12 & 20)
- If intubation attempt fails CHANGE something: different blade, smaller tube size, or use adjunctive maneuver.
- An intubation attempt is when the tube passes the plane of the teeth or King Vision tip.
- Ventilatory rate should be 10-12 per minute (one breath every 5-6 seconds) OR age appropriate (infants: one every 3-5 seconds) to maintain EtCO<sub>2</sub> of 35-45.
- Maintain C-Spine precautions in those patients with suspected spinal injury.
- For advanced airways secure airway with tube holder and complete intubation verification form.
- Those paramedics approved for RSI may use the RSI procedure to assist in securing a patent airway. (M5 or P4)
- Reassess and document ETT/King Airway/i-Gel placement after every move and at transfer of patient care.



## Pearls

- 1 - Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes. Assaults with significant head, neck, or back trauma or anything else that could cause spinal injury would be considered positive. Isolated penetrating trauma does not necessarily require immobilization.
- 2 - Significant distracting injuries are defined as an injury the pt is aware of that is causing them distress and inhibiting their ability to concentrate on answering questions during assessment.
- 3 - Any unexplained focal, motor, or sensory neurological deficit (tingling, reduced strength or numbness).
- 4 - Point pain or tenderness over spinous process. Assess each bony prominence to be in-line and without pain or injury.
- 5 - Range of Motion: The patient must be able to touch their chin to their chest, extend their neck (look up), and turn their head from side to side (shoulder to shoulder) without pain. Do NOT assist with ROM. Don't assess ROM if pain is present and stop if pain appears.
- 6 - In very old and very young patients, a normal exam may not be sufficient to rule out spinal injury.
  - Remember to remind hospital staff of potential for spinal injury and describe mechanism of injury in detail.
  - The decision to NOT implement spinal immobilization in a patient is the responsibility of all providers.
  - If the First Responder has a concern for spinal cord injury not addressed by these criteria; patients may be immobilized at the Responder's discretion. If a patient has been immobilized, the pt may be reassessed once on the cot and, if appropriate, removed from the board.

## General Guidance:

- Spinal Precautions mean a c-collar and limited movement, not necessarily immobilized to a device.
- C-collars should be placed prior to any patient movement if possible.
  - If no collar fits the patient, use towel or blanket roll, head block, etc to support neutral head alignment. It must not interfere with the airway.
- Long extrication device (backboard, scoop stretcher) is indicated when the pt cannot self extricate. It is used to move the pt to the ambulance cot.
- Log Roll Procedure requires 2 or more personnel in contact with the pt.
- When the scene or pt condition poses an imminent or potential life threatening danger, remove the pt from danger while the best attempt is made to maintain spinal precautions.
- Manual in line stabilization must be used during any procedure that risks head or neck movement such as intubation.

## Procedure:

- Patients with a positive spinal injury assessment should have spinal precautions maintained during transport.
- For ambulatory patients with a positive assessment place a c-collar and place the patient on the ambulance cot in a position of comfort, limiting movement of the spine during the process. No standing takedowns.
  - Patients may self-extricate when possible (stable, alert, w/o neuro deficits) after placement of c-collar.
- Major trauma patients who require extrication should have spinal precautions maintained using an extrication device (long backboard or equivalent) during extrication.
  - If sufficient personnel are present, the patient may be log rolled from the extrication device to the ambulance cot during loading of the patient.
  - Patients may remain on the extrication device if the crew deems it safer for the patient considering stability, time and patient comfort considerations. This decision will be at the discretion of the crew.
- Once the patient is placed on the ambulance cot, if no extrication device is still in place, secure the patient with seatbelts in a supine position, or in position of comfort if a supine position is not tolerated.
  - Head may be supported with head block or similar device to prevent rotation if needed. Padding should be placed under the head when practical. Do not tape the head to the ambulance cot.
- Pts remaining on the immobilization device must be secured to the device starting with the torso and ending with the head blocks or similar device. The immobilization device and pt must then be secured to the cot with seatbelts, including shoulder straps that are placed through the backboard handles.
- Patients > 65 with a potential mechanism will have a c-collar applied even if the spinal assessment is negative.
- Rigid immobilization should be avoided if it contributes to patient combativeness.

## Pediatric Considerations:

- Infants restrained in a rear-facing car seat may be immobilized and extricated in the car seat. The child may remain in the car seat if the immobilization is secure and pt condition allows.
- Children restrained in a car seat with a high back may be immobilized and extricated in the car seat. However, once removed from the vehicle, the child should have spinal precautions maintained as for an adult.
- Children restrained in a booster seat (without a back) need to be extricated and immobilized following spinal precautions maintained as for an adult.

IVs are AEMT or Above

## IV ACCESS:

- BSI and aseptic technique must always be followed. Prep site with chlor prep or alcohol prep and wait 30 seconds to dry.
- Two IV attempts on scene or three IV attempts total is our standard. Do not extend scene times for multiple IV attempts. Exceptions to the rule must be determined by providers. Weigh carefully the patients need for an IV versus other available options for delivering the appropriate treatment.
- In the cardiac arrest/critical patient, any preexisting external venous catheter may be used with the exception of a dialysis shunt.
- Upper extremity IV sites are preferable to lower extremity sites (except Cardiac Arrest).
- When pt requires IV access and peripheral IV is not accessible, the paramedic may use the External jugular (EJ) vein. IV catheter should be 2 1/2" or longer. IO access may be preferred.
- In post-mastectomy patients, avoid IV, blood draw, injection, or blood pressure in arm on affected side.
- Prior to attaching any luer lock device to a hub, the hub should be scrubbed w/alcohol for 10 seconds.

**IV LOCKS** are appropriate for the following patients. All medications administered via a lock must be flushed with 5-10 mls of saline.

- Anticipated need for medication in non-hypovolemic conditions
- Chest pain
- Isolated Head injuries
- Confusion
- Seizures
- Dyspnea
- Drug Overdose
- Hypertension with SBP > 200
- CVA/TIA
- Isolated extremity trauma
- Pain control with no potential need for volume replacement

**IV FLUIDS** should be used for the following patients.

- All IV rates should be kept at TKO (minimal rate to keep vein open) unless administering fluid bolus.
- Pediatric pt's should have a Dial a drip tubing attached to help control/minimize fluid rates.
- Trauma Patients
  - Unstable or potentially unstable trauma pts should have two large bore IVs for access, *fluids per pt condition*.
  - Bleeding or anticipated bleeding
  - Hypotension
  - Burns
  - Crush
  - Blunt trauma
  - Head trauma
  - Penetrating trauma
  - Abdominal/thoracic trauma
  - Any of above with need to pain control
- Medical Patients
  - Hypovolemia
  - Hypoglycemia
    - dextrose should always be given with fluids running
  - Tachycardia
  - Myocardial Infarction
  - Hyperglycemia
  - Dehydration
  - Hypotension
  - Anticipated need for fluid/medications

## IO ACCESS: See CP-13 for procedure details

EMT or Above in MN

- Any prehospital fluids or medications approved for IV use, may be given through an intraosseous site.
- Any patient with IO should have fluids running.
- If drip rate slows, flush with 10 ml normal saline. Always consider pressure infuser with IO's. Monitor frequently and adjust pressure accordingly. Flow rates of up to 9L/hr can be achieved with pressure infusion.
  - Use caution in HTN and pulmonary edema pt.
  - Beware of overinflating of bag, especially with blood products.
  - Maintain awareness of too much pressure and **watch for signs of infiltration**.
- In transported **Trauma Arrest** patients the IO should be performed enroute to the hospital.



## Standard:

Establish the minimum documentation requirements for every patient contact.

## Purpose:

To provide consistent, thorough, and accurate documentation of the events of a patient encounter.

## Application:

- For every patient contact, the following documentation requirements apply and must be present:
  - Patient demographics
  - Pertinent history, medications, allergies
  - Full set of vital signs
  - Primary Impression ("Other" and "No Complaints" always need to be explained)
  - All interventions performed and the outcomes from those interventions
  - Pertinent assessment
    1. Medical and minor trauma may have a focused assessment
    2. Major trauma should have a full assessment
  - Consistent narrative that does not contradict rest of document
  - Use of appropriate Specialty Patient tools
  - Destination/disposition information
  - Insurance information
  - Patient signature. If patient is unable to sign, a family member/guardian or representative from receiving facility must sign on patient's behalf
  - Crew Signatures
  - Medical Necessity must be filled out if patient is transported
- Be truthful, accurate, objective, pertinent, legible, and complete with all parts of documentation.
- Use only approved medical abbreviations per our protocols.
- Reflect the patient's chief complaint and a complete history or sequence of events that led to their current request or need for care.
- Reflect ongoing monitoring of abnormal findings.
- Monitor information will be attached to the PCR.
- Any additional documentation (ex. PCS, orders, hold) will be scanned and attached to the PCR.
- Document clearly any requested orders, whether approved or denied.
- Document any narcotic waste including the quantity wasted, name and title of the person who witnessed the waste.
- Explain why an indicated and/or appropriate assessment, intervention, or action prescribed by the protocols did **NOT** occur. Also describe any complex call or out-of-the ordinary situations.
- Remain confidential and share only with legally acceptable entities.
- Once the PCR is locked, any changes required to correct a documentation error or for clarification shall be recorded in an addendum.
- Team members will not leave their shift until all documentation has been completed and made available to the receiving hospital.

## Hospital Information:

- Either prior to or during transport, a brief patient care report will be provided to the receiving emergency department via 2-way radio or telephone. At a minimum the information should include: age, chief complaint, pertinent medical history, interventions, current condition and estimated time of arrival to the ED.
- After arrival at the receiving ED, the crew will provide a full verbal patient care report to the receiving registered nurse and/or the receiving physician.
- The EMS crew will immediately start an electronic PCR. As soon as finished, the report will be locked and uploaded so the receiving hospital has access to the ePCR. If the receiving hospital does not have access to our ePCRs, the crew will transmit as soon as it is completed for continuation of patient care purposes or leave a copy at the receiving facility.
- See Appendix A3 for help giving verbal report especially for trauma patients.

## Standard:

To establish guidelines for Providers when addressing issues of consent or for patients who wish to refuse the treatment and/or transportation offered.

## Purpose:

Adult or pediatric patients under parental/guardian supervision with full mental capacity retain the right to refuse care and/or transport against medical advice. There may be both victims and patients on scene. A victim is defined as someone involved in an incident that does not have injuries or a medical problem. A patient is someone who requests EMS assessment/intervention or someone that has an injury/illness or sustained a significant mechanism of injury. There is a legal obligation of EMS to assess for the competency to refuse services and to provide adequate medical care up to that point.

## Implied Consent

In potentially life-threatening emergency situations where a patient is unable to give informed consent the law presumes that the patient would give consent if able. In potentially life-threatening emergency situations, consent for emergency care is implied if the individual is:

- Unable to communicate because of an injury, accident, illness, or unconsciousness and suffering from what reasonably appears to be a life-threatening injury or illness **OR**
- Suffering from impaired present mental capacity **OR**
- A minor who is suffering from what reasonably appears to be a life-threatening injury or illness and whose parents, managing or possessory conservator, or guardian is not present

## Application:

- All patients refusing treatment and/or transport must:
  - Be at least 18 years of age or an Emancipated Minor;
  - Be alert, oriented and able to care for his/her self,
  - NOT have been declared legally incompetent by a court of law. (If a patient has been declared legally incompetent, his/her court appointed guardian has the right to consent to, or refuse, evaluation, treatment, and/or transportation for the patient.)
  - NOT be suicidal or homicidal. (Law Enforcement or medical control must be contacted regarding the degree of threat and ability to place a psychiatric hold.)
- Patients meeting the above criteria who demonstrate present mental capacity retain the right to refuse any or all treatment and/or transportation. Present mental capacity will be assessed by the patient's ability to demonstrate the following:
  - The patient understands their illness or injury and the benefits of treatment and/or evaluation **AND**
  - The patient understands the consequences (including death) of not seeking treatment and/or evaluation of their illness or injury **AND**
  - The patient understands the alternatives to immediate care by EMS **AND**
  - The patient can describe, in his/her own words, the above components.
- **Sanford Health EMS** providers shall not discourage any patient (or legal patient representative) from seeking medical care from a physician or from accepting EMS transport to a hospital.
- When scene conditions permit, other resources such as EMS partner, law enforcement or family will be utilized to help explain the benefits of transport to the patient.
- Use great caution with non-English speaking patients. Use language interpretation service as needed.
- A patient refusal information sheet will be explained and given to each patient refusing care.

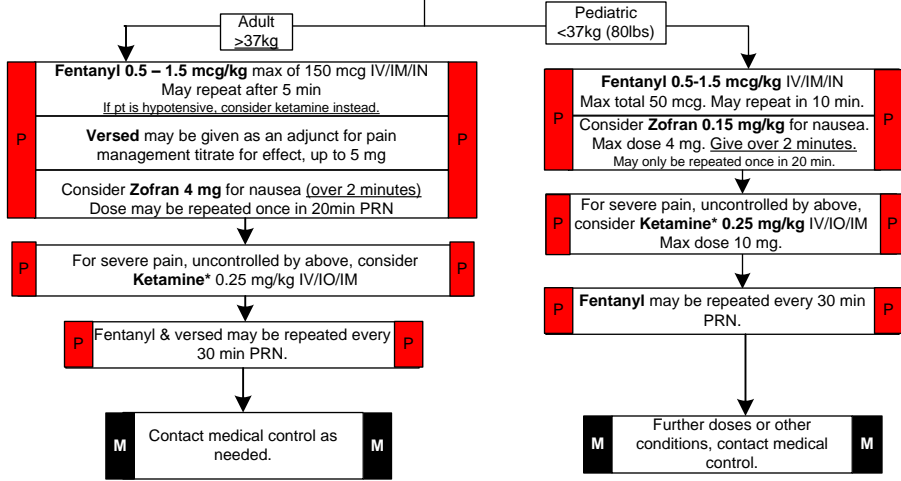
## Documenting Refusal Checklist to ensure proper documentation:

- **Oriented to person, place, time, and event**
  
- **Patient is able to speak clearly and understandably in complete sentences.**
  - No altered mental status
  - No slurred speech
  - No repetitive questions or comments
  - No alcohol or drug ingestion that appears to be hindering thought process
  
- **Patient was advised of marked points on refusal form.**
  - Our evaluation does not substitute that of a doctor's
  - Your condition may not seem as bad to you as it actually is (explain possible consequences, including death)
  - You can obtain treatment by calling your doctor or going to any emergency department
  - Do not hesitate to call us back (911)
  - Don't wait! It is usually better to get medical treatment right away
  
- **Patient verbalized his/her understanding of condition and consequences of refusal.**
  
- **Patient demonstrated ability to care for his/her self. OR**
  - Left with caretaker or family member
  - Was in custody of law enforcement
  - Family/friend was driving patient to medical care in POV

<p>History:</p> <ul style="list-style-type: none"> <li>• Age</li> <li>• Location</li> <li>• Duration</li> <li>• Past Medical History</li> <li>• Medications</li> <li>• Drug allergies</li> <li>• Medications taken prior to arrival</li> <li>• Weight</li> </ul>	<p>Signs and Symptoms:</p> <ul style="list-style-type: none"> <li>• Onset</li> <li>• Severity (pain scale)</li> <li>• Quality</li> <li>• Radiation</li> <li>• Relation to movement, respiration</li> <li>• Increased with palpation of area.</li> </ul>	<p>Differential:</p> <ul style="list-style-type: none"> <li>• Per the specific protocol</li> <li>• Musculoskeletal</li> <li>• Visceral (abdominal)</li> <li>• Cardiac</li> <li>• Pleural / Respiratory</li> <li>• Neurogenic</li> <li>• Renal (colic)</li> </ul>
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## Universal Patient Care Protocol (U2)

Patient care according to protocol based on specific complaint. Treat all underlying causes of pain appropriately. This can include positioning, ice packs, splinting and padding.



**Pearls:**

- Pain severity is a vital sign to be recorded pre and post medication delivery. Use Wong-Baker faces pain scale (A3)
- Patients >60 yrs or with liver disease, should receive smaller doses of Fentanyl.
- Vital signs should be obtained before and after giving medications.
- Watch closely for respiratory depression with narcotics. Refer to airway protocol if needed and keep naloxone available.
- Monitor patient closely for over sedation - refer to overdose protocol if needed
- Patients receiving pain management must have SpO2 monitoring.
- Patients with muscle spasms may benefit more from Versed than Fentanyl
- Maintain awareness of drug seeking behavior. Care plans should be followed when available.
- \*Ketamine should be diluted prior to IV administration.
- **Use caution in the elderly when utilizing narcotic and benzo together as it can cause delayed over sedation.**

## Universal Patient Care Protocol (U2)

Follow protocol that best treats the pt's specific complaint.

### Time/Distance Factors:

- Transport to a level II trauma center is >15 minutes by ground
- Transport to a hospital by ground is greater than transport to hospital by helicopter (time setting up landing zone & handing off patient care must be factored in)
- Extrication time >20 minutes

### Clinical Conditions:

- Pt meets trauma alert criteria including, but not limited to:
  - Penetrating injuries to head, neck, torso & extremities proximal to elbow & knee
  - Flail chest
  - Combination trauma & burns
  - Two or more proximal long bone fractures
  - Pelvic fractures
  - Open & depressed skull fractures
  - Paralysis
  - Amputation proximal to wrist or ankle
  - Major burns >20% or involving face, airway, hands, feet or genitalia
- Pediatric cardiac arrest
- STEMI confirmed
- Stroke patient that meets tPA guidelines

Patient has a time/distance factor **AND** at least one clinical condition?  
 Or  
 Are there more patients than ground ambulances can effectively transport?  
 Or  
 Is access to the patient by ground is difficult or impossible?

Yes

No

Call for AirMed through Sanford at 800-437-6886

To report landing zone &/or pt information to AirMed call them on VMed 28

AirMed not indicated. Maintain communication between BLS & ALS services as needed.

### Pearls:

- Occasionally, medical patients require time sensitive treatment. May request the helicopter if: "set up landing zone + hand off pt care + transport time" is **less than** "load and go" scenario. Rapid HC transport must also significantly improve pt outcome.
- If ground transport to a local hospital is faster than a scene flight AirMed may still be requested to respond to the hospital. This must be communicated and coordinated with hospital personnel.
- AirMed does not "standby" but will start the flight once flight conditions have been cleared.
- The helicopter may be cancelled at any time, even if on scene, if the patient condition doesn't warrant flight service.
- If the first units on scene believe that helicopter transport is not indicated, they should contact the responding ALS ambulance for consultation. The ALS ambulance will then be responsible for cancelling AirMed as needed. If an ALS ambulance is not responding, then highest medically trained provider will make the decision to cancel AirMed.

**Standard:**

The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care.

**Purpose:**

This standard is established to identify a chain of command for providers when dealing with physicians on scene and to assure the patient receives the maximum benefit of appropriate physician resources.

**Application:**

- If the patient's physician is present and wishes to assume responsibility for the patient's care:
  - The paramedic should refer to the orders of the personal Physician as long as those orders are appropriate, and do not conflict with ALS medical protocols. Paramedics should contact medical control any time they are uncomfortable with carrying out the orders from the patient's personal Physician
  - Orders given by the personal physician should be written, signed by the patient's attending physician and then attached to the PCR. If the attending physician orders medication he/she must sign a prescription form for the medication.
  - The paramedic should contact medical control physician during transport to report treatment given and obtain further orders if the personal physician does not accompany the patient.
  
- If our Medical Director, a physician with emergency care experience, or any other intervening physician is present and wishes to assume responsibility for the patient's care, the same guidelines apply as in number one above. If a physician wishes to assume responsibility for the patient when no radio medical control exists, paramedic should relinquish responsibility for patient management if the physician agrees to:
  - Show appropriate identification (or is personally known by the paramedics) and agrees in advance to accompany the patient to the hospital. He or she must sign the PCR for assuming responsibility
  - If communications are available on scene, the intervening physician is allowed and encouraged to communicate with online medical control. If there is a disagreement between the two physicians, the paramedic will follow the orders of the medical control physician.
  - In the case of multiple intervening physicians on scene, the paramedics should request that the physicians designate one physician to direct the patient care.
  
- An intervening physician not wishing to assume responsibility for the care and accompanying the patient to the hospital may be asked to assist the paramedics and/or act as a medical consultant to them and to the medical control physician.

# Criteria for Terminating or Withholding Resuscitation in Pre-hospital Cardiopulmonary Arrest

U11a

## Standard:

Define the parameters in which providers may withhold or terminate resuscitative efforts in the pre-hospital setting.

## Purpose:

**Withhold CPR and ALS treatment only if the patient meets the following criteria:**

- Rigor mortis and/or dependent lividity
- Decomposition
- Decapitation
- Hemitorporectomy (lower half of body has been traumatically amputated)
- Completely charred body without detectable signs of life
- Obviously blunt or penetrating trauma incompatible with life
- Fetal death with a fetus < 20 weeks by best age determination available at scene.(considered products of conception and does not require time of death)
- A valid Do Not Resuscitate Form or physician order that directs no resuscitation

Indications for terminating resuscitation efforts: **Must contact medical control prior to termination**

M

- Blunt or Penetrating Trauma without obvious injury incompatible with life
  1. If witnessed arrest, resuscitation should be attempted following protocol T7 until ROSC or at least 15 minutes of unsuccessful resuscitation.
  2. Consider termination of resuscitation efforts trauma patients with 15 minutes of unsuccessful resuscitation
  3. Medical control must be contacted before terminating resuscitation efforts
- No evidence of trauma (presumed medical arrest) and:
  1. No return of spontaneous pulse or respirations after 15 minutes of CPR and an EtCO<sub>2</sub> that remains <10. Pt demonstrating a sustained rise in EtCO<sub>2</sub> may require continued care and cases should be discussed with a physician.
  2. Patient remains in asystole after successful intubation/King Airway and initial medications following current AHA ACLS guidelines, with no reversible causes identified.
  3. Contact medical control.
- Code level II when CPR has been initiated
  1. Any time BLS care has been started (by a healthcare provider), regardless of code level sheet, a physician must be contacted to terminate resuscitation.
- **Exceptions to withholding/terminating resuscitation.** Patients meeting the following criteria should be resuscitated to the maximum capability of the provider (This does not pertain to patients that fall into Section 1):
  - Drowning with submersion less than 60 minutes
  - Hypothermia
  - Patient is pregnant and suspected to be 20 weeks or later in gestation
  - Lightning strikes
  - Logistic factors should be considered (collapse in public place, family wishes, safety of crew and the public)

# Criteria for Terminating or Withholding Resuscitation in Pre-hospital Cardiopulmonary Arrest

U11b

## Additional considerations:

- A DNR can be overridden by patient, person, or physician who executed the order at any time.
- Mass casualty incidents (MCI) are not covered in this protocol. If there is more than one patient on the scene and there are not adequate resources available on the scene to treat all patients, then patients will be triaged and treated in a priority fashion.
- These guidelines apply to both adult and pediatric patients.
- Law enforcement should be contacted in all cases. If the scene is a potential crime scene EMS providers should disturb the scene as little as possible to preserve evidence
- ALS personnel should document ECG interpretation for any patient without obvious signs of death.
- Document in the PCR the specific indications for withholding resuscitation. Fetal death < 20 weeks may be documented on mothers PCR, if  $\geq 20$  weeks create separate PCR.
- If an ALS intercept has been made and efforts are terminated, the patient should be transported to the nearest hospital. The medical control physician can pronounce the patient dead and the patient can then be transported to a funeral home. This is to prevent EMS crews having to stop during the intercept to notify the patient's family during the call.
- **If you are unsure whether the patient meets the above criteria, resuscitate.**



**Standard:**

- Prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care per the patient condition.

**Indications:**

- A patient assessed by an ALS provider who determines that ALS treatment is not needed or anticipated to be needed.

**Contraindications:**

- Any patient deemed to benefit from, but refuses specific ALS care (IV, medications) should still be cared for by the ALS provider in case the patient changes their mind.
- Any patient that previously received ALS intervention within the call for service must continue to be cared for by the paramedic.

**Procedure:**

- If a BLS crew arrives on scene prior to the ALS crew arrival:
  - BLS provider performs an assessment of the patient in accordance with protocols.
  - ALS may be cancelled if the patient does not fall into a category where ALS care may be warranted.
- When ALS & BLS have arrived at the patient:
  - BLS provider will give a verbal patient report to the ALS provider.
  - ALS provider will assess the patient and determine if ALS care is needed or may be anticipated to be needed. The ALS provider must complete a PCR documenting his/her assessment for every patient assessed except when triaging patients in a multi-casualty incident.
  - If all providers agree that the patient does not require, or is refusing, ALS care, the paramedic will contact medical control prior to handing over patient care to the BLS provider.
  - The ALS provider will provide the BLS provider with any updated information prior to leaving the scene.
  - The ALS provider must complete a PCR documenting his/her assessment for every patient assessed except when triaging patients in a multi-casualty incident.
- If a BLS ambulance is transporting two patients and requests an ALS intercept for one of them:
  - When the ALS patient is stabilized, the BLS provider will provide a brief report on the second patient. An ALS assessment will be performed as necessary.
  - The paramedic will assist the BLS provider in any way necessary for the BLS patient. Triage resources may be necessary.
  - The paramedic will complete an abbreviated PCR listing any assessments, complaints, injuries, interventions noted. The PCR will also state that the patients were triaged and BLS was the primary care provider for this patient during transport.
  -

**Notes:**

- When the number of patients exceeds the number of ALS providers, the ALS provider(s) must triage the patients that require ALS care, and may not have the resources to evaluate all patients directly.

## Purpose:

In order to assure patients are transported to appropriate receiving hospitals in an efficient and timely manner.

## Application:

- Hospital Destination

The Fargo Veterans Affairs Health Care System (FVAHCS) will accept emergency ambulance patients to its facility 24 hours a day, 7 days a week. While most patients are suitable for evaluation in the Emergency Department, the FVAHCS does not have the resources to manage the following patients, and they should NOT be transported to the FVAHCS:

- Patients that are deemed to be exhibiting signs and symptoms of an acute cardiac event (This also includes patients that are ischemic, hyper/hypotensive or tachy/bradycardic that remain unstable after initial treatment.)
- Major trauma patients (Call VA ED to discuss patients with low acuity minor trauma)
- Patients in cardiac or respiratory arrest (or imminent arrest)
- Patients that may require neurosurgery
- Obstetric patients or potentially unstable GYN patients
- Pediatric patients (<17yo unless patient is, or has been, active duty military)
- Major burns (>10% BSA, face, airway, perineum or major joint)
- Signs/symptoms of acute stroke that are within current treatment time limits

- FVAHCS Diversion

In the event the FVAHCS has determined that their internal criteria for diversion have been met, the facility will close to emergency ambulance patients.

- In the event the FVAHCS goes on diversion they will contact F-M Ambulance Service dispatch and notify the dispatcher of:
  1. Start time/day of diversion
  2. End time/day of diversion
- The dispatcher will:
  1. Immediately notify all on duty crews and the leadership member on duty.
  2. Document the dates and or times of the diversion.
- Crews will document the reason why a patient is diverted from the FVAHCS in their narrative.
  1. If it is a specific patient, not a facility-wide diversion, they will also document the name of the FVAHCS staff person requesting diversion or the specific exclusion criteria (listed above) that pertains to the situation.
  2. Crews will also mark "Diversion" in the ePCR under "Transported Due To."

- Miscellaneous Considerations

Ambulance crews transporting to the FVAHCS:

- Should call in a patient report via radio.
- Will not need to seek approval to transport.
- May request advice or orders from the on duty physician. This may be done via radio or by calling 701-239-3700 then 93136 to reach the Emergency Department.

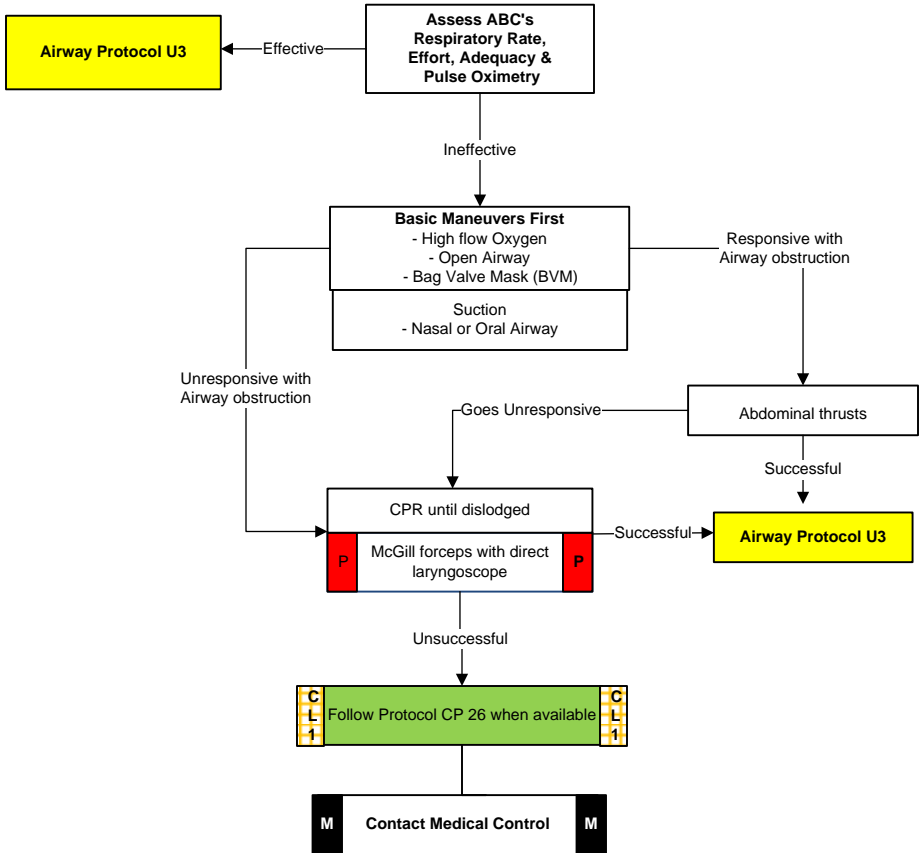
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# Medical Protocols

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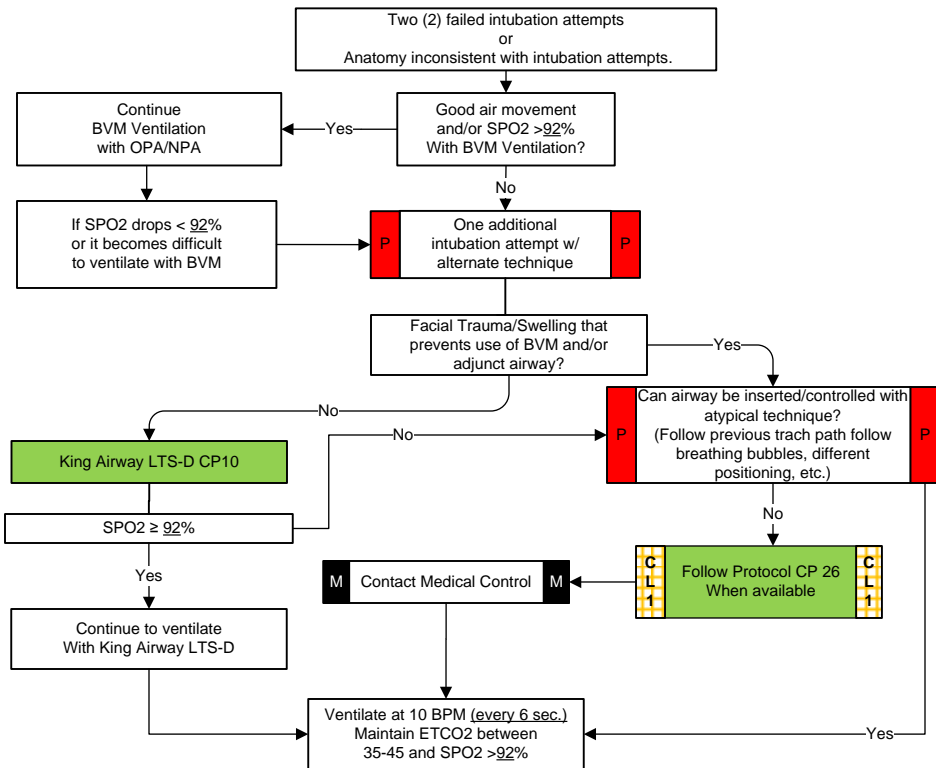
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For purposes of these protocols, adult patients are defined as greater than 37kg  
(approx 80lbs)



## Pearls:

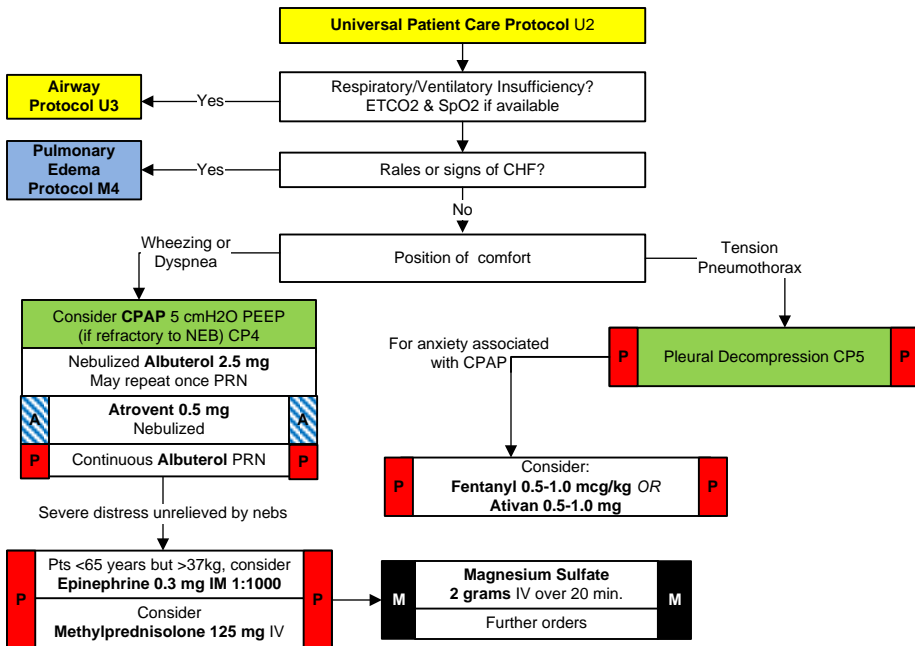
- This protocol is only for use in patients >1 year of age.
- Suction applied for > 10 seconds may cause hypoxia and dysrhythmias.
- Be prepared for vomiting following removal of obstruction.
- Do not intervene in patients with a partial airway obstruction with good air exchange.



## Pearls

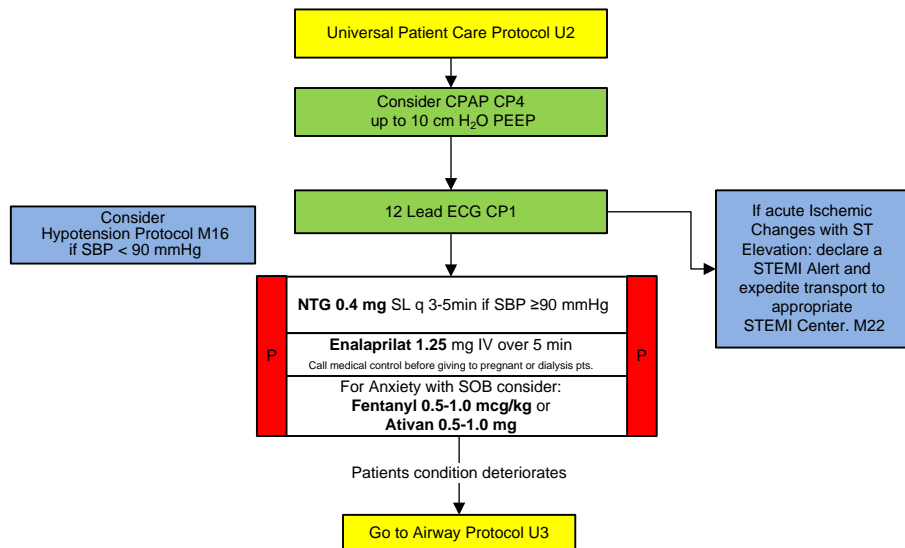
- Continuous Capnography (EtCO<sub>2</sub>) is required (if available) with all King Airway LTS-D, Endotracheal Intubations & Surgical Airways. EtCO<sub>2</sub> should be kept between 35-45. Document results in PCR.
- If an airway is being maintained by BVM with SpO<sub>2</sub> >92%, it is acceptable to maintain basic airway measures instead of using a King Airway LTS-D or ET.
- If a King Airway LTS-D is providing good ventilatory exchange and is functioning appropriately: DO NOT REMOVE or EXCHANGE.
- An advanced procedure form is required on all patients with a King Airway LTS-D or intubation.
- Maintain c-spine in those patients with suspected spinal injury.
- If intubation is difficult or first intubation attempt fails, make an adjustment and try again:
  - Different laryngoscope blade
  - Change head positioning
  - Different ETT size
  - Consider applying BURP maneuver
  - King Vision (video laryngoscopy)
  - Two-handed intubation
- Continuous pulse oximetry should be used and documented.
- Notify Medical Control ASAP regarding patient's difficult or failed intubation.

History:	Signs & Symptoms:	Differential:
<ul style="list-style-type: none"> <li>Asthma; COPD – chronic bronchitis, emphysema, congestive heart failure</li> <li>Home treatment (oxygen, nebulizer)</li> <li>Medications (theophylline, steroids, inhalers)</li> <li>Toxic exposure, smoke inhalation.</li> </ul>	<ul style="list-style-type: none"> <li>Shortness of breath</li> <li>Pursed lip breathing</li> <li>Decreased ability to speak</li> <li>Increased respiratory rate and effort</li> <li>Wheezing, rhonchi, rales, stridor</li> <li>Use of accessory muscles</li> <li>Fever, cough</li> <li>Tachycardia</li> <li>Orthopnea (shortness of breath lying down)</li> </ul>	<ul style="list-style-type: none"> <li>Asthma/COPD (Emphysema, Bronchitis)</li> <li>Anaphylaxis</li> <li>Aspiration</li> <li>Pleural effusion</li> <li>Pneumonia</li> <li>Pulmonary embolus</li> <li>Pneumothorax</li> <li>Cardiac (MI or CHF)</li> <li>Pericardial tamponade</li> <li>Hyperventilation</li> <li>Inhaled toxin (Carbon monoxide, etc.)</li> </ul>

**Pearls:**

- ETCO<sub>2</sub> & SpO<sub>2</sub> must be monitored continuously if initial saturation is less than 92%, or there is a decline in patient's status despite normal pulse oximetry readings.
- Respiratory distress with signs and symptoms that could have a cardiac origin obtain a 12 lead ECG.
- Epinephrine may precipitate cardiac ischemia. A 12-lead ECG must be performed on these patients.**
- Consider contacting Medical Control if patient is refractory to therapy.
- A silent chest in respiratory distress or a rising EtCO<sub>2</sub> is a pre-respiratory arrest sign
- Carefully assess patient to ensure anxiety is related to CPAP & not due to hypoxia prior to medicating with **Ativan** or **Fentanyl**.

<p><b>History:</b></p> <ul style="list-style-type: none"> <li>• Congestive heart failure</li> <li>• Past medical history</li> <li>• Medications (digoxin, lasix)</li> <li>• Viagra, Levitra, Cialis</li> <li>• Cardiac history --past myocardial infarction</li> </ul>	<p><b>Signs &amp; Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Respiratory distress, bilateral rales</li> <li>• Apprehension, orthopnea</li> <li>• Jugular vein distention</li> <li>• Pink, frothy sputum</li> <li>• Peripheral edema, diaphoresis</li> <li>• Hypotension, shock</li> <li>• Chest pain</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Myocardial infarction</li> <li>• Congestive heart failure</li> <li>• Asthma</li> <li>• Anaphylaxis</li> <li>• Aspiration</li> <li>• COPD</li> <li>• Pleural effusion</li> <li>• Pneumonia</li> <li>• Pulmonary embolus</li> <li>• Pericardial tamponade</li> <li>• Toxic Exposure</li> </ul>
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### Pearls

- Avoid **Nitroglycerin** in any patient who has used Viagra or Levitra in the past 24 hours or Cialis in the past 48 hours due to possible severe hypotension.
- Careful monitoring of level of consciousness, BP, and respiratory status with above interventions is essential.
- Consider myocardial infarction in all these patients. If suspected give ASA.
- Allow the patient to be in their position of comfort to maximize their breathing effort.
- Do not give **Enalaprilat** to patient's that had angioedema due to an ACE inhibitor.



## Airway Protocol U3

## Basic Maneuvers First:

- Open Airway with supplemental 100% oxygen via non-rebreather and use NC @ 15 lpm to increase FIO2
- Avoid positive pressure ventilation if possible
- Nasal or Oral Airway

**M** Notify Destination of RSI **M**  
Contact Medical Control as needed **M**

If pt continues to fight airway despite adequate sedation, consider long term neuromuscular block.

**Vecuronium 0.1 mg/kg**

If used as initial agent, maintenance dose is **0.05mg/kg**

OR

**Rocuronium 1 mg/kg**

If used as initial agent, maintenance dose **0.2 mg/kg**

**Maintain Sedation:** Watch for signs of discomfort (tachycardia, tearing) throughout patient care

Refer to protocol U3 for dosing

**For hypersecretion post ketamine use:**  
Consider **Atropine 0.3 mg IV/IO**

**Bradycardic?**  
**Atropine 1.0 mg**

**Increased ICP?**  
**Fentanyl 3 mcg/kg**

Should be given 3 min prior to intubation.

**Sedate – Choose one:**  
**Etomidate 0.3 mg/kg**  
**Versed 0.1 mg/kg**  
**Ketamine 2 mg/kg**

Ketamine preferred for hypotension or hypovolemia  
Do NOT use Ketamine for STEMI or CHF patients.

**Administer Oxygen**

BVM

Maintain Pulse Ox  $>92\%$  and EtCO2 35-45

**Paralyze – Choose one:**  
**Succinylcholine 2.0 mg/kg**  
(rapid, short term)

**Vecuronium 0.1 mg/kg IV/IO**

**Rocuronium 1.0 mg/kg IV/IO**

**Direct Laryngoscopy** CP11 or 20

Have King Airway accessible

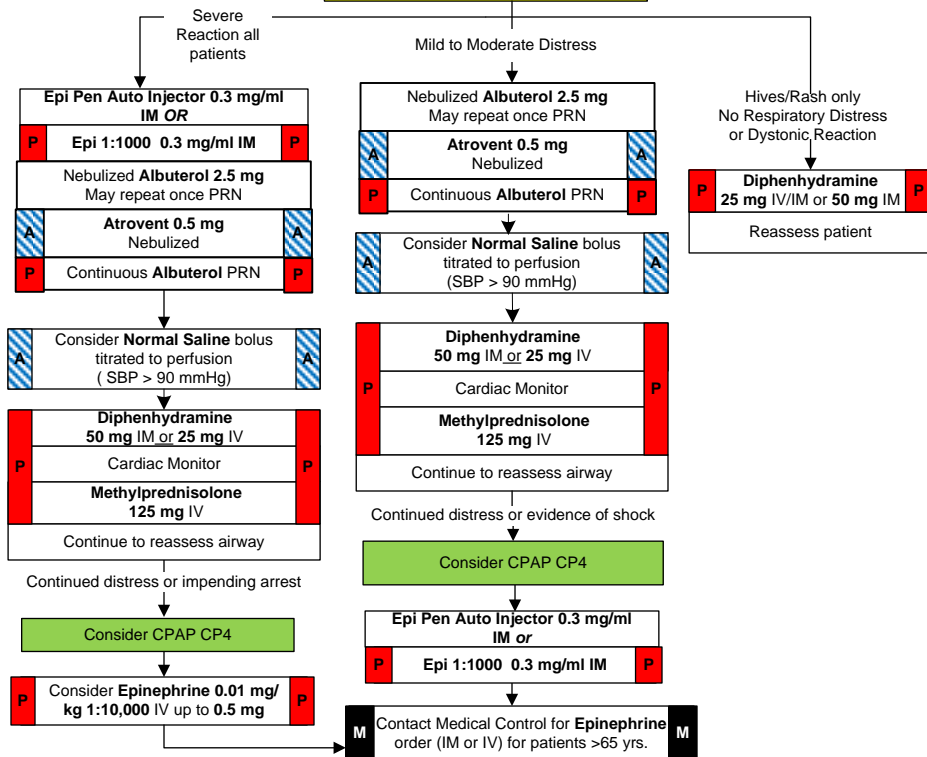
Consider OG tube CP9

## Pearls:

- **RSI approved Paramedics ONLY**
- **Use reference card provided in RSI tray.**
- A sedative **must** be given prior to a paralytic medication. (Because of drug onset times, **vecuronium** may be given 1-2 min prior to **Etomidate** to achieve the appropriate sedation for patient.)
- **Succinylcholine** is a short acting paralytic. Do not use **Succinylcholine** in crush injuries or burns (>72 hours old), history of malignant hyperthermia, hyperkalemia, ALS, neuromuscular disease, myasthenia gravis. Do not use more than once
- **Continuous** capnography (EtCO2) is mandatory with all methods of intubation. Document results.
- If an effective airway is being maintained by BVM with continuous pulse oximetry values of  $>92\%$ , it is acceptable to continue with basic airway measures instead of Intubation.
- For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation & ventilation.
- An intubation attempt is when the tube passes the plane of the teeth or King Vision tip.
- Ventilatory rate should be age appropriate to maintain a EtCO2 between 35 and 45. Avoid hyperventilation.
- Maintain C-spine immobilization for patients with suspected spinal injury.
- If difficult intubation is anticipated consider early use of King LTS-D, King Vision, Bougie, two handed intubation or BURP maneuver. (CP11, 12, 20)
- If an intubation attempt fails CHANGE something: different blade, smaller tube size, or use adjunctive maneuver.
- Complete Advanced Procedure Form with physician signature.
- Second dosage of **Vecuronium** or **Rocuronium** isn't usually needed for 45 minutes.
- Patients weighing 70-120kg may receive a **20 mg** dose of **Etomidate** & **200 mg** dose of **succinylcholine**.

History	Signs & Symptoms	Differential
<ul style="list-style-type: none"> <li>Medication history</li> <li>Onset and location</li> <li>Past medical history</li> <li>Past history of reactions</li> <li>New clothing, soap, detergent</li> <li>Medication allergy / exposure</li> <li>Food allergy / exposure</li> <li>Insect sting or bite</li> </ul>	<ul style="list-style-type: none"> <li>Edema / Voice Changes</li> <li>Itching or hives</li> <li>Coughing / wheezing or respiratory distress</li> <li>Chest or throat constriction</li> <li>Difficulty swallowing</li> <li>Hypotension or shock</li> </ul>	<ul style="list-style-type: none"> <li>Urticaria (rash only)</li> <li>Anaphylaxis (systemic effect)</li> <li>Shock (vascular effect)</li> <li>Angioedema (drug induced)</li> <li>Aspiration / Airway obstruction</li> <li>Vasovagal event</li> <li>CHF</li> <li>Asthma or COPD</li> </ul>

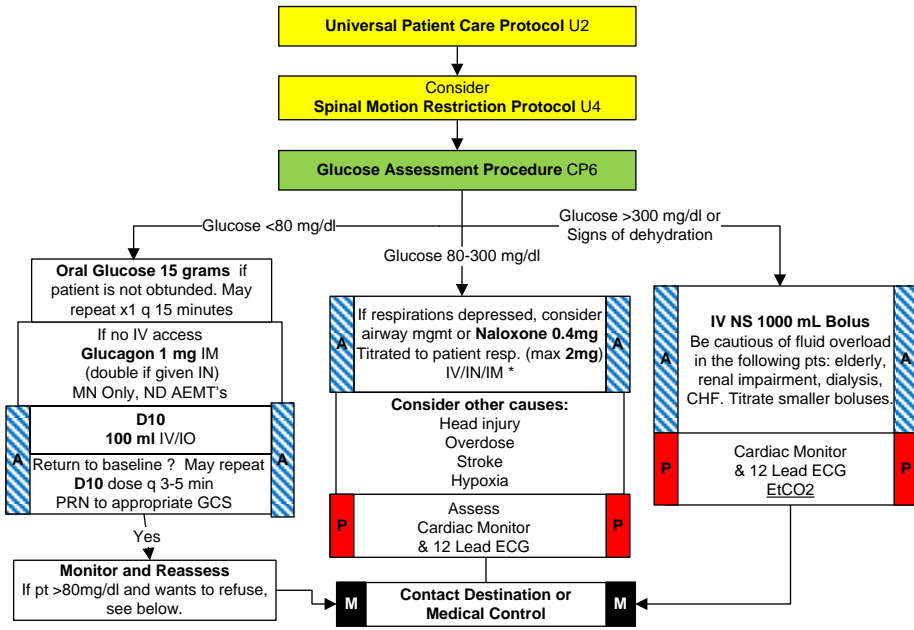
## Universal Patient Care Protocol U2



### Pearls:

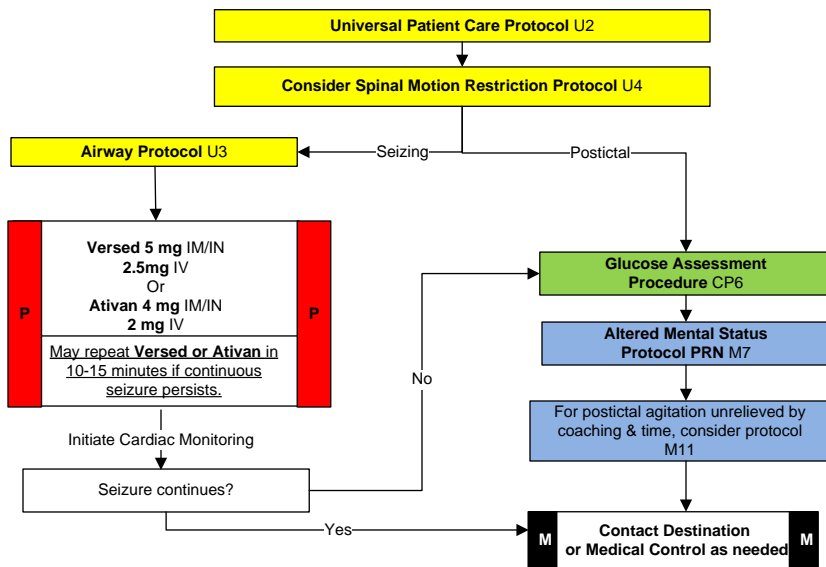
- Any patient with respiratory symptoms or extensive reaction should receive IV or IM **Diphenhydramine**.
- The shorter the onset from exposure to symptoms, the more severe the reaction.
- Cold pack to bite or sting site.
- Consider albuterol nebulizer for shortness of breath even without wheezing
- For mild to severe reactions be prepared to intubate.
- Severe reactions are considered reactions with hypotension, impending respiratory or cardiac arrest.

<p><b>History:</b>                  Known diabetic, medic alert tag                  Drugs, drug paraphernalia                  Report of illicit drug use or toxic ingestion                  Past medical history                  Medications                  History of trauma                  Change in condition</p>	<p><b>Signs/Symptoms:</b>                  Decreased mental status                  Change in baseline mental status                  Bizarre behavior                  Hypoglycemia (cool, diaphoretic skin)                  Hyperglycemia (warm, dry skin; fruity breath; Kussmaul resp; signs of dehydration)</p>	<p><b>Differential:</b>                  Head trauma                  CNS (stroke, tumor, seizure, infection)                  Cardiac (MI, CHF)                  Infection                  Thyroid (hyper / hypo)                  Shock (septic, metabolic, traumatic)                  Diabetes (hyper / hypoglycemia)                  Toxicologic, CO poisoning                  Acidosis / Alkalosis                  Environmental exposure                  Pulmonary (Hypoxia)                  Electrolyte abnormality</p>
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- Pearls:**
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety, call Local Fire Department to assess CO levels.
  - It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after **D10** or **Glucagon**.
  - **EtCO2** should be used for BGL >300 mg/dl.
  - **Glucagon** may be ineffective if hypoglycemia has persisted for a significant amount of time, or in liver disease or kids.
  - Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia.
  - Hyperglycemia is treated w/fluids. These patients are volume depleted, glucose will begin to clear w/adequate hydration.
  - Patients on oral hypoglycemics or long-acting insulin are at risk for repeat episodes of hypoglycemia, monitor closely and encourage transport.
  - If hypoglycemic patients have returned to baseline, glucose is >80 mg/dl and they refuse transport, make certain that the patient eats and that there is someone to observe them for repeat hypoglycemic episodes.
- \* AEMTs can only give **Naloxone** IN. IN is a safer delivery method of **Naloxone** than IM.

<b>History:</b> Reported / witnessed seizure activity Previous seizure history Medical alert tag information Seizure medications History of trauma History of diabetes History of pregnancy Substance Abuse CVA Tumor HTN	<b>Signs and Symptoms:</b> Febrile or Flushed Tonic Phase: body stiffening Clonic Phase: body jerking Decreased mental status Sleepiness Incontinence Observed seizure activity Evidence of trauma Unconscious	<b>Differential:</b> CNS (Head) trauma Tumor Metabolic, Hepatic, or Renal failure Hypoxia Electrolyte abnormality (Na, Ca, Mg, K+) Drugs, Medications, Non-compliance Infection / Fever Alcohol withdrawal Eclampsia Stroke Hyperthermia Hypoglycemia
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**Pearls:**

- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- If no known history of seizures, transport should not be delayed. This is also true for a patient who does not become oriented within a respectable time frame after seizures.
- Realize that there are more than just grand mal seizures. Thoroughly document what activity/behavior is observed and what body area is effected.
- Assess possibility of occult trauma and substance abuse.
- Be prepared to assist ventilations especially if **Versed** or **Ativan** is used.
- For any seizure in a pregnant or recently post partum patient, follow the **OB Emergencies Protocol (M21)**.
- **Versed** is to be titrated to effect with SBP >100 mmHg or peripheral pulses present.

<p><b>History:</b>                  Previous CVA, TIAs                  Previous cardiac / vascular surgery                  Associated diseases: diabetes, hypertension, CAD                  Atrial fibrillation                  Medications (blood thinners)                  History of trauma                  DNR/Code status</p>	<p><b>Signs and Symptoms:</b>                  Altered mental status                  Weakness / Paralysis                  Sudden vision changes                  Acute vision changes                  Aphasia / Dysarthria                  Syncope                  Vertigo / Dizziness                  Vomiting                  Headache                  Seizures                  Respiratory pattern change                  Hypertension / hypotension                  Sudden confusion</p>	<p><b>Differential:</b>                  Altered Mental Status                  TIA (Transient ischemic attack)                  Seizure                  Hypoglycemia                  Hypoxia/Hypercarbia                  Stroke                  Thrombotic/Embolus (85%)                  Hemorrhagic (15%)                  Tumor                  Trauma</p>
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Universal Patient Care Protocol (U2)

Cincinnati Pre-Hospital Stroke Screen A4  
 Glucose Assessment Procedure CP6

Positive stroke screen & Glucose >80

Negative stroke screen, seizure at onset Or Glucose of <80

Establish last known well time  
 Complete tPA Checklist A5

Support patient's signs & symptoms. Consider other protocols as needed such as:  
 Altered Mental Status M7  
 Seizure M8

Give radio report early stating, "Stroke symptoms with last known well time of \_\_\_\_."  
 Also include whether pt has any tPA exclusion criteria (A5).

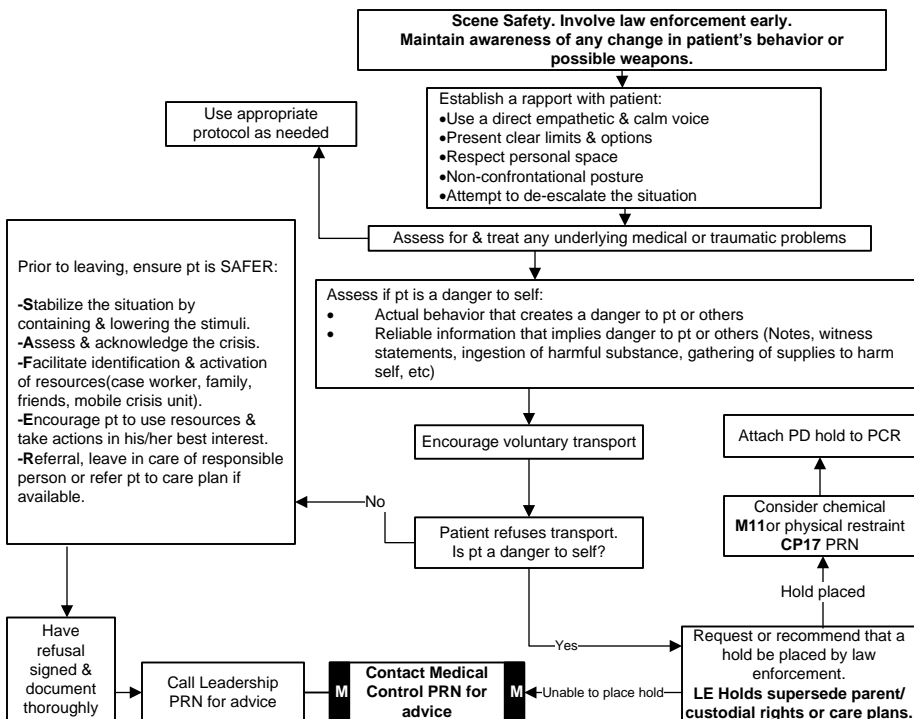
Consider emergent transport if patient is unstable or emergent transport will significantly impact pt receiving a time-sensitive treatment.  
 Contact receiving facility early to determine if pt would benefit from diversion to a stroke center.

12 Lead ECG CP1  
 Establish IV  
 (2 large bore if possible, at least 1 should be 18ga in AC)

**Pearls:**

- **Last known well time** is defined as the last time the patient was seen symptom free (i.e. awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom free).
- **Symptom onset time** is when a sudden change occurs and the patient can tell you exactly when the symptoms started.
- It is important to establish a time frame with either of the above times & clearly document & report to receiving facility.
- Each stroke center has its own treatment guidelines. They will determine whether the patient meets their alert criteria based on EMS radio report.
- Whenever possible, a family member should accompany the patient to the hospital to provide a detailed history. If unavailable, try to obtain a name and number where the hospital can reach family.
- The differentials listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting).
- Hypoglycemia can present as a localized neurological deficit, especially in the elderly.
- Scene times should be kept to a minimum.
- This protocol applies to both ischemic and hemorrhagic stroke patients.

<p><b>History</b></p> <ul style="list-style-type: none"> <li>• Situational crisis</li> <li>• Psychiatric illness/medications</li> <li>• Injury to self or threats to others</li> <li>• Medic alert tag</li> <li>• Substance abuse / overdose</li> <li>• Diabetes</li> </ul>	<p><b>Signs &amp; Symptoms</b></p> <ul style="list-style-type: none"> <li>• Anxiety, agitation, confusion</li> <li>• Affect change, hallucinations</li> <li>• Delusional thoughts, bizarre behavior</li> <li>• Combative violent</li> <li>• Expression of suicidal/homicidal thoughts</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• See Altered Mental Status differential</li> <li>• Hypoxia</li> <li>• Alcohol Intoxication</li> <li>• Toxin / Substance abuse</li> <li>• Medication effect / overdose</li> <li>• Withdrawal syndromes</li> <li>• Depression</li> <li>• Bipolar (manic-depressive)</li> <li>• Schizophrenia, anxiety disorders, etc</li> </ul>
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**Pearls:**

- Consider your safety first. Physical restraint should be preformed/assisted by Law Enforcement when available.
- Do not allow the patient to come between you and the exit.
- Do not overlook the possibility of associated domestic violence or child abuse.
- Restrained patients should never be maintained or transported in a prone position.
- Mobile Mental Health Crisis Units can be reached at 800-223-4512 for MN patients and 701-298-4500 and ask for "SE on call" or "Mobile Mental Health crisis team" ND patients.

## History

- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Diabetes
- Substance abuse / overdose – pay particular attention to drugs that may precipitate excited delirium

## Signs & Symptoms

- Anxiety, agitation, confusion
- Affect change, hallucinations
- Delusional thoughts, bizarre behavior
- Combative violent
- Expression of suicidal/homicidal thoughts

## Differential:

- See Altered Mental Status differential
- Hypoxia
- Alcohol Intoxication
- Toxin / Substance abuse
- Medication effect / overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia, anxiety disorders, etc

**Consider Protocols:**  
**Overdose M12**  
**Head Trauma T3**  
**Cardiac Arrest M27**

Psychiatric BLS protocol M10

Restraint Procedure if needed CP17

Blood Glucose < 80 mg/dl

Altered Mental Status Protocol M7

## Possible Excited Delirium:

- Consider **1000ml fluid bolus** (max 2L)
- If temp >101° refer to **M14**
- If cardiac arrest, consider another fluid bolus & call medical control about giving **sodium bicarbonate** early.

De-escalation skills unsuccessful?

Severe Agitation

Mild agitation  
Choose one path

**Zyprexa**  
5-10 mg IM OR  
**Ketamine 250 mg IM**  
 may repeat x1 if necessary in 5 min

**Zyprexa 5 mg IM**

**Ativan 1-2 mg IV/IN/IM** or  
**Versed 2.5 mg IV/IN/IM**  
 May repeat x1 after 10 min  
 May consider  
**Diphenhydramine 50 mg IM 25 mg IV**

Emergency Reaction

Laryngospasm

Hypersecretion

**Versed 2.5mg**  
IV/IN/IM  
May repeat once

Consider **Atropine 0.3 mg IV/IO**

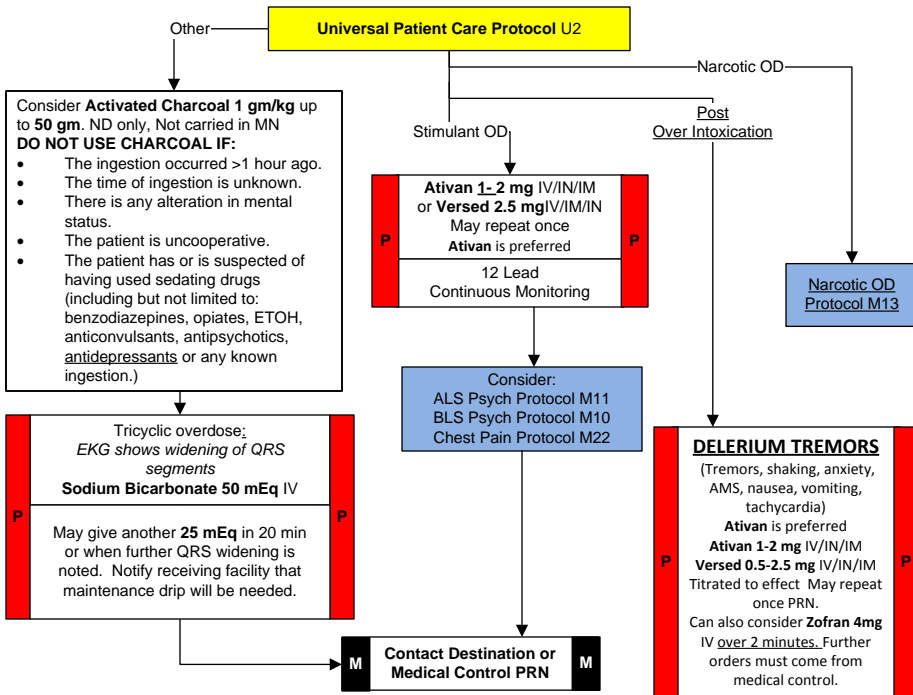
Continuous ETCO<sub>2</sub>, SpO<sub>2</sub>,  
Cardiac Monitor  
**Contact Destination or Medical Control PRN**

Quickly move to M5 protocol w/IO & Bougie

## Pearls:

- Consider your safety first. Physical restraint should be performed/assisted by Law Enforcement when available. Do not allow the pt to come between you and the exit.
- Consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- Do not overlook the possibility of associated domestic violence or child abuse.
- All patients who receive chemical restraint must be continuously observed by ALS personnel. If possible and when safe to do so ECG, ETCO<sub>2</sub>, SpO<sub>2</sub>, Blood Glucose.
- Any transported patient who is handcuffed or restrained by Law Enforcement should be accompanied by an officer whenever possible. If not possible law enforcement must be immediately available.
- Restrained patients should never be maintained or transported in a prone position.
- Contact medical control if pediatric patient requires chemical restraint.
- Versed & Ativan should be titrated to effect w/SBP >100 or peripheral pulses present.
- Ativan may be more beneficial w/excited delirium than Versed
- After ketamine, rapidly move pt to ambulance, monitor airway closely for signs of laryngospasm (stridor, abrupt cyanosis/hypoxia) and be prepared to provide airway support.

<p><b>History:</b> Ingestion or suspected ingestion of a possibly toxic substance Substance ingested, route, quantity Time of ingestion Reason (suicidal, accidental, criminal) Available medication in home Past medical history, medications</p>	<p><b>Signs and Symptoms:</b> Mental status changes hypotension/ hypertension Decreased respiratory rate Tachycardia, dysrhythmias Seizures</p>	<p><b>Differential:</b> Tricyclic antidepressants Acetaminophen (Tylenol) Depressants Stimulants Anticholinergic Cardiac medications Solvents, alcohols, cleaning agents Insecticides (organophosphates)</p>
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**Pearls:**

- Do not rely on patient history of ingestion especially in suicide attempts.
- Tricyclic: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- Depressants: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils.
- Stimulants: increased HR, increased BP, increased temperature, dilated pupils, seizures, diaphoresis.
- Anticholinergic: increased HR, increased temperature, dilated pupils, mental status changes, dry skin.
- Cardiac Meds: dysrhythmias and mental status changes.
- Solvents: Nausea, vomiting, and mental status changes.
- Insecticides: increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
- Consider contacting the Poison Control Center 1-800-222-1222.
- DECON of Haz-Mat patients should be performed by trained personnel prior to initial patient contact or transport.

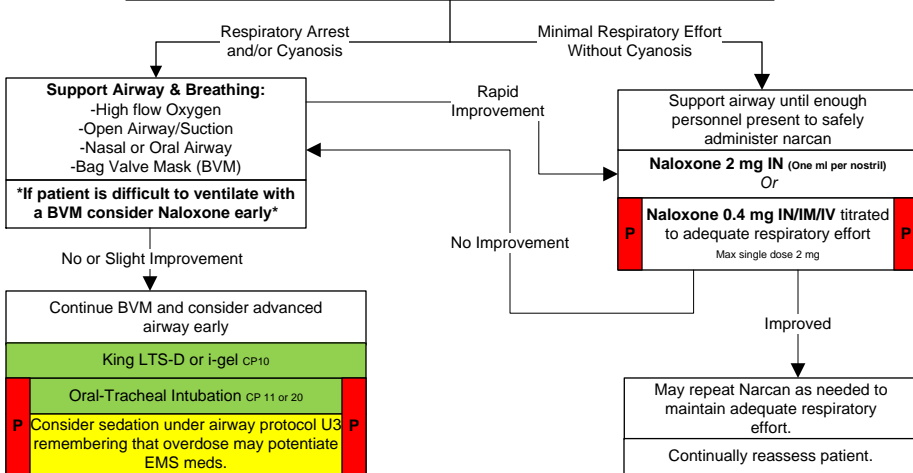


<p><b>History:</b>                  Ingestion/suspected ingestion of an opioid substance:                  *Heroin                           *Butorphanol (Stadol)                  *Codeine                           *Fentanyl                  *Hydrocodone (Vicodin)       *Hydromorphone (Dilaudid)                  *Meperidine (Demerol)       *Morphine                  *Nalbuphine (Nubain)       *Oxycodone (Percocet)                  *Propoxyphene (Darvon)       *Methadone                  *Buprenorphine (Suboxone)                  Substance ingested, route, quantity                  Time of ingestion                  Reason (suicidal, accidental, criminal)                  Available medication in home                  Past medical history, medications</p>	<p><b>Signs and Symptoms:</b>                  Respiratory Depression                  Drowsiness                  Itching                  Nausea &amp; Vomiting                  Dry Mouth                  Miosis (constricted pupils)                  Mental status changes                  Hypotension                  Seizures (particularly after withdrawal)  <b>Reason to treat w/Narcan:</b>                  Respiratory Depression                  (ineffective breathing)</p>	<p><b>Differential:</b>                  Tricyclic antidepressants                  Acetaminophen (Tylenol)                  Depressants                  Stimulants                  Anticholinergic                  Cardiac medications                  Solvents, alcohols, cleaning agents                  Insecticides                  (organophosphates)</p>
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**Universal Patient Care Protocol U2**

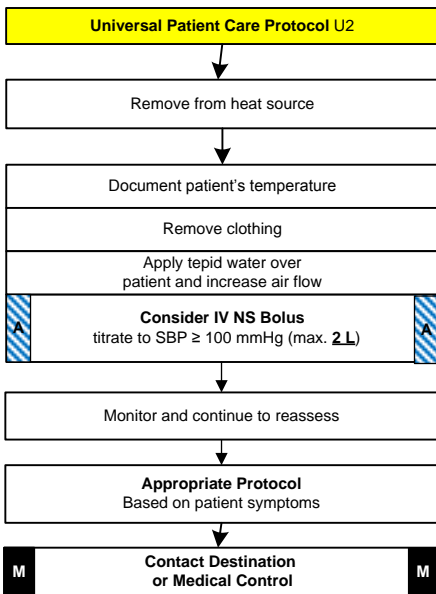
**Adequate respiration, oxygenation & ventilation must be ensured throughout care as it can change quickly in these patients.**

Stay alert to other causes of patient condition, particularly if narcan is ineffective.



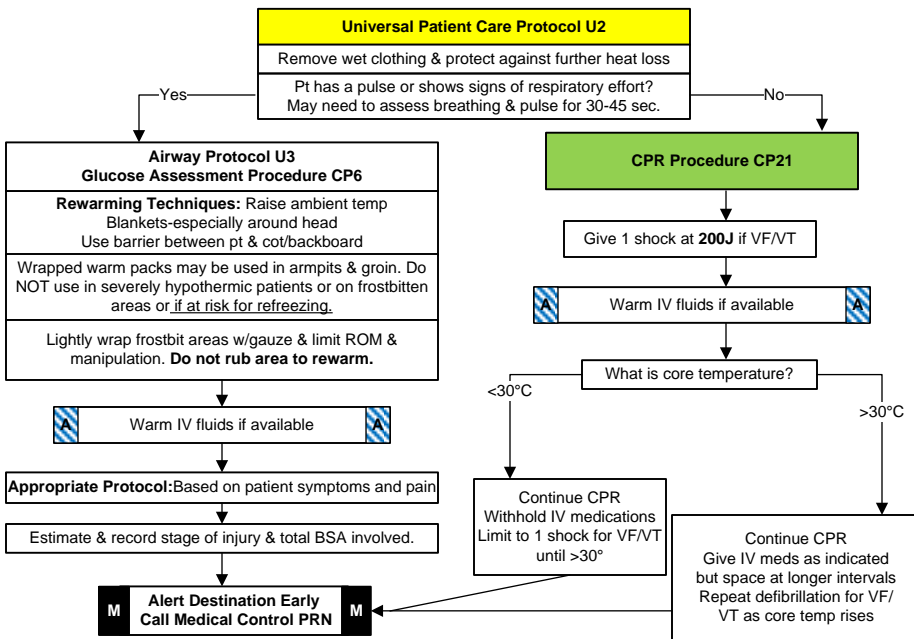
- Pearls:**
- Do not rely solely on patient history of ingestion. Pay close attention to the scene and remember illicit drugs may be mixed with unknown substances.
  - Scene safety is primary. Be careful for uncapped needles, hazardous materials and other drug paraphernalia.
  - Reversing an overdose in a chronic user may lead to serious side effects including but not limited to: withdrawals, combativeness, tachycardias, seizures, hypertension, pulmonary edema.
  - Patient who are maintaining their own airway and breathing effectively do not necessarily need naloxone and are better treated with supportive cares.
  - Naloxone only works on opioids. It is not effective with non-opioid drugs.
  - Naloxone does not work as long as most opioids. Patients need to be watched closely for return of symptoms after naloxone reversal.
  - Naloxone should not be routinely given to cardiac arrest patients.

<b>History:</b> <ul style="list-style-type: none"> <li>• Age</li> <li>• Past medical history</li> <li>• Medications</li> <li>• Exposure to environment even in normal temperatures</li> <li>• Exposure to extreme heat</li> <li>• Extreme exertion</li> <li>• Drug use</li> <li>• Fatigue/Muscle Cramping</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Altered LOC</li> <li>• Hot, Dry or sweaty skin</li> <li>• Mental status changes</li> <li>• Seizures</li> <li>• Hypotension or shock</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Fever</li> <li>• Dehydration</li> <li>• Medications</li> <li>• Hyperthyroidism (Storm)</li> <li>• Agitated Delirium</li> <li>• Heat Cramps</li> <li>• Heat exhaustion</li> <li>• Heat stroke</li> <li>• CNS Lesion</li> </ul>
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**Pearls:**

- Extremes of age are more prone to heat emergencies (i.e. young and old).
- Drugs may contribute to hyperthermia: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Intense shivering may occur as patient is cooled (treat shivering with Versed or Fentanyl as dosed in protocol U8).
- Utilize cold saline for bolus when available.
- **HEAT CRAMPS** – benign muscle cramping because of dehydration; NOT associated with an elevated temperature
- **HEAT EXHAUSTION** – dehydration, salt depletion, dizziness, fever, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension and an elevated temperature.
- **HEAT STROKE** – Signs of heat exhaustion may still be present but has progressed to an altered mental status or seizure, rectal temp of  $>104^{\circ}$  F

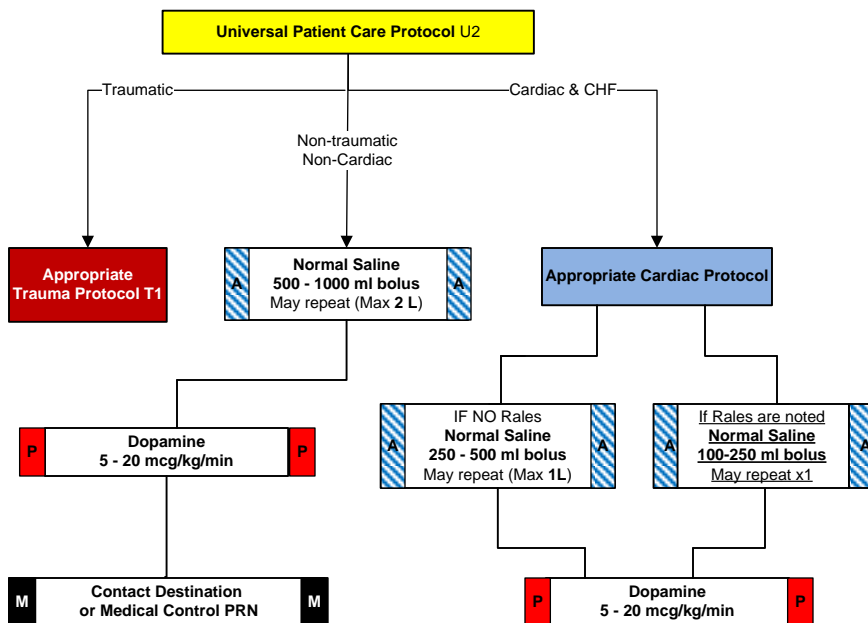
<b>History:</b> <ul style="list-style-type: none"> <li>Past medical history</li> <li>Medications</li> <li>Exposure to environment even in normal temperatures</li> <li>Exposure to extreme cold</li> <li>Extremes of age</li> <li>Drug use: Alcohol, barbiturates</li> <li>Infections/sepsis</li> <li>Length of exposure/wetness</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>Cold, clammy</li> <li>Shivering</li> <li>Mental status changes</li> <li>Extremity pain or sensory abnormality</li> <li>Bradycardia</li> <li>Hypotension or shock</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>Metabolic disorder</li> <li>Toxins</li> <li>Environmental exposure</li> <li>Shock</li> <li>Sepsis (elderly)</li> </ul>	<b>Frostbite stage 1:</b> numbness, white plaque with surrounding redness and edema, seizures, diabetes <b>Frostbite stage 2:</b> blisters surrounded by redness and edema <b>Frostbite stage 3:</b> Hemorrhagic blisters <b>Frostbite stage 4:</b> necrosis and tissue loss
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**Pearls:**

- Extremes of age are more susceptible (young & old)
- Transport immediately for re-warming. Notify receiving facility as early as possible.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature based on symptoms.
- Hypothermia may produce severe physiologic bradycardia. Do not treat unless profound hypotension unresponsive to fluids.
- Mild Hypothermia 34-36°C (93-96°F):** Lethargy, shivering, lack of coordination.
- Moderate Hypothermia 30-34°C (86-93°F):** confusion, shivering decreases, tachypnea with increasingly shallow resp, severe peripheral vasoconstriction, BP difficult to obtain, muscles starting to become rigid.
- At temps <30°C (86°F) ventricular fibrillation is a common cause of death. Handle gently to reduce this risk.**
- Severe Hypothermia <30°C (<86°F):** no shivering, pulse and slow respirations, dysrhythmias, asystole, loss of voluntary muscle control, hypotension, pupil dilation, unconscious.

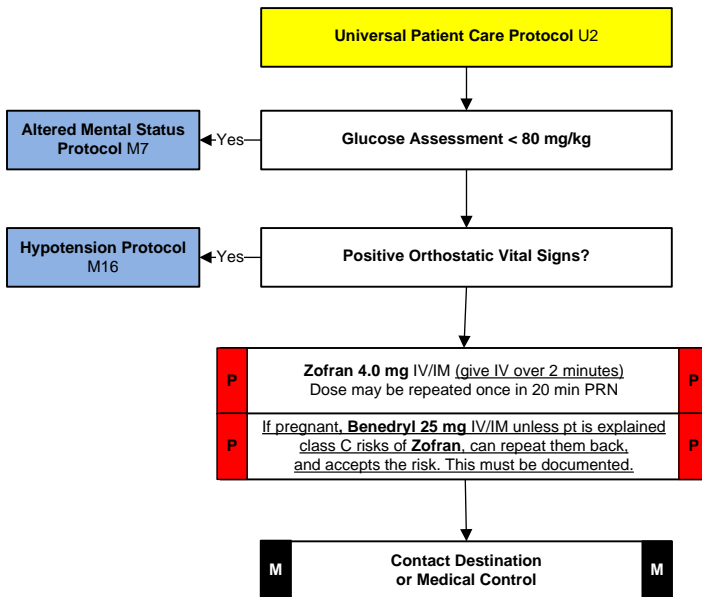
<b>History:</b> <ul style="list-style-type: none"> <li>Blood loss- vaginal or gastrointestinal bleeding, AAA, ectopic pregnancy</li> <li>Fluid Loss- vomiting, diarrhea, fever</li> <li>Infection</li> <li>Cardiac ischemia (MI, CHF)</li> <li>Medications</li> <li>Allergic Reaction</li> <li>Pregnancy</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>Restlessness, confusion</li> <li>Weakness, dizziness</li> <li>Weak, rapid pulse</li> <li>Pale, cool, clammy skin</li> <li>Delayed capillary refill</li> <li>Hypotension</li> <li>Coffee-ground emesis</li> <li>Tarry stools</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>Shock</li> <li>Hypovolemic</li> <li>Cardiogenic</li> <li>Septic</li> <li>Neurogenic</li> <li>Anaphylactic</li> <li>Ectopic pregnancy</li> <li>Dysrhythmias</li> <li>Pulmonary embolus</li> <li>Tension pneumothorax</li> </ul>
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### Pearls:

- Hypotension can be defined as a systolic blood pressure of (less than) < 90 mmHg.
- Consider all possible causes of shock and treat per appropriate protocol.
- Patients should always have adequate intravascular fluid load prior to the use of vasopressors .
- Place in supine position unless otherwise contraindicated.
- Positive orthostatic vital signs are an indicator of internal bleeding or fluid loss. Pulse and blood pressure taken when the patient is supine are compared with measurements when the patient rises to a sitting or standing position.
- Positive orthostatic signs: BP drops 10 mmHg or more, heart rate rises 20bpm or more, rapid change in skin color, dizziness, nausea, or disappearance of the radial pulse.
- In a patient with rales, if the first bolus was not effective, a second probably will not be either.

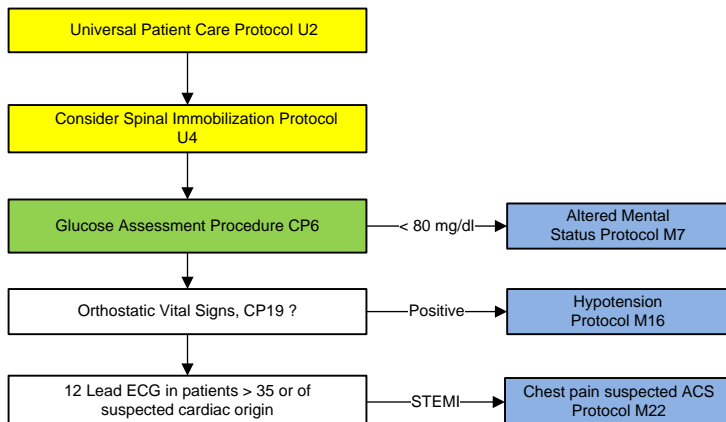
<p><b>History:</b>                  Age                  Time of last meal                  Last bowel movement / emesis                  Improvement or worsening with food or activity                  Duration of problem                  Other sick contacts                  Past Medical History                  Past Surgical History                  Medications                  Menstrual history / Pregnancy                  Travel history                  Bloody Emesis or diarrhea</p>	<p><b>Signs and Symptoms:</b>                  Fever                  Pain                  Rigidity                  Rebound                  Guarding                  Distension                  Constipation                  Diarrhea                  Anorexia                  Hematemesis</p>	<p><b>Differential:</b>                  CNS (Increased pressure, headache, stroke, CNS Lesions, trauma or hemorrhage, vestibular)                  AMI                  Drugs (NSAIDs, antibiotics, narcotics, chemotherapy)                  GI or Renal disorders                  Diabetic Ketoacidosis                  OB/GYN (Ovarian Cyst, pregnancy, PID)                  Infections (pneumonia, influenza)                  Electrolyte abnormalities                  Food or Toxin induced                  Medication or Substance abuse</p>
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**Pearls:**

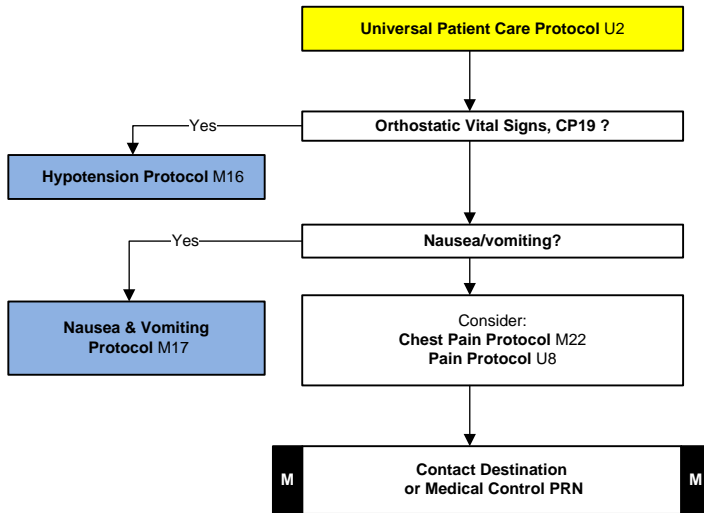
- Diabetic ketoacidosis may present as vomiting and/or abdominal pain.
- Positive orthostatic vital signs are an indicator of internal bleeding or fluid loss. Pulse and blood pressure taken when the patient is supine are compared with measurements when the patient rises to a sitting or standing position.
- Positive orthostatic signs: BP drops 10 mmHg or more, heart rate rises 20bpm or more, rapid change in skin color, dizziness, nausea, or disappearance of the radial pulse.

<p><b>History:</b></p> <ul style="list-style-type: none"> <li>• Presyncopal symptoms</li> <li>• Occult blood loss (GI, ectopic)</li> <li>• LMP, vaginal bleeding</li> <li>• Nausea, vomiting, diarrhea</li> <li>• Chest pain/palpitations</li> <li>• Shortness of breath</li> <li>• PMHx: Cardiac, CVA, Sz</li> <li>• New medications</li> </ul>	<p><b>Signs &amp; Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Loss of consciousness with recovery</li> <li>• Lightheadedness, dizziness</li> <li>• Palpitations, slow or rapid pulse</li> <li>• Pulse irregularity</li> <li>• Decreased blood pressure</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Vasovagal</li> <li>• Hypotension/Shock</li> <li>• Cardiac syncope</li> <li>• Incontinent of urine (Micturation) / Defecation syncope</li> <li>• Stroke</li> <li>• Hypoglycemia</li> <li>• Seizure</li> <li>• Toxicologic</li> <li>• Medication effect (hypotension)</li> </ul>
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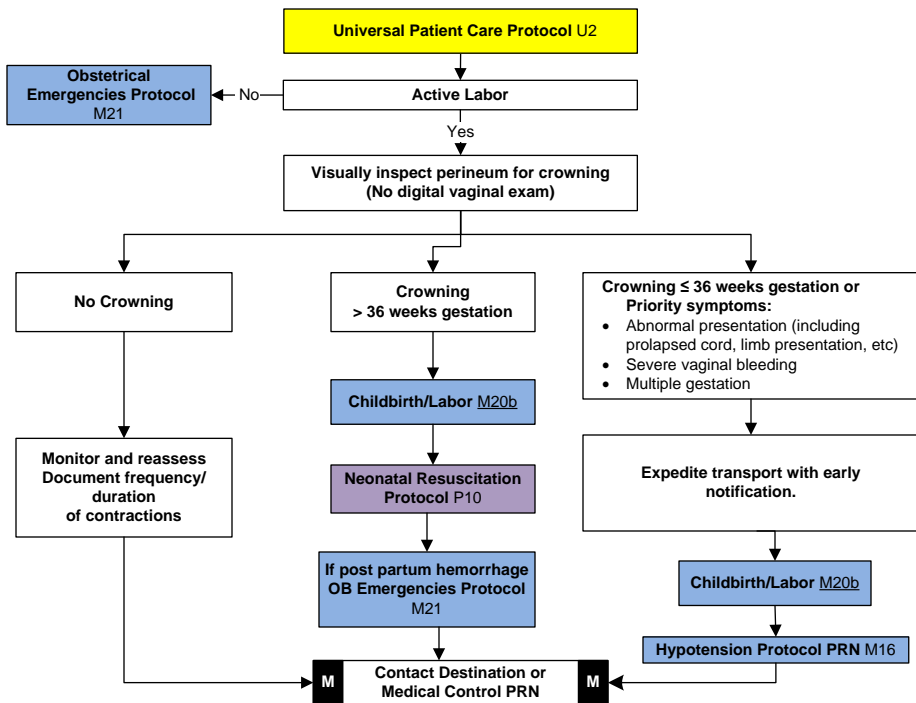
<p><b>Pearls:</b></p> <ul style="list-style-type: none"> <li>• Assess for signs and symptoms of trauma if associated or questionable fall with syncope.</li> <li>• Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.</li> <li>• More than 25% of geriatric syncope is cardiac dysrhythmia based.</li> </ul>
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<p><b>History:</b>                  Age                  Menstrual history (pregnancy)                  Past medical / surgical history                  Medications                  Onset                  Palliation / Provocation                  Severity (1-10)                  Quality (cramping, constant, sharp, dull...)                  Region / Radiation / Referred                  Time (duration / repetition)                  Fever                  Last meal eaten                  Last bowel movement / emesis</p>	<p><b>Signs &amp; Symptoms:</b>                  Pain (location / migration)                  Tenderness                  Nausea                  Vomiting                  Diarrhea                  Dysuria                  Constipation                  Vaginal bleeding / discharge                  Pregnancy</p>	<p><b>Differential:</b>                  Pneumonia or Pulmonary embolus                  Liver (hepatitis, CHF)                  Peptic ulcer disease / Gastritis                  Gallbladder                  Myocardial Infarction                  Pancreatitis                  Kidney Stone                  Abdominal aneurysm                  Appendicitis                  Bladder / Prostate disorder                  Pelvic (PID, Ectopic pregnancy, ovarian cyst)                  Mesenteric ischemia                  Diverticulitis                  Bowel obstruction                  Gastroenteritis (infectious)</p>
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<p><b>Pearls:</b></p> <ul style="list-style-type: none"> <li>Abdominal pain at or below the umbilicus in women of childbearing age should be treated as an ectopic pregnancy until proven otherwise</li> <li>The diagnosis of abdominal aneurysm should be considered with abdominal pain in patients over 50 Y/O.</li> <li>Orthostatics need not be assessed on obvious hypotensive patients.</li> <li>Women, elderly diabetic &amp; patients with complex medical conditions present differently with cardiac issues &amp; may have ABD pain above the umbilicus as presenting complaint. A 12-lead will help rule out cardiac related ABD pain.</li> </ul>
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<p><b>History</b>                  Last menstrual cycle and due date                  Time contractions started / how often                  Rupture of membranes                  Time / amount of any vaginal bleeding                  Sensation of fetal activity                  Past medical and delivery history                  Gravida/Para Status                  PMH/Medications/Allergies                  High Risk pregnancy (known)</p>	<p><b>Signs &amp; Symptoms</b>                  ABD pain                  Vaginal discharge or bleeding                  Crowning or perineal bulging                  Contraction intensity and duration                  Urge to push or have a bowel movement                  Meconium</p>	<p><b>Differential:</b>                  Abnormal presentation                  -- Buttock                  -- Foot                  -- Hand                  Prolapsed cord                  Placenta previa                  Abruptio placenta                  Premature labor</p>
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**Pearls:**

- Document all times (delivery, contraction frequency, and length). Record APGAR (A6) at 1 minute and 5 minutes after birth.
- If maternal seizures: refer to the Obstetrical Emergencies Protocol (M21). Eclampsia can occur up to 2 months post partum.
- After delivery, allowing child to nurse and massaging the uterus (lower abdomen) will promote uterine contraction and help to control postpartum bleeding.
- Post partum hemorrhage defined as blood loss > 500mL. The perineum should be checked for bleeding from vaginal tears. Bleeding should be controlled by direct pressure over the laceration.
- The most common cause of post partum hemorrhage is uterine atony due to prolonged labor, or multiple gestations.
- A fetus <20 weeks is considered non-viable. When in doubt, treat as viable.



## Normal Delivery

### Procedure:

- Delivery should be controlled so as to allow a slow, controlled delivery of the infant. This will prevent injury to the mother and infant.
- Consider additional resources as there will be two potential patients.
- Support the infant's head as it delivers.
- If the umbilical cord is around the neck, slip it over the head. If unable to free cord from the neck, double clamp the cord and cut between the clamps.
- Suction the airway with a bulb syringe.
- While continuing to support the head, gently lower the head to encourage delivery of the anterior shoulder.
- Once the anterior shoulder delivers gently lift the head and anterior shoulder to allow delivery of the posterior shoulder.
- Be prepared to support the infant while delivering the remainder of the body.
- Clamp the cord 6 inches and place second clamp 9 inches from the abdomen and cut the cord between the clamps.
- Record APGAR scores at 1 and 5 minutes.
- Follow the **Neonatal Resuscitation (P10)** for further treatment.
- The placenta will deliver spontaneously, usually within 5-25 minutes of the infant. Do not force the placenta to deliver or pull on the umbilical cord.
- Massage the uterus and/or initiate breast feeding (as infant and/or maternal condition allows) to stimulate uterine contractions, decrease bleeding and initiate delivery of the placenta. If the placenta delivers it should be retained for inspection. For post-partum hemorrhage refer to the OB Emergencies protocol.

## Abnormal Delivery

### Lib presentation

- Place mother in left lateral recumbent position, cover limb with towel; transport immediately. Do not attempt a pre-hospital delivery.

### Breech presentation

- Deliver body, supporting baby's weight.
- If head does not deliver after 3 minutes, make a "V" with gloved fingers and insert into vagina on both sides of the baby's nose.
- Push the wall of the vagina away from the baby's face, creating a air space for the baby.
- Transport immediately. Keep baby warm.

### Cord presentation

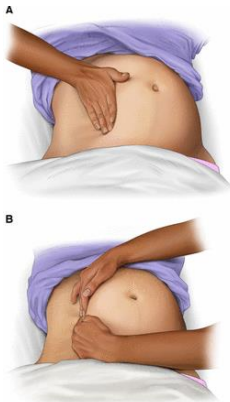
- Position mother on hands and knees, with hips elevated.
- Wrap cord and keep moist.
- With gloved hand, gently push the baby up the vagina several inches to release the pressure on the cord.
- Do not attempt to push the cord back. Discourage mother from pushing by asking her to "pant."
- Transport immediately.
- Obtain and document cord pulse.

### Cord wrapped around the neck

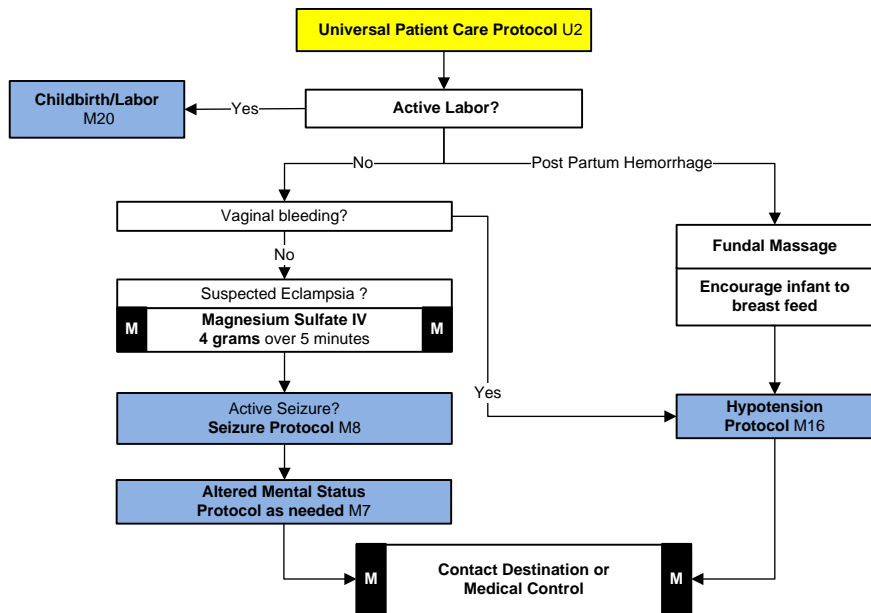
- Attempt to loosen enough to slide over the baby's head.
- If unsuccessful, or wrapped more than once, ask mother to stop pushing.
- Clamp cord in 2 places and cut (Never cut the cord without clamping first.)
- Baby should deliver.
- Apply second set of clamps once delivery is complete.

### Cardiac Arrest

- In the event of maternal arrest, if the fetus is >20 weeks (fetus at or above the umbilicus), manual left lateral uterine displacement effectively relieves aortic pressure. This may make chest compressions more effective. This can also be used for the critical hypotensive pregnant patient.
- Call for direction on delivering child via post mortem C-section if within 5 minutes of death.



<b>History:</b> <ul style="list-style-type: none"> <li>• Past medical history</li> <li>• Hypertension meds</li> <li>• Prenatal care</li> <li>• Prior pregnancies / births</li> <li>• Gravida / Para</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Vaginal bleeding</li> <li>• Abdominal pain</li> <li>• Seizures</li> <li>• Hypertension</li> <li>• Severe headache</li> <li>• Visual changes</li> <li>• Edema of hands and face</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Pre-eclampsia / Eclampsia</li> <li>• Placenta previa</li> <li>• Placenta abruptio</li> <li>• Spontaneous abortion</li> </ul>
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### Pearls:

- Eclamptic seizures may occur up to 2 months post partum. Always consider in pregnant/recently pregnant seizing patient.
- Severe headache, vision changes, edema, or RUQ pain may indicate preeclampsia.
- In the setting of pregnancy, hypertension is defined as a SBP >140 or a DBP > 90, or relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Magnesium may cause hypotension and decreased respiratory drive, monitor closely.
- Ask patient to quantify bleeding - number of pads used per hour.
- Post partum hemorrhage defined as blood loss > 500mL. 500mL blood loss is commonly seen in uncomplicated vaginal deliveries without signs or symptoms. The perineum should be checked for bleeding from vaginal tears which may be mistaken for uterine bleeding. Bleeding should be controlled by direct pressure over the laceration.
- The most common cause of post partum hemorrhage is uterine atony due to prolonged labor or multiple gestations
- If > 20 weeks, consider left lateral position.

<p><b>History</b></p> <ul style="list-style-type: none"> <li>Hypertension</li> <li>Hyperlipidemia</li> <li>Viagra, Levitra, or Cialis use</li> <li>Past medical history (MI, Angina, Diabetes, Post Menopausal)</li> <li>Family HX cardiovascular disease</li> <li>Recent physical exertion</li> <li>Smoker</li> <li>Stimulant use</li> <li><u>DNR status – relay to receiving facility as it is used to make treatment decisions regarding the cath lab.</u></li> </ul>	<p><b>Signs &amp; Symptoms</b></p> <ul style="list-style-type: none"> <li>CP (pain, pressure, aching, vice-like tightness)</li> <li>Nausea, vomiting, dizziness</li> <li>Shortness of breath</li> <li>Pale, diaphoresis</li> <li>Location (substernal, epigastric, arm, jaw, neck, shoulder)</li> <li>Radiation of pain</li> <li>Obesity</li> </ul>	<p><b>Differential</b></p> <ul style="list-style-type: none"> <li>Trauma vs. Medical</li> <li>Angina vs. Myocardial infarction</li> <li>Pericarditis</li> <li>Pulmonary embolism</li> <li>Asthma / COPD</li> <li>Pneumothorax</li> <li>Aortic dissection or aneurysm</li> <li>GI reflux or Hiatal hernia</li> <li>Esophageal spasm</li> <li>Chest wall injury or pain</li> <li>Plural pain</li> <li>Overdose (Cocaine)</li> </ul>
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**Patient may develop:**  
**Hypotension M16**  
**Dysrhythmia M24, 25, 26**  
**Nausea/Vomiting M17**

**Treat per appropriate protocol**

**Request a STEMI Alert, Transmit EKG, & start transport as early as possible to quickest PCI facility \***

If pt is unstable, meets diversion criteria\*\* or transport time will be >75 minutes, transport to quickest non-PCI facility

**NTG SL 0.4 mg q 3-5min**  
 if SBP  $\geq$  90, max of 3. Medics may continue until patient is pain free. Use caution in inferior MIs or if significant BP drop after 1<sup>st</sup> dose.

**Refer to Pain Protocol for Fentanyl dosing U8**

**Heparin 60 units/kg IV bolus.**  
 Max dose **4,000 units.**  
 If any bleeding concerns (listed in drug formulary) contact medical control prior to administration.

**Universal Patient Care Protocol U2**

**Aspirin 324 mg PO X1**

**Oxygen**  
 Titrate to SpO2  $>$ 92%

**Obtain 12 Lead ECG. Does the 12 lead say "MEETS ST ELEVATION MI CRITERIA"?**

Does medic interpretation show ST elevation  $\geq$  1mm in two contiguous leads?

**NTG SL 0.4 mg q 3-5min**  
 if SBP  $\geq$  90, max of 3. Medics may continue until patient is pain free.

**Refer to Pain Protocol U8**

**Contact Destination or Medical Control**

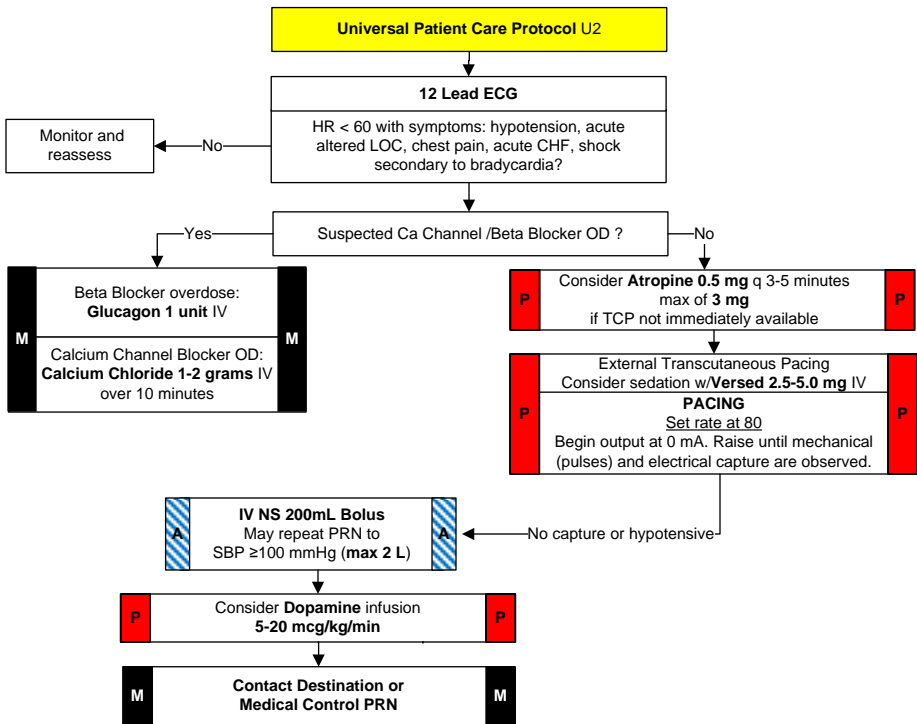
**Pearls:**

- Do not administer Nitroglycerin in any patient who has used Viagra (Sildenafil) or Levitra (Vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 48 hours due to potential severe hypotension.
- Contact receiving facility for ACS Consult if asymptomatic with EKG meeting STEMI criteria -or- symptomatic patient with LBBB of unknown age, sgarbossa criteria, De Winter's Twaves or ST depression in V1-V3 & unable to perform posterior EKG.
- If patient has ECG changes, or going directly to cardiac cath lab, establish a second IV ( $\geq$ 18) but do NOT delay transport
- Place fast patches on any patient that is or appears to be unstable. If possible run wires superiorly.
- Monitor for hypotension and respiratory depression after administration of **Nitroglycerin** and **Fentanyl**.
- Women, diabetics and geriatric patients often have atypical pain, or only generalized complaints such as weakness.
- Document STEMI in flow chart of ePCR.

\* Any STEMI Alert must be requested via the PCI (cath lab) hospital's process: Altru call (855) 425-8781, Sanford One Call (not ER) 701-234-5122, Essentia ER 701-364-8401. Transmitted 12-leads should have ambulance contact info on it & should be accompanied by a phone call as well.

\*\* **Diversion Criteria: possible need of head CT or neuro intervention/confusion, emergent intubation or immediate circulatory stabilization, chest trauma or MVC, DNR status, Left Bundle Branch Block**

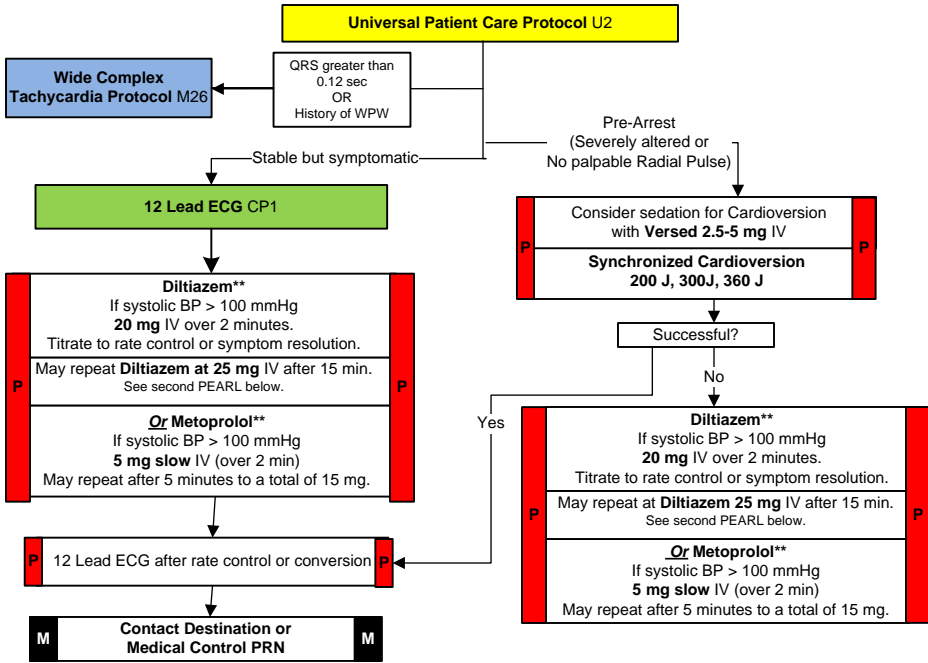
<p><b>History</b>                  Past Medical History                  Medications</p> <ul style="list-style-type: none"> <li>• Beta Blockers</li> <li>• Calcium Channel Blockers</li> <li>• Digoxin</li> <li>• Cholinergics</li> <li>• Clonidine</li> </ul> <p>Pacemaker                  Events Leading to Current Status</p>	<p><b>Signs &amp; Symptoms</b>                  HR &lt;60/min with:</p> <ul style="list-style-type: none"> <li>• Hypotension,</li> <li>• Acute altered LOC,</li> <li>• Chest pain,</li> <li>• CHF,</li> <li>• Seizure,</li> <li>• Syncope or shock</li> </ul>	<p><b>Differential</b>                  Acute MI                  Hypoxia                  Pacemaker Failure                  Hypothermia                  Sinus Bradycardia                  Electrolyte Abnormality (K+)                  CVA, increased ICP, Head Injury                  Spinal Cord Lesion                  Sick Sinus Syndrome                  AV Blocks                  OD</p>
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**Pearls:**

- Treatment of bradycardia is based on the presence of symptoms. If asymptomatic, monitor only.
- Consider treatable causes for bradycardia (Beta blocker OD, Calcium channel blocker OD, etc.) - treat appropriately
- If wide complex bradycardia consider hyperkalemia.
- Hypothermia may produce severe physiologic bradycardia. Do not treat unless profound hypotension unresponsive to fluids.

<p><b>History:</b>                  Medications (Aminophylline, Diet pills, Thyroid supplements, Digoxin, decongestants)                  Diet (caffeine, chocolate)                  Drugs (nicotine, cocaine)                  Past medical history                  History of palpitations / heart racing</p>	<p><b>Signs and Symptoms:</b>                  HR &gt; 150/Min                  QRS less than 0.12 sec                  QRS greater than 0.12 sec or history of WPW go to V-Tach with pulse Protocol                  Dizziness, CP, SOB                  Syncope / near syncope</p>	<p><b>Differential:</b>                  Heart disease (WPW, Valvular)                  Sick sinus syndrome                  Myocardial infarction                  Electrolyte imbalance                  Exertion, Pain, Emotional stress                  Fever                  Hypoxia                  Hypovolemia or Anemia                  Drug effect / Overdose (see Hx)                  Hyperthyroidism                  Pulmonary embolus</p>
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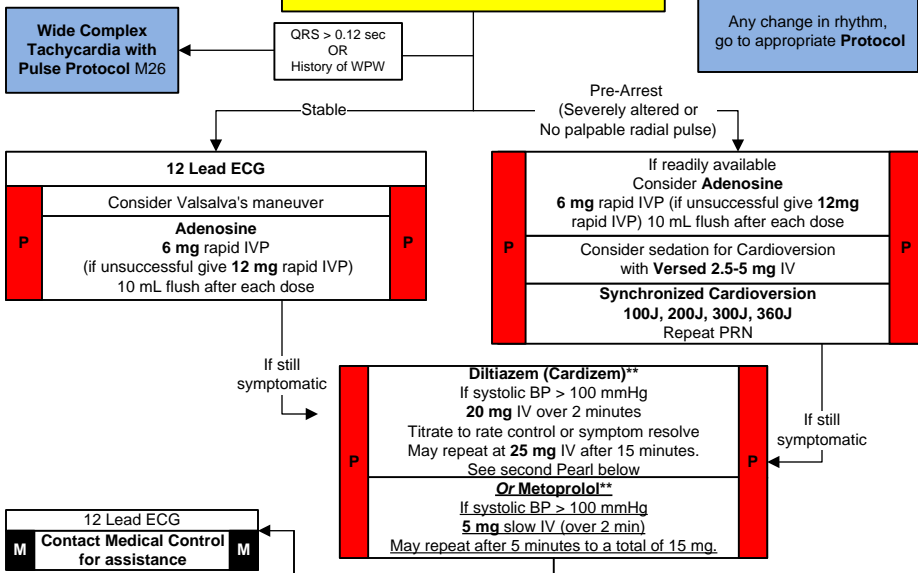


**Pearls:**

- If patient has history of or 12 Lead ECG reveals Wolfe Parkinson White (WPW), do not use Diltiazem and contact medical control before using metoprolol.
  - If BP is lower than or near 100 systolic, start with ½ dose of Diltiazem or administer even slower. If patient weight is <50 kg or appears frail, give 0.25 mg/kg (repeat dose is 0.35 mg/kg) instead of standard dose.
  - Adenosine may not be effective in identifiable atrial flutter/fibrillation, but is not harmful.
  - Monitor for hypotension after administration of Diltiazem or metoprolol.
  - Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
  - Continuous SpO2 is required for all Atrial Fibrillation Patients.
  - Rapid ventricular response is defined as rate > 100 however rate related signs and symptoms are uncommon with HR ≤ 150/min in patients with healthy heart. If patients are symptomatic at lower rates, consider & treat possible underlying causes such as fluid loss, dehydration, anxiety, hypoxia, etc prior to rate control.
- \*\* Diltiazem and Metoprolol should never be given together unless by medical direction. Use one or the other.

<b>History:</b> Medications (Aminophylline, diet pills, Thyroid supplements, decongestants, Digoxin) Diet (caffeine, chocolate) Drugs (nicotine, cocaine, methamphetamines) Past medical history History of palpitations / heart racing Syncope / near syncope	<b>Signs and Symptoms:</b> HR greater than 150/Min <b>QRS less than 0.12 Sec (QRS greater than 0.12 sec go to V-Tach Protocol)</b> <b>If history of WPW, go to V-Tach Protocol</b> Dizziness, CP, SOB Potential presenting rhythm Sinus tachycardia Atrial fibrillation / flutter Multifocal atrial tachycardia	<b>Differential:</b> Heart disease (WPW, Valvular) Sick sinus syndrome Myocardial infarction Electrolyte imbalance Exertion, Pain, Emotional stress Fever Hypoxia Hypovolemia or Anemia Drug effect / Overdose (see Hx) Hyperthyroidism Pulmonary embolus
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## Universal Patient Care Protocol U2

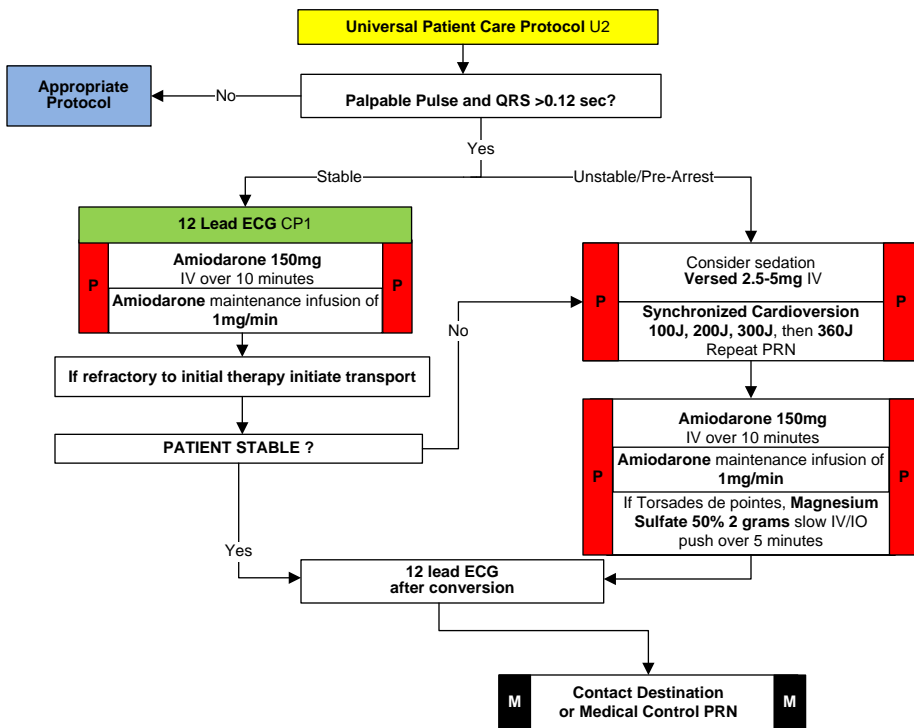


## Pearls:

- If patient has history of or 12 Lead ECG reveals Wolfe Parkinson White (WPW), do not use Diltiazem and contact medical control before using metoprolol.
- If BP is lower than or near 100 systolic, start with ¼ dose of Diltiazem or administer even slower. If patient weight is <50 kg or appears frail, give 0.25 mg/kg (repeat dose is 0.35 mg/kg) instead of standard dose.
- If patient requires multiple conversion attempts without resolution consider alternative cause of dysrhythmia.
- Adenosine may not be effective in identifiable atrial flutter/fibrillation, but is not harmful.
- Monitor for respiratory depression and hypotension associated with Versed.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Continuous SpO<sub>2</sub> is required for all SVT Patients.
- Serious S/S are uncommon with HR < 150. Patients with impaired cardiac function may become symptomatic at lower HR.
- If patients are symptomatic at lower rates, consider sinus tachycardia & treat possible underlying causes such as fluid loss, dehydration, anxiety, hypoxia, etc prior to rate control.

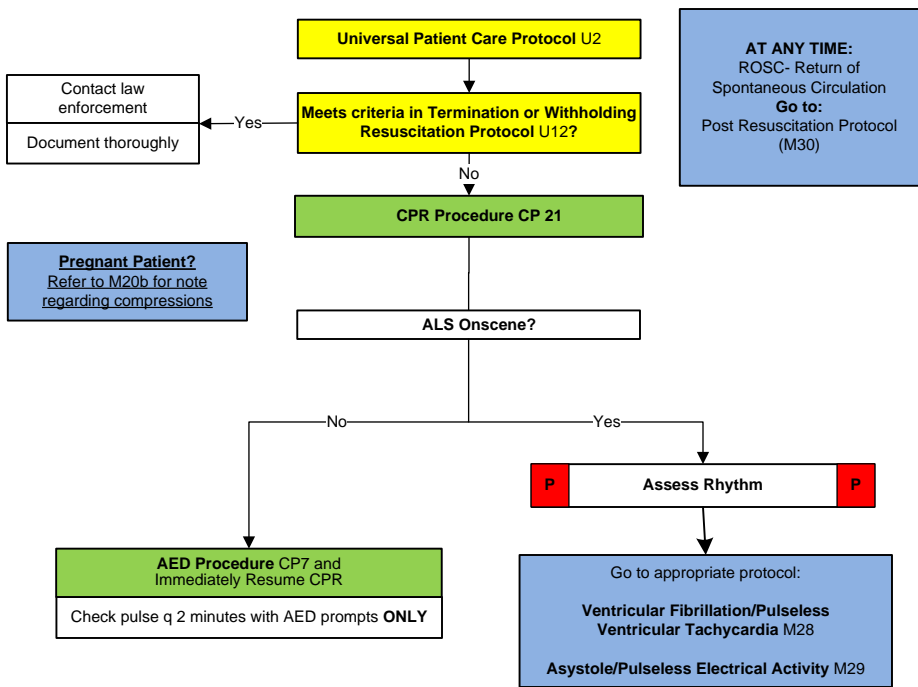
\*\* Diltiazem and Metoprolol should never be given together unless by medical direction. Use one or the other.

<p><b>History:</b>                  Past medical history / medications, diet, drugs                  Syncope / Near syncope                  Palpitations                  Pacemaker                  Allergies: Lidocaine / Novocaine</p>	<p><b>Signs and Symptoms:</b>                  Ventricular Tachycardia on ECG (Runs or Sustained)                  Conscious, rapid pulse                  Chest Pain, Shortness of Breath                  Dizziness                  Rate usually 150-180 bpm for sustained V-Tach                  QRS &gt; 0.12 sec</p>	<p><b>Differential:</b>                  Artifact / Device Failure                  Cardiac                  Endocrine/Electrolyte                  Drugs/Toxic exposure                  Pulmonary disease</p>
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- Pearls:**
- For witnessed / monitored ventricular tachycardia, try having patient cough or use vagal maneuvers
  - If hyperkalemia consider **Calcium Chloride 1-2 g** over 10 min or tricyclic OD consider **Sodium Bicarbonate 1.0 mEq/kg** early in intervention. **Both require medical control orders.**
  - May consider giving half the dose of **Amiodarone** maintenance infusion (**0.5mg/min**) if patient is hypotensive.

<b>History:</b> <ul style="list-style-type: none"> <li>• Events leading to arrest</li> <li>• Estimated downtime</li> <li>• Past medical history</li> <li>• Medications</li> <li>• Existence of terminal illness</li> <li>• Signs of lividity or rigor</li> <li>• DNR</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Unresponsive</li> <li>• Pupils: dilated, sluggish, non-reactive</li> <li>• Apneic or abnormal breathing (gasps)</li> <li>• Pulseless</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Medical vs. Trauma</li> <li>• VF vs Pulseless VT</li> <li>• Asystole</li> <li>• PEA</li> </ul>
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<b>Pearls:</b> <ul style="list-style-type: none"> <li>• Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.</li> <li>• Reassess airway frequently and after every patient move.</li> <li>• Immediate and adequate compressions with timely defibrillation are the keys to success. Rotate compressors every 2 minutes to prevent fatigue. Compress chest at least 2 inches and allow complete recoil.</li> <li>• Minimize interruptions in chest compressions. Do not interrupt compressions for airway placement or med administration.</li> <li>• If trauma is suspected, use Spinal Precautions Protocol U4.</li> <li>• If scene or pt condition suggests hypothermic arrest go to cold emergencies protocol. Hypothermic patients may appear dead. Time spent assessing respiratory effort, pulse and viability is valuable.</li> <li>• The AHA separates adult and pediatric guidelines by signs of secondary sex characteristics or the onset of puberty.</li> <li>• When an AED is used, it should be downloaded into ePCR and a report printed for the physicians.</li> <li>• <u>Witnessed arrests should be transported early for possible reperfusion or other definitive therapy.</u></li> </ul>
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# Ventricular Fibrillation & Pulseless Ventricular Tachycardia

M-28

<b>History:</b> <ul style="list-style-type: none"> <li>• Estimated Down Time</li> <li>• Past Medical History</li> <li>• Medications</li> <li>• Events leading to arrest</li> <li>• Renal Failure / Dialysis</li> <li>• DNR</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Unresponsive, Apneic, Pulseless</li> <li>• Ventricular fibrillation or ventricular tachycardia on ECG</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Asystole</li> <li>• Artifact / Device Failure</li> <li>• Cardiac</li> <li>• Endocrine / Medicine</li> <li>• Drugs</li> <li>• Pulmonary</li> </ul>
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**Cardiac Arrest Protocol M27**

**Defibrillation Procedure CP7 q 2 minutes:**  
 AED or 200,300,360J manual device.  
 Immediately Resume CPR  
 Check rhythm and pulse q 2 minutes ONLY

**Epinephrine 1:10,000 1mg IV**  
 Repeat q 3-5 minutes

**Amiodarone 300mg IV push**  
 Repeat in 3-5 min at **150 mg IV push x 1**

**Polymorphic VT (Torsades) may benefit from Magnesium Sulfate 2 grams slow IV push**

**ROSC?**

No

**Refer to Termination or Withholding Resuscitation Protocol. U12**

**Change in rhythm at any time:**  
 Go to appropriate protocol

**Look for treatable causes:**

**Hypoxia**

**Hypothermia**  
 Go to cold emergencies protocol M15

**Hypovolemia**  
 NS 1L bolus IV/IO

**Hypoglycemia M7**  
 D10 100mL IV/IO

**Tension Pneumothorax**  
 Pleural Decompression CP5

**Contact Medical Control prior to the following treatments:**

**Acidosis**  
 Sodium Bicarbonate 50-100 mEq IV/IO

**Hyperkalemia**  
 Calcium chloride 1-2 gm IV/IO  
 Sodium Bicarbonate 50-100 mEq IV/IO

**OD Calcium channel/Beta blocker**  
 Calcium chloride 1-2 gm IV/IO  
 Glucagon 1 unit IV/IO

**AT ANY TIME:**  
 Return of Spontaneous Circulation go to Post Resuscitation Protocol M30

**Pearls:**

- Reassess and document ETT/King Airway placement after every move and at transfer of patient care.
- Assess and treat for reversible causes.
- Continuous ETCO<sub>2</sub> monitoring should be initiated as soon as practical.
- Priorities: uninterrupted compressions, defibrillation, then IV/IO and airway control.
- Effective CPR and prompt defibrillation are the keys to successful resuscitation.
- Patients in persistent or refractory VF/VT should be transported for further evaluation of treatment possibilities.

**History:**

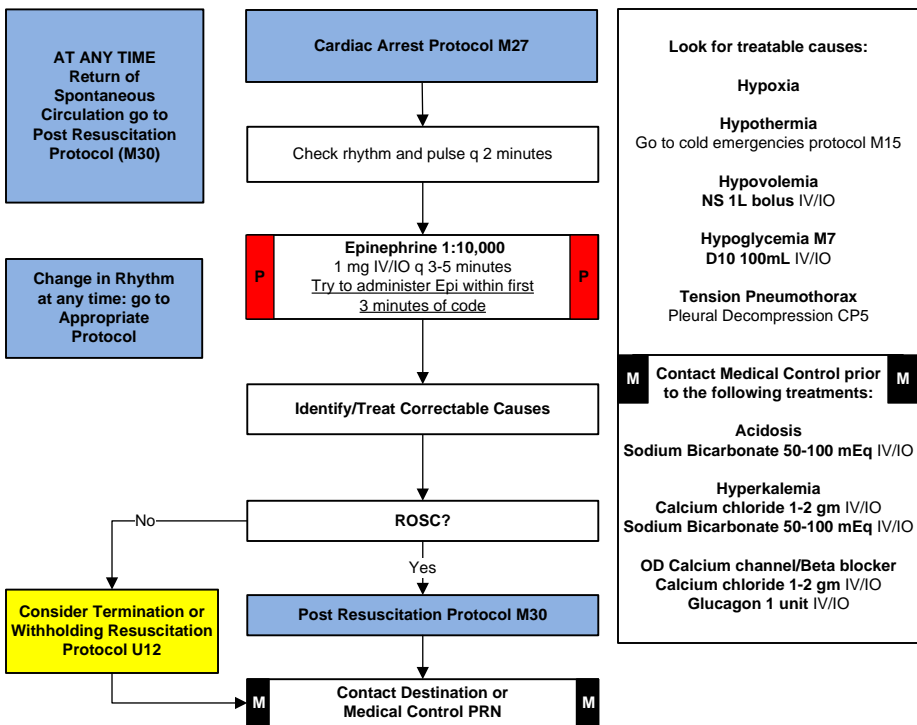
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
- DNR

**Signs and Symptoms:**

- Pulseless
- Apneic or abnormal breathing (gasp)
- No electrical activity on ECG
- No auscultated heart tones

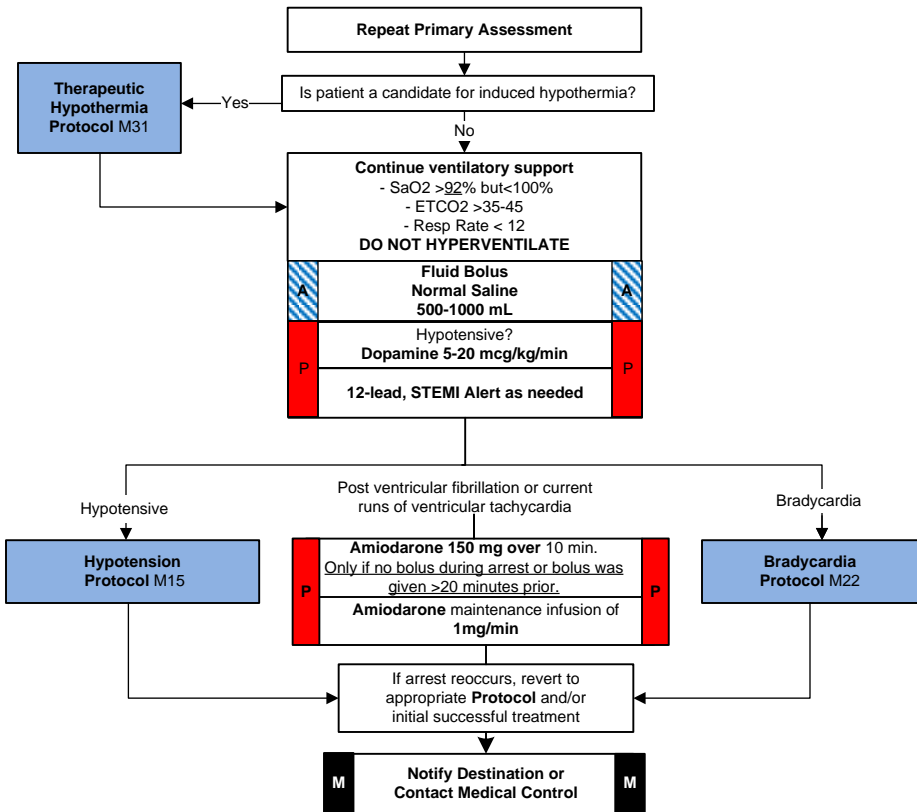
**Differential:**

- Medical or Trauma
- Hypoxia
- Potassium (hyper/hypo)
- Drug overdose
- Acidosis
- Hypothermia
- Device (machine error)
- Obvious Death

**Pearls:**

- Always confirm asystole in more than one lead
- Pay special attention to pts with either a narrow complex rhythm or rising EtCO<sub>2</sub> as there may be a correctable cause.
- Prior to requesting orders to stop resuscitation the following should be completed and discussed w/medical control:
  - Assess pulse and rhythm for 10 sec.
  - Confirm rhythm by printing 10 sec of strip.
  - Review correctable causes
  - Listen for heart tones
  - Review EtCO<sub>2</sub> (values >10 may be resuscitable)
  - Utilize crew resource management for further ideas

<b>History</b> <ul style="list-style-type: none"> <li>Respiratory Arrest</li> <li>Cardiac Arrest</li> </ul>	<b>Signs &amp; Symptoms</b> <ul style="list-style-type: none"> <li>Return of pulse</li> </ul>	<b>Differential</b> <ul style="list-style-type: none"> <li>Continue to address specific differentials associated with original dysrhythmia</li> </ul>
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**Pearls:**

Hyperventilation is a significant cause of hypotension and cardiac arrest in the post resuscitation phase. It must be avoided at all cost.

Most patients immediately post resuscitation will require ventilatory assistance. Oxygen should be titrated to SaO<sub>2</sub> of >92%. The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post resuscitation management can best be planned in consultation with medical control.

Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.

Significant ectopy is defined as a dysrhythmia that meets treatment criteria as part of another protocol (i.e. V-Tach)

May consider giving half the dose of **Amiodarone** maintenance infusion (**0.5mg/min**) if pt is hypotensive.

<b>History:</b> <ul style="list-style-type: none"> <li>• Non-Traumatic Cardiac Arrest</li> <li>• Witnessed Cardiac Arrest</li> <li>• CPR w/1 15 minutes of arrest</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Return of spontaneous circulation</li> <li>• No purposeful movement</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Continue to address specific differentials associated with original dysrhythmia</li> </ul>
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Return Of Spontaneous Circulation (ROSC)

Criteria for Therapeutic Hypothermia?  
(see pearls below)

**AT ANY TIME**  
Loss of Spontaneous Circulation:  
Discontinue cooling and go to appropriate protocol

Post Resuscitation Protocol M30

Unsuccessful

Airway Protocol U3

Advanced Airway Placed and ETCO<sub>2</sub> reading > 35-45 mmHg

Successful

Goal is a temp between 32-36° C  
(89.6-96.8° F).

If Pt temp drops below 32°C remove ice packs and discontinue cold fluid. Allow pt to rewarm to 32°C

Expose patient  
Apply Ice Packs to Axilla, Neck & Groin

A	Place Temp Probe <b>CP27</b> Place thermometer rectally if no probe	A
P	Perform 12 Lead ECG Activate STEMI Alert PRN	P
P	<b>Maintain Sedation:</b> Watch for signs of discomfort (tachycardia, tearing) throughout pt care <b>Refer to protocol U3 for dosing</b>	P
P	<b>Cold Saline Bolus 500 ml over 15 min.</b> <u>May repeat once.</u>	P

M

Contact Destination EARLY or to consider pediatric patients

M

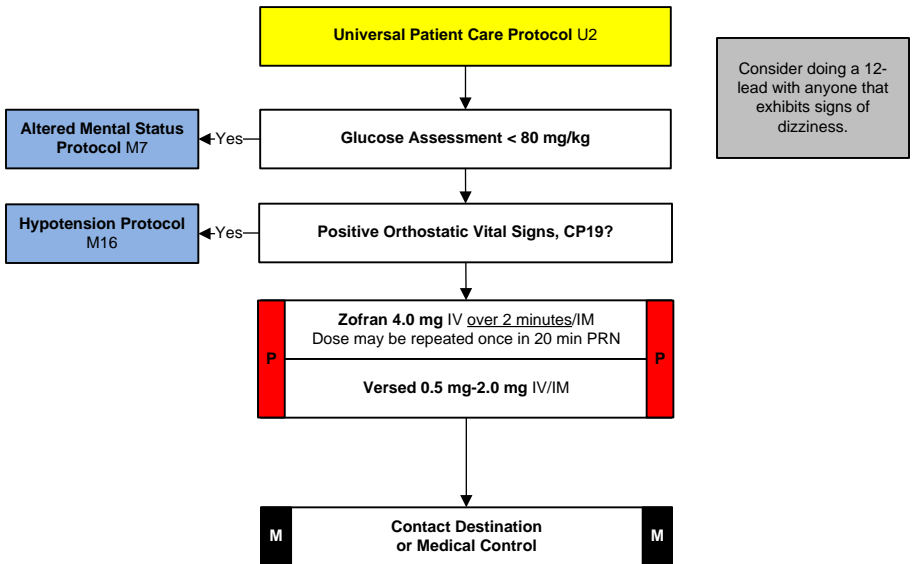
**Pearls:**

**Inclusion criteria for therapeutic hypothermia:**

- Witnessed cardiac arrest with ROSC within 60 min.
- CPR was initiated within 15 min of arrest.
- Patient remains unresponsive with no purposeful movement. (cough or gag reflex is permissible)
- Blood pressure maintained ≥ 90 mmHg systolic either spontaneously or with fluid and pressors.
- Airway must be secured with either ETT or King LTS-D
- No terminal illness
- No active bleeding
- No suspected traumatic arrest or recent major head trauma.

Consider sedation dosing at the higher limits to adequately prevent shivering.

<p><b>History:</b></p> <ul style="list-style-type: none"> <li>• Age</li> <li>• Time of last meal</li> <li>• Last bowel movement / emesis</li> <li>• Improvement or worsening with food or activity</li> <li>• Duration of problem</li> <li>• Other sick contacts</li> <li>• Past Medical History</li> <li>• Past Surgical History</li> <li>• Medications</li> <li>• Menstrual history / Pregnancy</li> <li>• Travel history</li> <li>• Bloody Emesis or diarrhea</li> </ul>	<p><b>Signs and Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Lightheaded</li> <li>• Syncope or near syncope</li> <li>• Orthostatic Hypotension</li> <li>• Nausea/Vomiting</li> <li>• Fatigue</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• CNS (Increased pressure, headache, stroke, CNS Lesions, trauma or hemorrhage)</li> <li>• AMI</li> <li>• Drugs (NSAIDs, antibiotics, narcotics, chemotherapy.)</li> <li>• GI or Renal disorders</li> <li>• Diabetic Ketoacidosis</li> <li>• OB/GYN (Ovarian Cyst, pregnancy, PID)</li> <li>• Infections (pneumonia, influenza)</li> <li>• Electrolyte abnormalities</li> <li>• Food or Toxin induced</li> <li>• Medication or Substance abuse</li> </ul>
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<p><b>Pearls:</b></p> <ul style="list-style-type: none"> <li>• Diabetic ketoacidosis may present as vomiting and/or abdominal pain.</li> </ul>
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# Pediatric Protocols

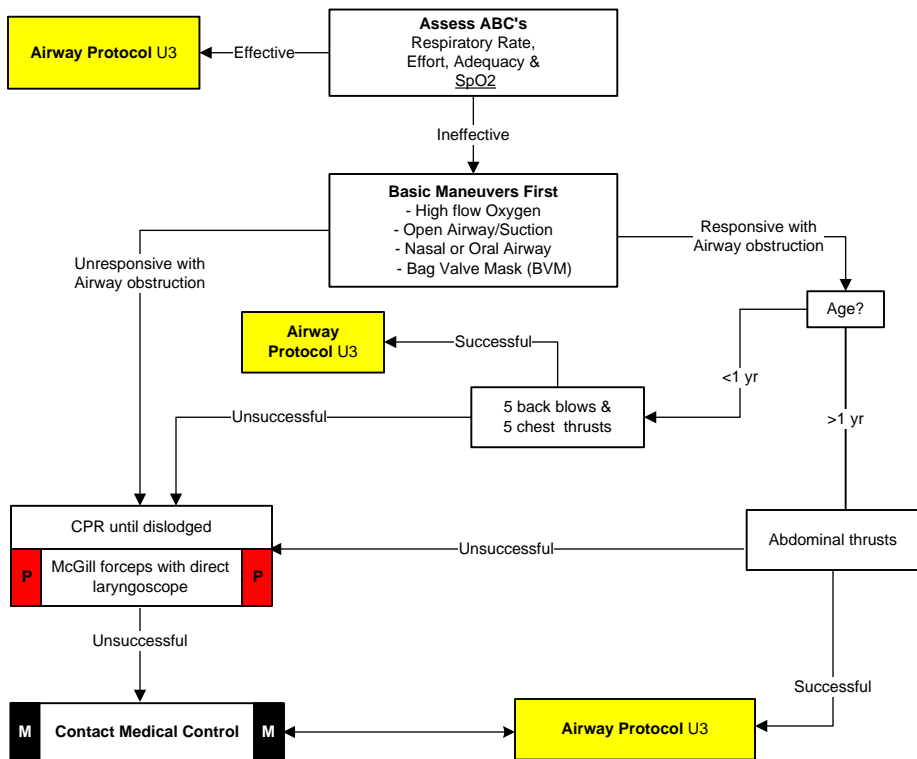
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For purposes of these protocols, pediatric patients are defined as less than 37kg (approx 80lbs).

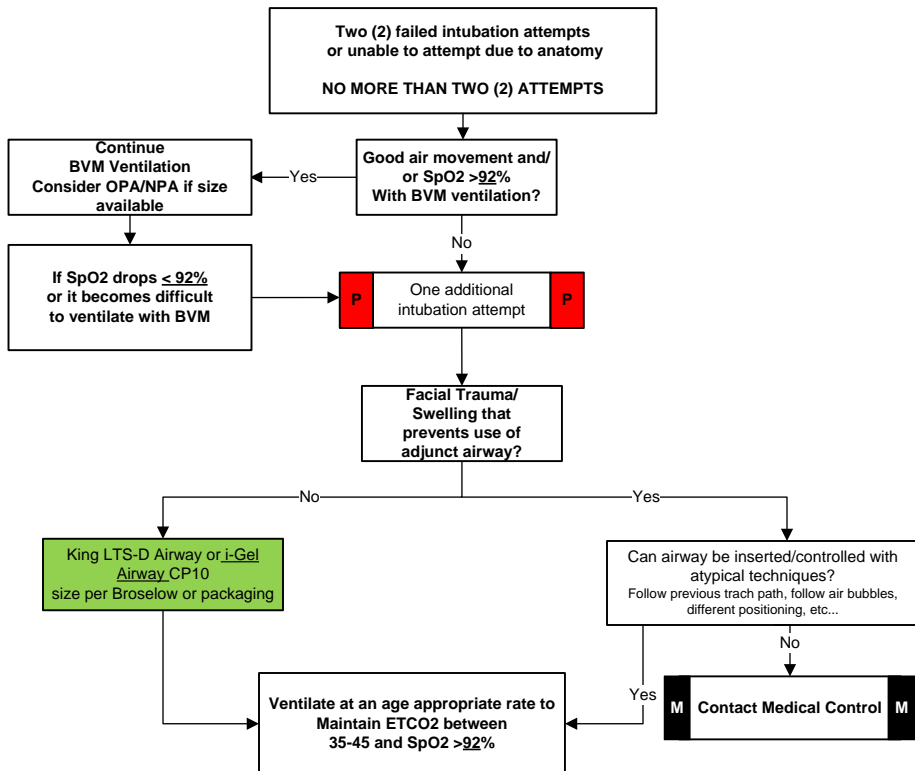
If a specific pediatric protocol is unavailable, refer to the adult protocol and contact medical control as needed to adjust treatments.





### Pearls:

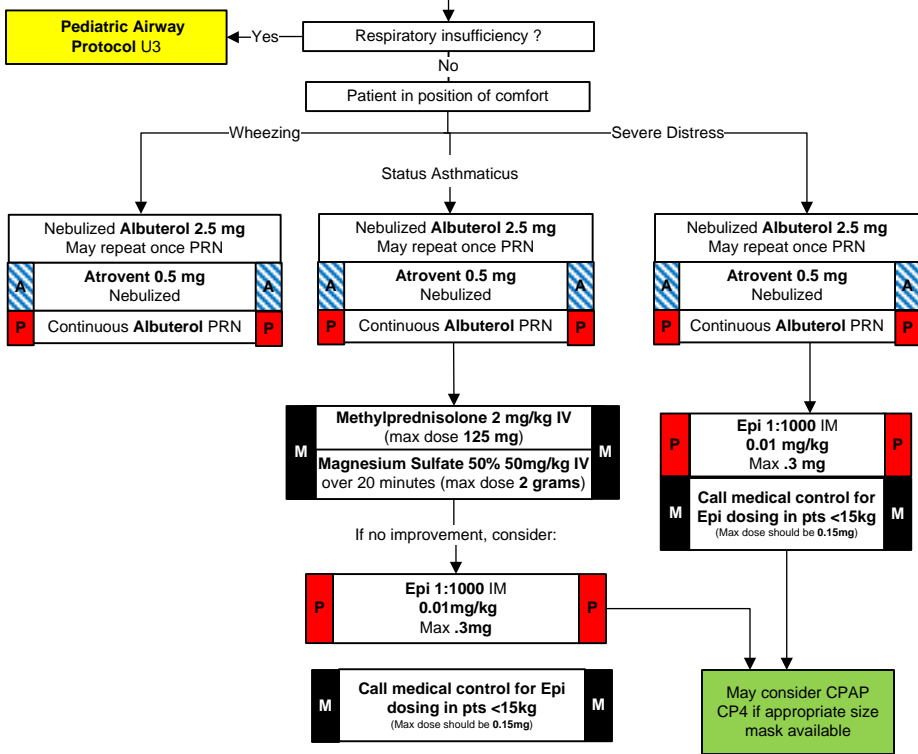
- This protocol is only for use in patients  $\leq 37$  Kg or patients acceptable for the Broselow-Luten Tape.
- Suction applied for  $> 10$  seconds may cause hypoxia and dysrhythmias.
- Be prepared for vomit following removal of obstruction.
- Do not intervene in patients with a partial airway obstruction with good air exchange.

**Pearls:**

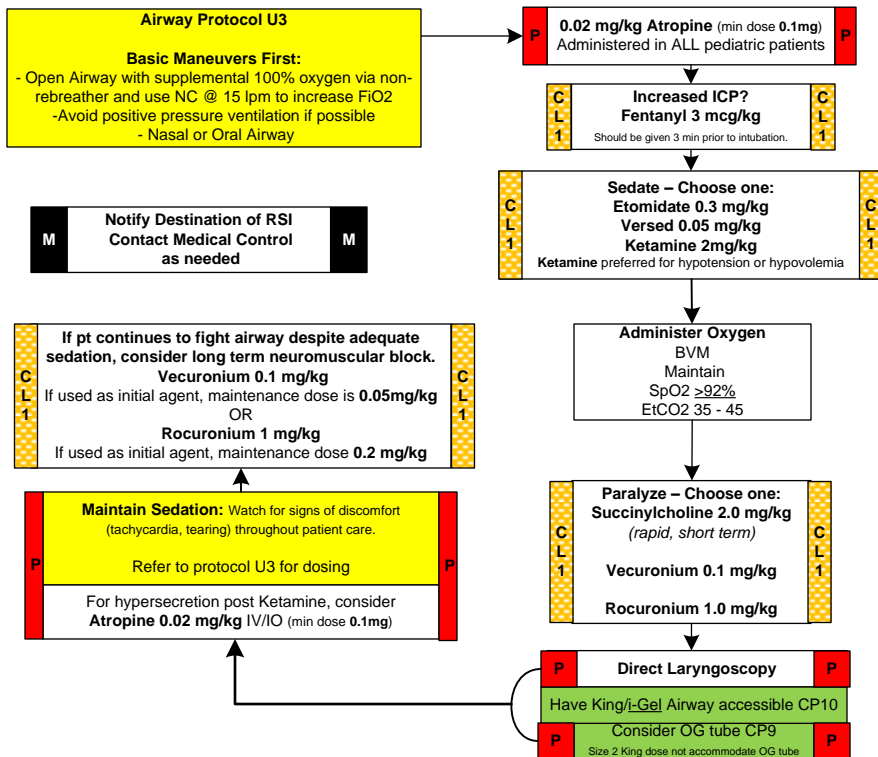
- This protocol is only for use in the patients with an weight of <37 kg or patient fits the Broselow-Luten Tape.
- The majority of pediatric airways are managed with basic interventions. Use only the interventions needed to deliver adequate oxygenation and ventilation.
- Capnography (EtCO<sub>2</sub>) is mandatory with all Advanced airways. Document Results.
- If an airway is being maintained by BVM with SpO<sub>2</sub> >92%, it is acceptable to maintain basic airway measures instead of using an ET.
- A secure airway is when the patient has appropriate oxygenation and ventilation.
- An advanced procedure form is required on all patients where an ETT or King/i-Gel Airway is used.
- Maintain C-Spine in those patients with suspected spinal injury.
- Consider c-collar with ETT tube for stabilization.
- BURP method and a two handed intubation technique should be used to assist with difficult intubations.
- If first ET attempt is unsuccessful consider:
  - Different laryngoscope blade
  - Different ETT size
  - Change Cricoid Pressure
  - Patient/Provider Position
- Continuous pulse oximetry should be used and documented.
- Notify Medical Control ASAP regarding patient's difficult or failed intubation.

<p><b>History:</b>                  Time of onset                  Foreign Body Airway Obstruction                  Fever or infection                  Sick contacts                  Asthma                  Treatment (oxygen, nebulizer)                  Medications steroids, inhalers                  Toxic exposure                  Trauma</p>	<p><b>Signs &amp; Symptoms:</b>                  Shortness of breath                  Pursed lip breathing                  Decreased ability to speak                  Increased respiratory rate and effort                  Wheezing, rhonchi, rales, stridor                  Use of accessory muscles                  Fever, cough                  Tachycardia                  Anxious appearance</p>	<p><b>Differential:</b>                  Asthma                  Aspiration                  Foreign body                  Pneumonia                  Croup/Epiglottitis                  Congenital heart disease                  Medication or Toxin                  Trauma</p>
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**Universal Patient Care Protocol U2**



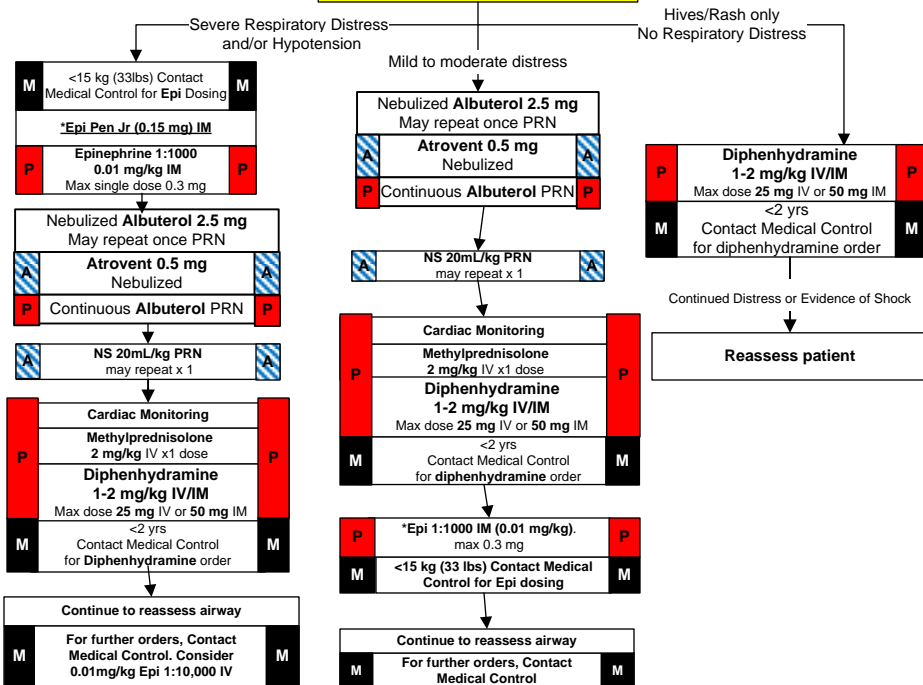
**Pearls:**  
 A quiet chest is indicative of severe bronchospasm.  
 Patient respiratory status must be reassessed after each **2.5 mg Albuterol** to determine need for additional dosing.  
 SpO2 must be monitored continuously if initial saturation is  $\leq 92\%$ , or there is a decline in patient's status.

**Pearls:**

- **RSI approved Paramedics ONLY**
- **Use reference card provided in RSI tray.**
- A sedative **must** be given prior to a paralytic medication. (Because of Vecuronium vs. Etomidate onset times, Vecuronium may be given 1-2 min prior to Etomidate to achieve the appropriate sedation for patient.)
- Succinylcholine is a short acting paralytic. Do not use in crush injuries or burns >72 hours old, history of malignant hyperthermia, hyperkalemia, ALS, neuromuscular disease, myasthenia gravis.
- Succinylcholine can not be used more than once. Administering a second dose may cause reflex bradycardia.
- Capnography (EtCO2) is mandatory with all methods of intubation. Document results.
- If an effective airway is being maintained by BVM with continuous SpO2 values of > 92, it is acceptable to continue with basic airway measures instead of Intubation.
- For the purposes of this protocol a secure airway is when the patient is receiving appropriate oxygenation and ventilation.
- An Intubation attempt is defined as passing the endotracheal tube past the teeth.
- Ventilatory rate should be age appropriate to maintain a EtCO2 between 35 and 45. Avoid hyperventilation.
- Maintain C-spine immobilization for patients with suspected spinal injury.
- BURP maneuver and a two handed intubation technique should be used to assist with difficult intubations. (CP11)
- Complete Advanced Procedure Form with physician signature.
- Second dosage of **Vecuronium** or **Rocuronium** isn't usually needed for 45 minutes.

<p><b>History</b></p> <p>Medication history Onset and location Past medical history Past history of reactions New clothing, soap, detergent Medication allergy / exposure Food allergy / exposure Insect sting or bite</p>	<p><b>Signs &amp; Symptoms</b></p> <p>Edema / Voice Changes Itching or hives Coughing / wheezing or respiratory distress Chest or throat constriction Difficulty swallowing Hypotension or shock</p>	<p><b>Differential</b></p> <p>Urticaria (rash only) Anaphylaxis (systemic effect) Shock (vascular effect) Angioedema (drug induced) Aspiration / Airway obstruction Vasovagal event CHF Asthma or COPD</p>
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## Universal Patient Care Protocol U2



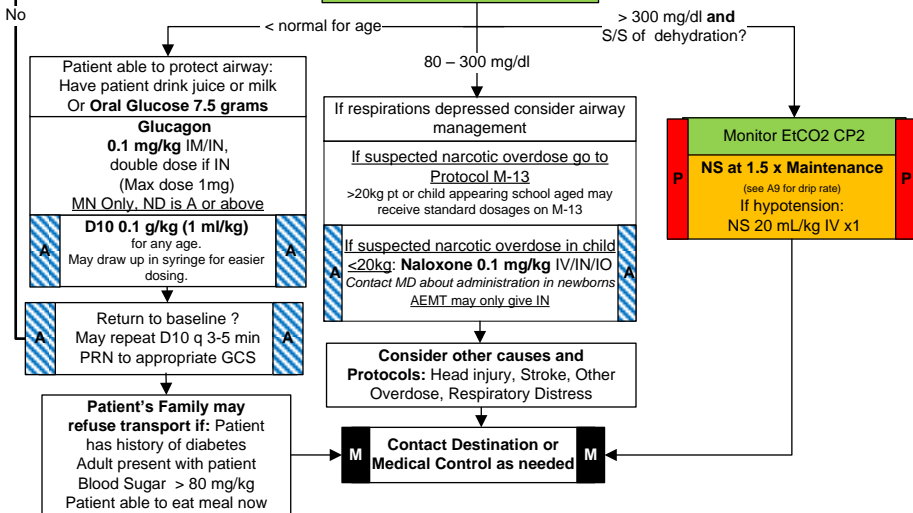
**Pearls:**

These patients should receive continuous cardiac monitoring.  
Any patient with respiratory symptoms or extensive skin reaction should receive IV or IM **Diphenhydramine**, Do not administer **Diphenhydramine** to a child <2 y/o without a physicians order.  
Call for administration of **Epinephrine 1:1000** in patients < 15 kg. Standard dosing is **0.01mg/kg**. Single max dose **0.15mg**. The shorter the onset from exposure to symptoms the more severe the reaction.  
Fluids and Medication titrated to maintain a SBP >70 + (age in years x 2) mmHg  
Cold pack to bite or sting site.  
Severe reactions are considered reactions with hypotension, impending respiratory or cardiac arrest.  
Consider **Albuterol** nebulizer for shortness of breath even without wheezing.

<b>History:</b> <ul style="list-style-type: none"> <li>Known diabetic</li> <li>Recent illness</li> <li>Sick contacts</li> <li>Trauma</li> <li>Possible toxic ingestion</li> <li>Past medical history</li> <li>Medications</li> <li>History of trauma</li> <li>PO intake</li> <li>Last wet diaper/urine</li> </ul>	<b>Signs/Symptoms:</b> <ul style="list-style-type: none"> <li>Decreased mental status</li> <li>Change in baseline mental status</li> <li>Bizarre behavior</li> <li>Hypoglycemia (cool, diaphoretic skin)</li> <li>Hyperglycemia (warm, dry skin; fruity breath; Kussmaul resps; signs of dehydration)</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>Head trauma</li> <li>CNS (tumor, seizure, infection)</li> <li>Infection</li> <li>Shock (septic, metabolic, traumatic)</li> <li>Diabetes (hyper / hypoglycemia)</li> <li>Toxicologic/CO Poisoning</li> <li>Acidosis / Alkalosis</li> <li>Environmental exposure</li> <li>Pulmonary (Hypoxia)</li> <li>Electrolyte abnormality</li> </ul>
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**Universal Patient Care Protocol U2**  
**Consider Spinal Precautions Protocol U4**

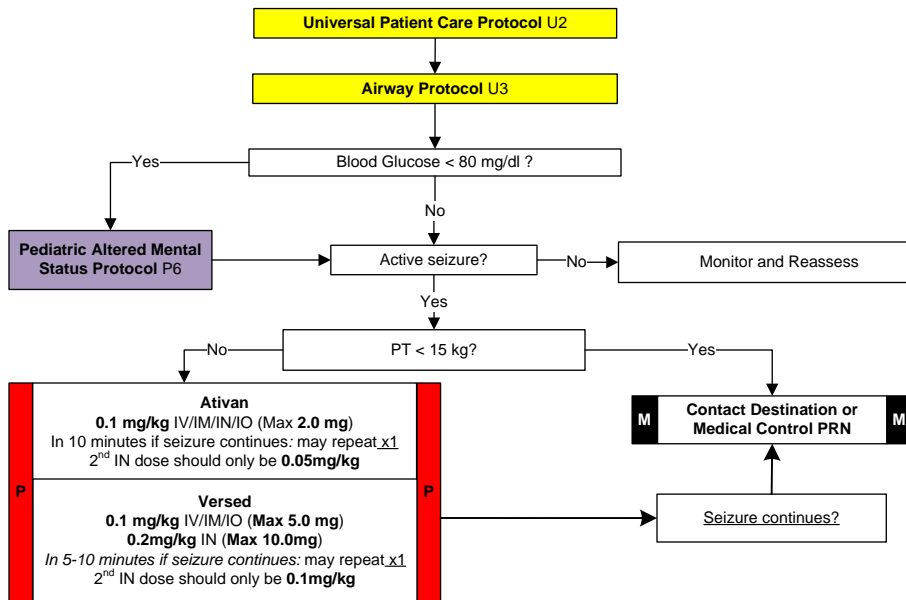
**Glucose Assessment Procedure**  
 CP6



**Pearls:**

- Children: Low glucose <60 mg/dl, normal glucose 60 – 100 mg/dl, Newborn: Low glucose <40, normal 40-80 mg/dl.
- Be aware of AMS as presenting sign of an environmental exposure or toxin, consider RAD-57.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Patents on oral hypoglycemics or long-acting insulin are at risk for repeat episodes of hypoglycemia, monitor closely and encourage transport.
- D10 administration should be flushed well with fluid.
- Administration of Naloxone may cause withdrawal symptoms and should not be used in newly born.

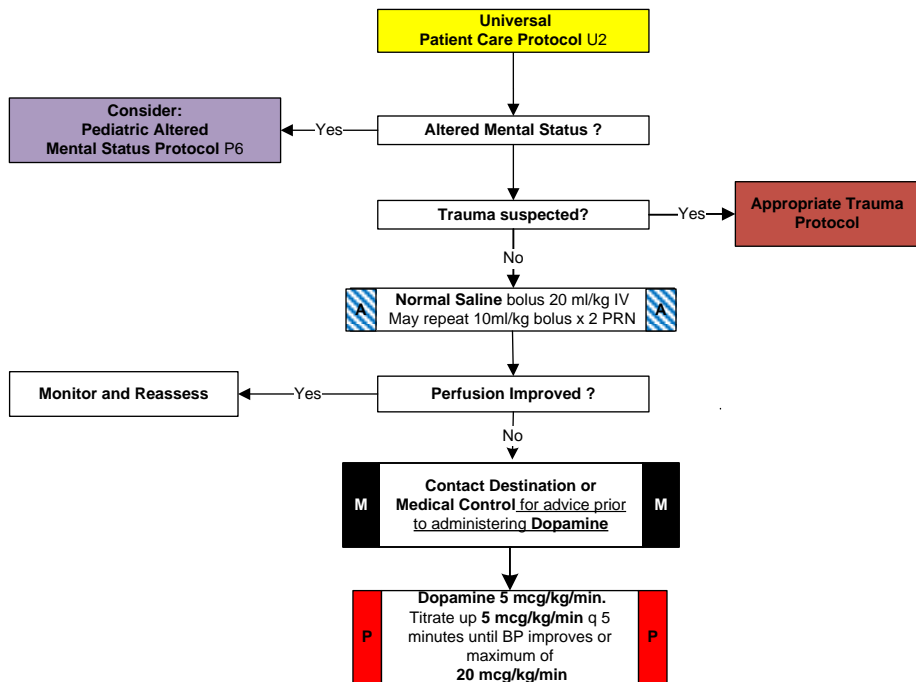
<b>History:</b> <ul style="list-style-type: none"> <li>Sick contacts</li> <li>Prior history of seizures</li> <li>Medication compliance</li> <li>Recent head trauma</li> <li>Whole body vs unilateral seizure activity</li> <li>Duration</li> <li>Single/multiple</li> </ul>	<b>Signs &amp; Symptoms:</b> <ul style="list-style-type: none"> <li>Febrile or flushed</li> <li>Tonic phase -body stiffening</li> <li>Clonic phase -body jerking</li> <li>Incontinence</li> <li>Tongue trauma</li> <li>Rash</li> <li>Nuchal rigidity</li> <li>Altered mental status</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>Febrile seizure</li> <li>Infection</li> <li>Head trauma</li> <li>Medication or Toxin</li> <li>Hypoxia or Respiratory failure</li> <li>Hypoglycemia</li> <li>Metabolic abnormality / acidosis</li> <li>Tumor</li> </ul>
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### Pearls:

- Addressing the ABCs and verifying blood glucose is more important than stopping the seizure.
- Be prepared to assist ventilations especially if a benzodiazepine is used. Avoiding hypoxemia is extremely important.
- In an infant, a seizure may be the only evidence of a closed head injury.
- Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neuro
- Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery. This is a true emergency requiring rapid airway control, treatment, and transport.
- Grand mal seizures (generalized) are associated with loss of consciousness, incontinence, and tongue trauma.
- Focal seizures (petit mal) effect only a part of the body and are not usually associated with a loss of consciousness
- If the patient is in a school setting and has documentation to provide treatment for the seizure with diazepam you may substitute and use **Versed as above**.
- Assess possibility of occult trauma and substance abuse. If evidence or suspicion of trauma, use spinal immobilization.
- Versed is to be titrated to effect with SBP >70 + (age in years x 2) mmHg or peripheral pulses present.
- Recent studies have shown nasal medication administration may be faster at controlling seizures than IV/IM.

<b>History:</b> <ul style="list-style-type: none"> <li>• Vomiting</li> <li>• Diarrhea</li> <li>• Fever</li> <li>• Infection</li> <li>• Sick contacts</li> <li>• PO intake</li> <li>• Last wet diaper/urine</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Restlessness, confusion, weakness</li> <li>• Syncope</li> <li>• Tachycardia</li> <li>• Diaphoresis</li> <li>• Pale, cool, clammy skin</li> <li>• Delayed capillary refill</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Infection/Sepsis</li> <li>• Dehydration</li> <li>• Vomiting</li> <li>• Diarrhea</li> <li>• Congenital heart disease</li> <li>• Medication or Toxin</li> <li>• Anaphylaxis</li> </ul>
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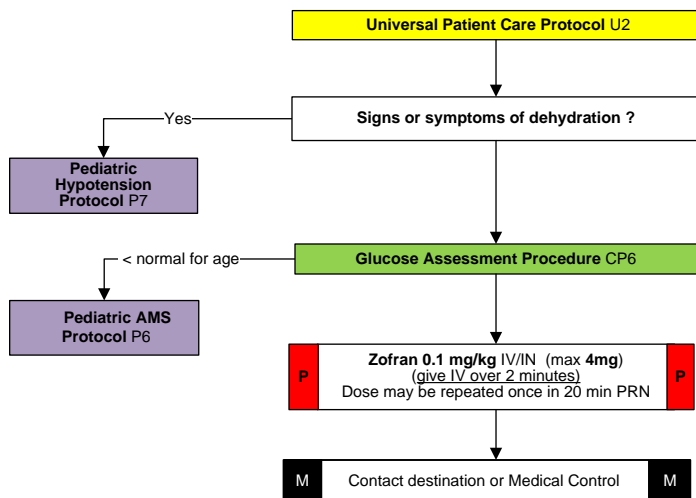


### Pearls:

- Pediatric hypotension is defined as a SBP <70 + (age in years x 2) mmHg
- Consider causes of pediatric hypotension and address per appropriate protocol.
- Patients should always have adequate intravascular fluid load prior to the use of vasopressors.



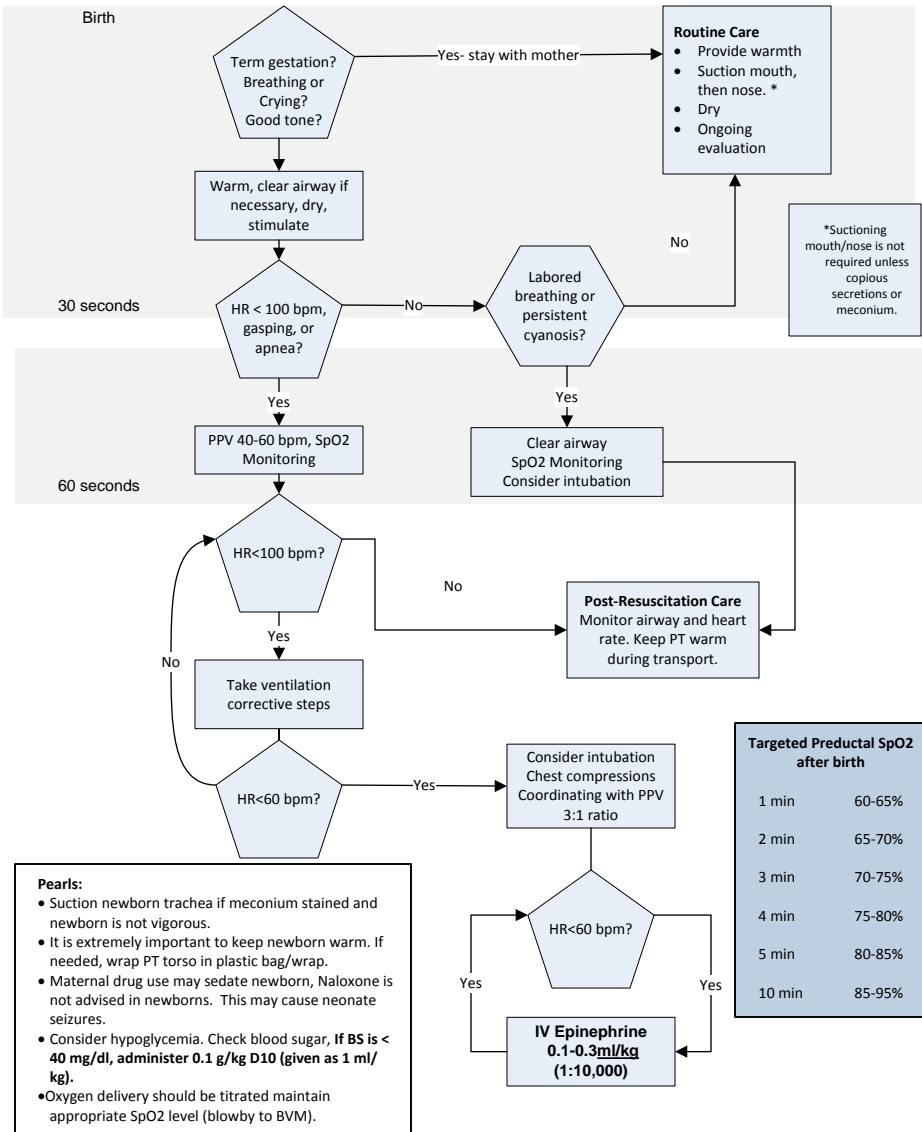
<p><b>History:</b>                  Age                  Time of last meal                  Last bowel movement / emesis                  Improvement or worsening with food or activity                  Other sick contacts                  Past Medical History                  Past Surgical History                  Medications                  Travel history                  Bloody Emesis or diarrhea</p>	<p><b>Signs and Symptoms:</b>                  Pain                  Distension                  Constipation                  Diarrhea                  Anorexia                  Fever                  Cough,                  Dysuria</p>	<p><b>Differential:</b>                  CNS (Increased pressure, headache, tumor, trauma or hemorrhage)                  Drugs                  Appendicitis                  Gastroenteritis                  GI or Renal disorders                  Diabetic Ketoacidosis                  Infections (pneumonia, influenza)                  Electrolyte abnormalities</p>
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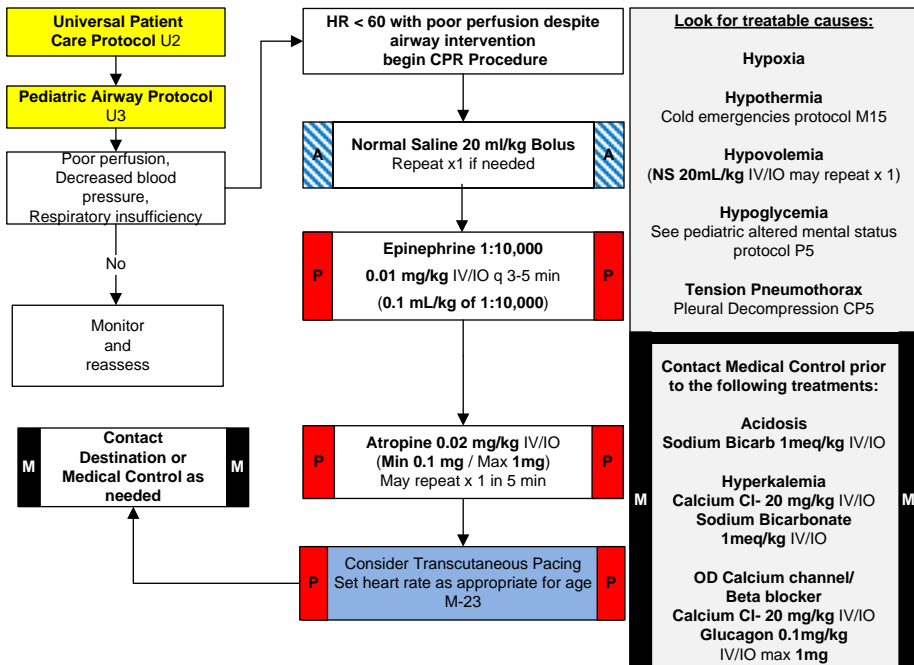
**Pearls:**

- Heart Rate: One of the first clinical signs of dehydration, almost always increased heart rate, tachycardia increases as dehydration becomes more severe, very unlikely to be significantly dehydrated if heart rate is close to normal.
- Zofran, give slow IV push > 2 minutes, given as a single (undiluted) dose.

A fetus  $\geq 20$  weeks is considered a viable patient.



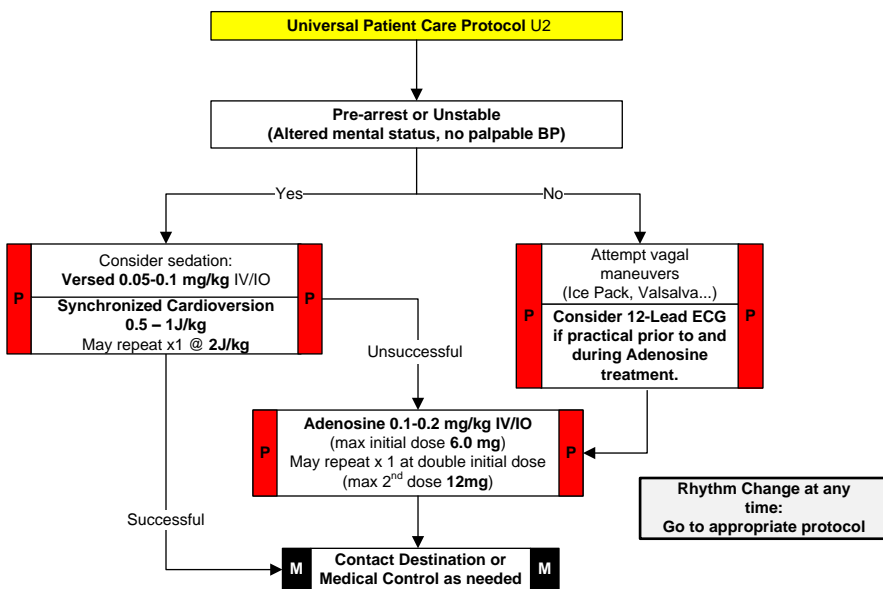
<p><b>History:</b>                  Past Medical History                  Medications                  Events Leading to Current Status</p>	<p><b>Signs &amp; Symptoms:</b>                  HR &lt;60/min with hypotension, acute altered LOC, chest pain, CHF, Sz, syncope or shock secondary to bradycardia                  Altered LOC                  Shock/Hypotension                  Syncope</p>	<p><b>Differential:</b>                  Respiratory effort                  Respiratory obstruction/foreign body                  Secretions                  Croup                  Epiglottitis                  Hypovolemia                  hyperkalemia                  Hypothermia                  Hypoxia                  Infection / Sepsis                  Medication or Toxin                  Hypoglycemia                  Trauma</p>
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**Pearls:**

- Pharmacological treatment of Bradycardia is based upon the presence or absence of symptoms.
- If symptomatic, treat. If asymptomatic, monitor only.
- Consider treatable causes for bradycardia (Beta blocker OD, Calcium channel blocker OD, etc.) - treat appropriately
- Be sure to aggressively oxygenate the patient and support respiratory effort.
- Fluid Bolus to maintain a SBP >70 + (age in years x2) mmHg

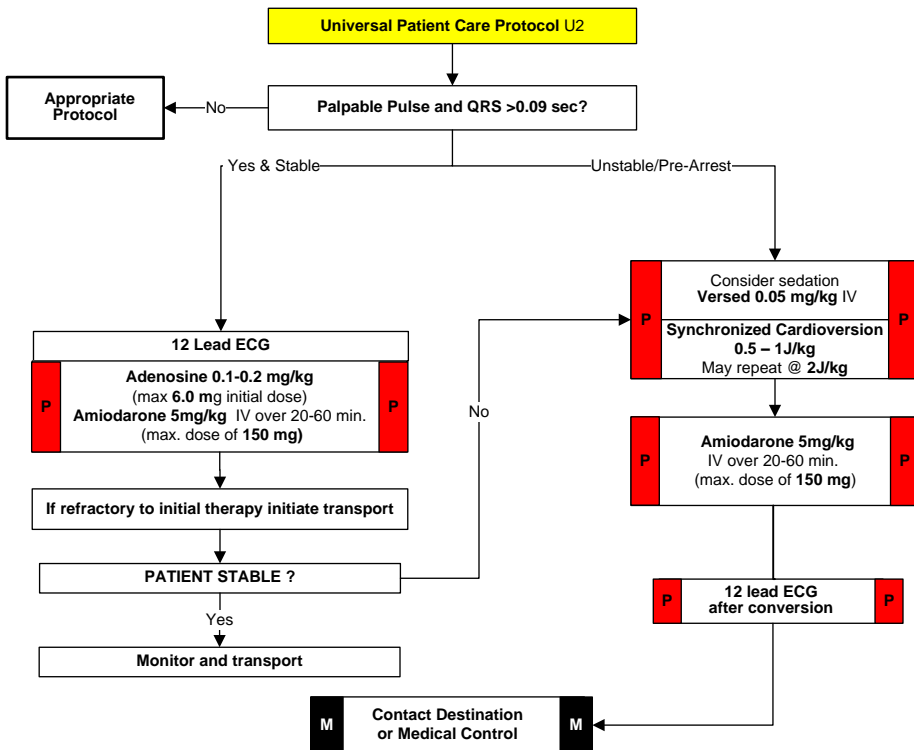
<p><b>History:</b>                  PMH/Medications/Allergies                  Suspected use: Aminophylline,                  Diet pills, Thyroid supplements,                  Decongestants, Digoxin                  Diet (caffeine, chocolate)                  Toxic ingestions                  History of palpitations / heart                  racing                  Syncope / near syncope</p>	<p><b>Signs and Symptoms:</b>                  Heart Rate: Child <math>\geq 180</math>/bpm                  Infant <math>\geq 220</math>/bpm                  Pale or Cyanosis                  Diaphoresis                  Tachypnea                  Vomiting                  Hypotension                  Altered Level of Consciousness                  Pulmonary Congestion                  Syncope</p>	<p><b>Differential:</b>                  Heart disease (WPW, Valvular)                  Electrolyte imbalance                  Exertion, Pain, Emotional stress                  Fever / Infection / Sepsis                  Hypothermia / Hyperthermia                  Hypoxia                  Hypovolemia or Anemia                  Drug effect / Overdose (see Hx)                  Pulmonary embolus                  Trauma / Tension Pneumothorax</p>
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**Pearls:**

- Carefully evaluate the rhythm to distinguish Sinus Tachycardia, Supraventricular Tachycardia and Ventricular Tachycardia.
  - Separating the child from the caregiver may worsen the child's clinical condition.
  - Pediatric Pads should be used according to manufacturer's weight limit.
  - Monitor for respiratory depression and hypotension associated if Benzodiazepine is used.
  - Continuous SpO2 is required for all SVT Patients if available.
  - Document all rhythm changes and therapeutic interventions with monitor strips.
  - A guideline for pediatric heart rates: in infants Sinus Tachycardia is <220, SVT is >220.
- For patients >1yr Sinus Tachycardia is <180 and SVT is >180.

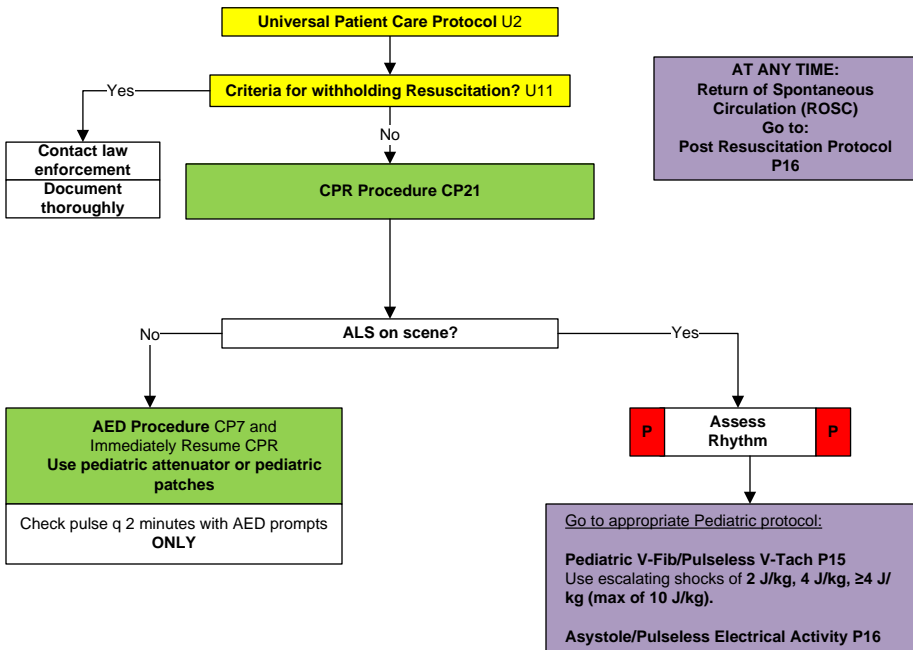
<p><b>History:</b>                  Past medical history / medications, diet, drugs                  Syncope / Near syncope                  Palpitations                  Pacemaker</p>	<p><b>Signs and Symptoms:</b>                  Ventricular Tachycardia on ECG (Runs or Sustained)                  Conscious, rapid pulse                  Chest Pain, Shortness of Breath                  Dizziness                  Rate usually 150-180 bpm for sustained V-Tach                  QRS &gt; 0.12 sec</p>	<p><b>Differential:</b>                  Artifact / Device Failure                  Cardiac                  Endocrine/Electrolyte                  Drugs/Toxic exposure                  Pulmonary disease</p>
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**Pearls:**

- For witnessed/monitored ventricular tachycardia, try having patient cough
- If hyperkalemia or tricyclic OD consider **Sodium Bicarbonate 1 mEq/kg early in intervention, call medical control for orders.**

<b>History:</b> Events leading to arrest Estimated downtime PMH/Medication/Allergies Bystander CPR/AED Existence of terminal illness Foreign Body Airway Obstruction DNR/DNI	<b>Signs and Symptoms:</b> Unresponsive Abnormal breathing (gasps) Pulseless Signs of lividity or rigor Pupils: dilated, sluggish, non-reactive Neuro: unconscious, seizure activity	<b>Differential:</b> Medical vs. Trauma VF vs Pulseless VT Asystole PEA
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- Pearls:**
- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
  - Reassess airway frequently and after every patient move.
  - Immediate and adequate compressions with timely defibrillation are the keys to success. Rotate compressors every 2 minutes to prevent fatigue. Compress chest at least a 1/3 the depth of chest and allow complete recoil.
  - Do not interrupt compressions for airway placement, ventilation, medication administration.
  - If trauma suspected, use spinal immobilization.
  - If scene or pt condition suggests hypothermic arrest go to cold emergencies protocol. Hypothermic patients may appear dead. Time spent assessing respiratory effort, pulse and viability is valuable.
  - The AHA separates adult and pediatric guidelines by signs of secondary sex characteristics or the onset of puberty.
  - When an AED is used, it should be downloaded into ePCR and a report printed for the physicians.

<p><b>History:</b>                  Events leading to arrest                  Estimated downtime                  Witnessed or unwitnessed                  Bystander CPR/AED use                  PMH/Med/Allergies                  DNR/DNI status                  Existence of terminal illness                  Foreign body obstruction                  Hypothermia</p>	<p><b>Signs &amp; Symptoms:</b>                  Unresponsive                  Absent Pulse                  Absent or agonal breathing                  Pupils: dilated, sluggish, non-reactive                  Skin: pale, cool, cyanotic, mottled                  Neuro: unconscious, seizure activity (initially)</p>	<p><b>Differential:</b>                  Respiratory failure                  Foreign body                  Hyperkalemia                  Infection (croup, epiglottitis)                  Hypovolemia (dehydration)                  Congenital heart disease                  Trauma                  Tension pneumothorax                  Hypothermia                  Toxin or medication                  Hypoglycemia                  Acidosis</p>
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**Pediatric Cardiac Arrest Protocol P14**

**Defibrillation every 2 minutes:**  
 AED or 2 J/kg, 4 J/kg, ≥4 J/kg (max 10 J/kg)  
 resume CPR immediately

**Pediatric Airway Protocol U3**

P	<b>Epinephrine 0.01 mg/kg IV/IO (max 1mg)</b> (0.1 ml/kg of 1:10,000) repeat every 3-5 min	P
P	<b>Amiodarone 5 mg/kg IV/IO</b> may repeat x1	P

P	<b>Assess and treat for any reversible causes. Further orders must come from medical control.</b>	P
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M	<b>Contact Destination or Medical Control as needed</b>	M
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Change in rhythm at any time:  
 Go to appropriate protocol

**Look for treatable causes:**

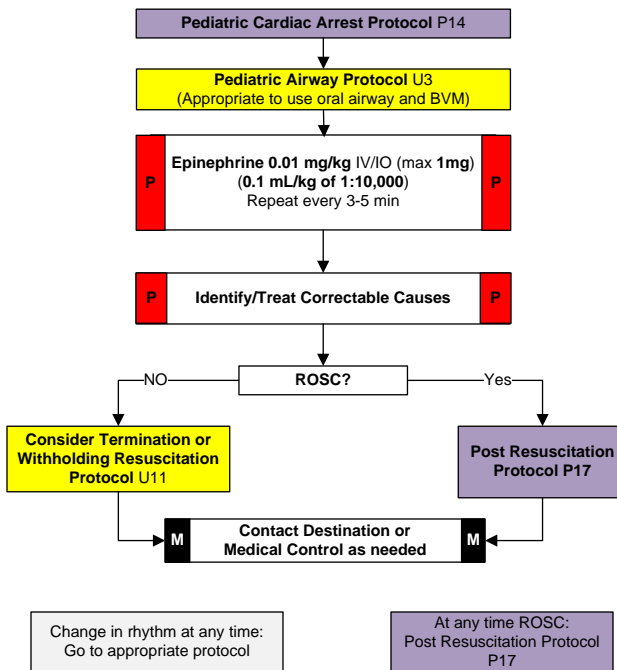
- Hypoxia**
  - Hypothermia**  
Cold emergencies protocol M15
  - Hypovolemia**  
NS 20mL/kg IV/IO may repeat x 1
  - Hypoglycemia**  
D10 1ml/kg  
<30 days D10 5ml/kg
  - Tension Pneumothorax**  
Pleural Decompression CP5
- M Contact Medical Control prior to the following treatments: M**
- Acidosis**  
Sodium Bicarbonate 1meq/kg IV/IO
  - Hyperkalemia**  
Calcium Chloride 20 mg/kg IV/IO  
Sodium Bicarbonate 1meq/kg IV/IO
  - OD Calcium channel/Beta blocker**  
Calcium Chloride 20 mg/kg IV/IO  
Glucagon 0.1mg/kg IV/IO max 1mg

At any time ROSC:  
 Post Resuscitation Protocol P17

**Pearls:**

- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Because the head is proportionally larger, padding under the shoulders or torso will assist in airway management.
- Respiratory arrest is a common cause of cardiac arrest. Unlike adults, early ventilation intervention is critical and key to resuscitation.
- In most cases pediatric airways can be managed by basic interventions.
- Effective CPR is critical 1) Push hard and fast at appropriate rate 2) Ensure full chest recoil 3) Minimize interruptions in CPR.
- Try to administer first Epi within 3 minutes.

<p><b>History:</b>                  Events leading to arrest                  Estimated downtime                  PMH/Medications/Allergies                  Existence of terminal illness                  Foreign Body Airway Obstruction                  Hyperthermia</p>	<p><b>Signs &amp; Symptoms:</b>                  Unresponsive                  Cardiac Arrest                  Absent Pulse                  Absent or agonal breathing                  Pupils: dilated, sluggish, non-reactive                  Neuro: unconscious, seizure activity (initially)                  Signs of lividity or rigor</p>	<p><b>Differential:</b>                  Respiratory failure                  Foreign body                  Hyperkalemia                  Infection (croup, epiglottitis)                  Hypovolemia (dehydration)                  Congenital heart disease                  Trauma                  Tension pneumothorax                  Hypothermia                  Toxin or medication                  Hypoglycemia                  Acidosis</p>
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**Look for treatable causes:**

- Hypoxia**
- Hypothermia**  
Cold emergencies protocol M15
- Hypovolemia**  
NS 20mL/kg IV/IO may repeat x 1
- Hypoglycemia**  
D10 1mL/kg  
<30 days D10 5mL/kg
- Tension Pneumothorax**  
Pleural Decompression CP5

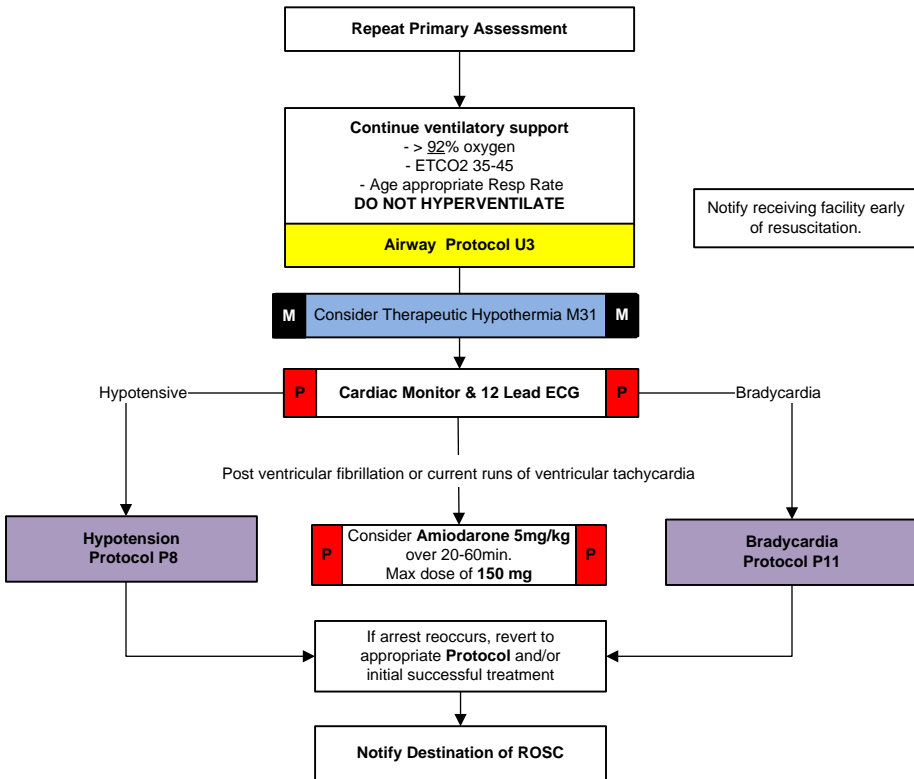
**Contact Medical Control prior to the following treatments:**

- Acidosis**  
Sodium Bicarbonate 1meq/kg IV/IO
- Hyperkalemia**  
Calcium Chloride 20 mg/kg IV/IO  
Sodium Bicarbonate 1meq/kg IV/IO
- OD Calcium channel/  
Beta blocker**  
Calcium Chloride 20 mg/kg IV/IO  
Glucagon 0.1mg/kg  
IV/IO max 1mg

- Pearls:**
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
  - Respiratory arrest is a common cause of cardiac arrest. Unlike adults early airway intervention is critical.
  - Because the head is proportionally larger, padding under the shoulders or torso will assist in airway management.
  - In most cases pediatric airways can be managed by basic interventions.
  - Effective CPR is critical** 1) Push hard and fast at appropriate rate, 100/min 2) Ensure full chest recoil 3) Minimize interruptions in CPR. Pause CPR <10 seconds to verify rhythm.
  - Always confirm asystole in more than one lead.
  - Try to administer first Epi within 3 minutes.



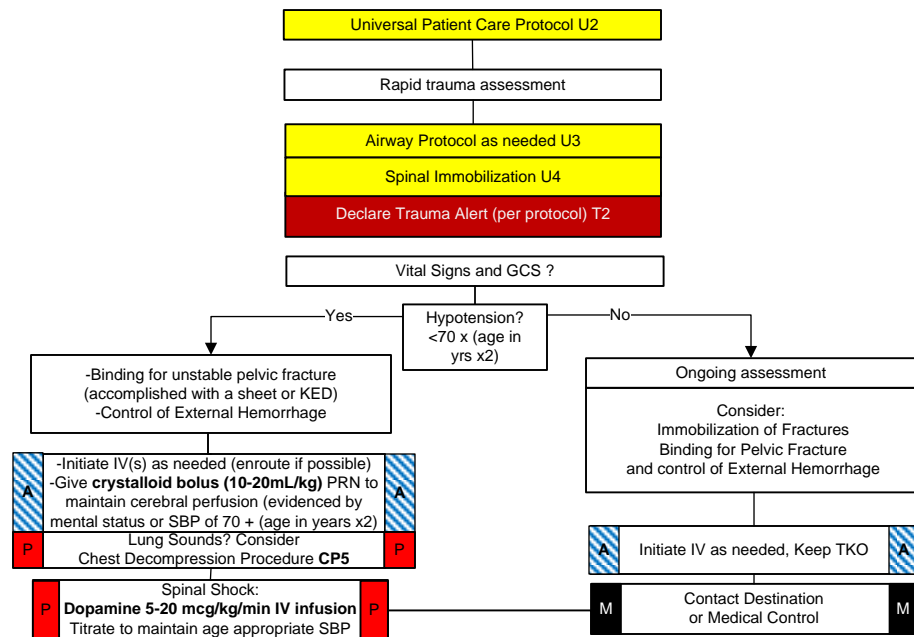
<b>History</b> <ul style="list-style-type: none"> <li>Respiratory Arrest</li> <li>Cardiac Arrest</li> </ul>	<b>Signs &amp; Symptoms</b> <ul style="list-style-type: none"> <li>Return of pulse</li> </ul>	<b>Differential</b> <ul style="list-style-type: none"> <li>Continue to address specific differentials associated with original dysrhythmia</li> </ul>
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### Pearls:

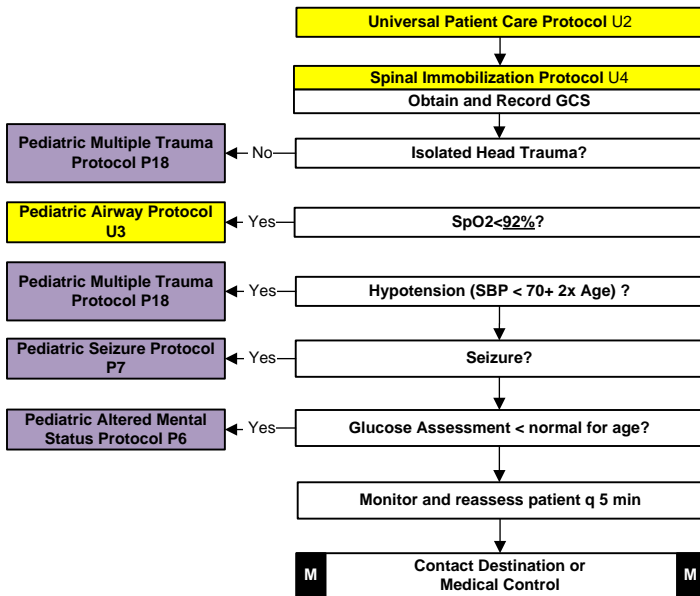
- Hyperventilation is a significant cause of hypotension and cardiac arrest in the post resuscitation phase it must be avoided at all cost.
- Most patients immediately post resuscitation will require ventilatory assistance.
- The condition of post-resuscitation patients fluctuates rapidly and continuously, and they require close monitoring. Appropriate post resuscitation management can best be planned in consultation with medical control.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Significant ectopy is defined as a dysrhythmia that meets treatment criteria as part of another protocol (i.e. SVT, V-Tach)

<p><b>History:</b></p> <p>Time and mechanism of injury          Damage to structure or vehicle          Location in structure or vehicle          Others injured or dead          Speed and details of MVC          Restraints / protective equipment          Past medical history          Medications</p>	<p><b>Signs &amp; Symptoms:</b></p> <p>Pain, swelling          Deformity, lesions, bleeding          Altered mental status or unconscious          Hypertension or shock          Arrest</p>	<p><b>Differential (Life threatening):</b></p> <p>Chest: Tension pneumothorax          Flail chest          Pericardial tamponade          Open chest wound          Hemothorax</p> <p>Intra-abdominal bleeding          Pelvis / Femur fracture          Spine fracture / Cord injury          Head injury (see Head Trauma)          Extremity fracture / Dislocation          HEENT (Airway obstruction)          Hypothermia</p>
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- Pearls:**
- If patient meets Trauma Alert criteria interventions should be performed enroute. Minimize scene time to <10 minutes.
  - Consider Chest Decompression with signs of shock and injury to torso and evidence of tension pneumothorax.
  - See Trauma Alert Protocol
  - Severe bleeding from an extremity not rapidly controlled with direct pressure may necessitate the application of a tourniquet
  - Record "Trauma Alert" in patient record.
  - Permissive hypotension should be used in the absence of neurologic injury. If suspected neurologic injury maintain age appropriate SBP: 70 + (age in years x2).
  - Do not overlook the possibility of child abuse.

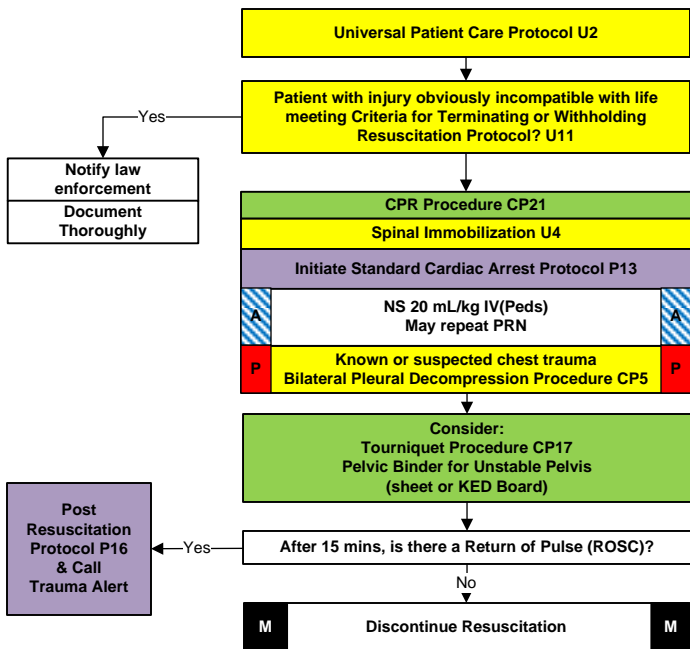
<p><b>Histry</b></p> <ul style="list-style-type: none"> <li>Time of injury</li> <li>Mechanism: blunt / penetrating</li> <li>Loss of consciousness</li> <li>Bleeding</li> <li>History of bleeding disorders</li> <li>Medications</li> <li>Evidence of multi-trauma</li> <li>Protective equipment</li> <li>Helmet use or damage to helmet</li> </ul>	<p><b>Signs and Symptoms:</b></p> <ul style="list-style-type: none"> <li>Pain, swelling, bleeding</li> <li>Altered mental status</li> <li>Unconscious</li> <li>Respiratory distress / failure</li> <li>Vomiting</li> <li>Major traumatic mechanism of injury</li> <li>Seizure</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>Skull fracture</li> <li>Brain injury (Concussion, Contusion, Hemorrhage or Laceration)</li> <li>Epidural hematoma</li> <li>Subdural hematoma</li> <li>Subarachnoid hemorrhage</li> <li>Spinal injury</li> <li>Abuse</li> </ul>
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### Pearls:

- Hyperventilate the patient only if evidence of herniation (blown pupil, decorticate / decerebrate posturing, bradycardia). If hyperventilation is needed (35/minute for infants <1 year and 25/minute for children >1 year). If ETCO2 available titrate to 30-35mmHg.
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury.
- It is essential to monitor and document baseline mental status and any change in the level of consciousness.
- Concussions are periods of confusion or LOC associated with trauma which may have resolved by the time EMS arrives. Any documented loss of consciousness, prolonged confusion or mental status abnormality should be evaluated by a physician ASAP.
- Fluids and Medication titrated to maintain a SBP >70 + (age in years x 2) mmHg**

<b>History:</b> <ul style="list-style-type: none"> <li>• Patient who has suffered traumatic injury and is now pulseless</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Evidence of penetrating trauma incompatible with life</li> <li>• Evidence of blunt trauma incompatible with life</li> <li>• Decapitation</li> <li>• Decomposition</li> <li>• Completely charred body without detectable signs of life</li> <li>• Dependent lividity or rigor mortis</li> <li>• Hemitorporectomy</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Medical condition preceding traumatic event as cause of arrest.</li> <li>• Tension Pneumothorax</li> <li>• Hypovolemic Shock</li> <li>• External hemorrhage</li> <li>• Unstable pelvic fracture</li> <li>• Displaced long bone fracture(s)</li> <li>• Hemothorax</li> <li>• Intra-abdominal hemorrhage</li> <li>• Retroperitoneal hemorrhage</li> </ul>
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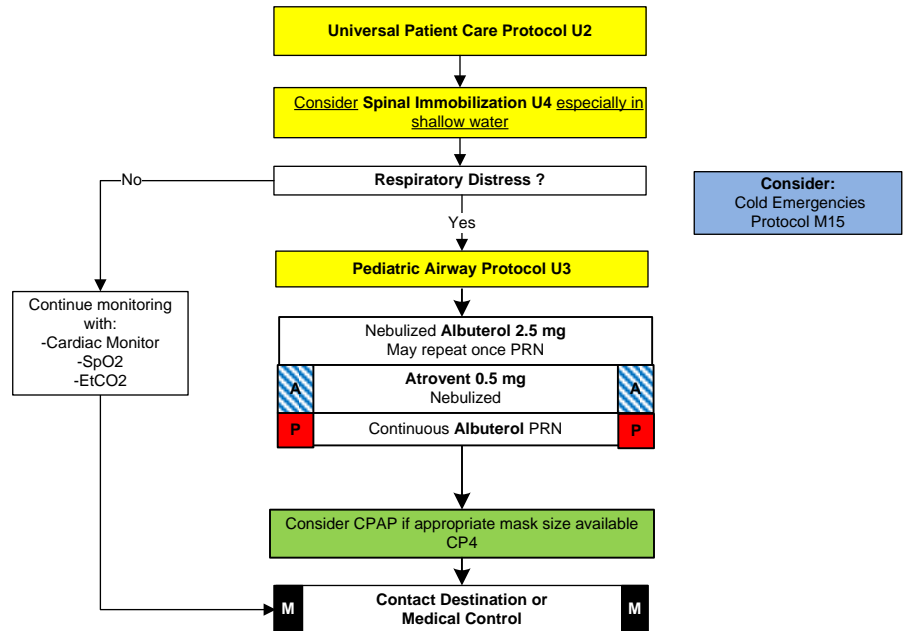


### Discontinuation/No initiation of Resuscitation:

- Injuries obviously incompatible with life (decapitation, incineration, obvious destruction of vital organs of torso/head)
- Patients with suspected traumatic mechanism found pulseless and apneic by first provider on scene with no respiratory effort after following appropriate medical interventions which may include: BVM, intubation, release of a tension pneumothorax **AND** lack of organized electrical activity on ECG with rate <40 BPM.
- Drowning with submersion > 60 minutes from arrival of first Public Safety entity to patient in position for resuscitation.

Consider using medical cardiac arrest protocols if uncertainty exists regarding medical or traumatic cause of arrest. Mass Casualty incidents (MCI) are not covered by this protocol.

<p><b>History:</b></p> <ul style="list-style-type: none"> <li>• Submersion in water regardless of depth</li> <li>• Possible history of trauma ie: diving board</li> <li>• Duration of immersion</li> <li>• Temperature of water</li> <li>• Fresh/Salt Water</li> </ul>	<p><b>Signs and Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Unresponsive</li> <li>• Mental status changes</li> <li>• Decreased or absent vital signs</li> <li>• Vomiting</li> <li>• Coughing</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Trauma</li> <li>• Pre-existing medical problem</li> <li>• Pressure injury (diving)             <ul style="list-style-type: none"> <li>-Barotrauma</li> <li>-Decompression sickness</li> </ul> </li> </ul>
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<p><b>Pearls:</b></p> <ul style="list-style-type: none"> <li>• Criteria for resuscitation includes suspected arrest from cause other than submersion, patient submersion time less than 60 minutes from arrival of the first Public Safety entity until the patient is in a position for resuscitative efforts to be initiated. On-scene rescuers should consider conversion from rescue to recovery at 60 minutes unless the patient is a diver with an air source or a patient trapped with a potential air source. Final decision for transition from rescue to recovery mode rests with medical control and on-scene command.</li> <li>• All victims should be transported for evaluation due to potential for worsening over the next several hours.</li> <li>• Drowning is a leading cause of death among would-be rescuers. Allow appropriately trained rescuers to remove victims from areas of danger.</li> <li>• Consider CPAP early if respiratory distress for any age if adequate mask seal can be established.</li> </ul>
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**Standard:**

To provide a safe method of transporting pediatric patients within an ambulance and protect the EMS system and personnel from potential harm and liability associated with the transportation of pediatric patients.

**Purpose:**

Without special considerations children are at risk of injury when transported by EMS. EMS must provide appropriate stabilization and protection to pediatric patients during EMS transport.

**Application:**

- Drive cautiously at safe speeds observing traffic laws unless patient condition requires emergent transport in accordance with operational standards on emergency response/transport.
- Tightly secure all monitoring devices and other equipment.
- Ensure that all pediatric patients are restrained with an approved child restraint device secured as per manufacturer's instructions if not secured by other means as part of patient care. May use the child's own safety seat if it has not been involved in significant impact.
  - a. Inflatable seats can hold pt 20-40 lbs.
  - b. Ferno Pedi-mate can hold pt 10-40lbs.
  - c. Car seat in captain's seat, refer to manufacturer's directions for weight limit.
- Do not transport the pediatric patient who meets trauma activation criteria in a child seat.
- Ensure that all EMS personnel use the available restraint systems during transport when not otherwise engaged in patient care activities.
- Transport adults and children who are not patients, properly restrained, in an alternate passenger vehicle, whenever possible. A second child can be secured in a child restraint device in the captain's chair in the ambulance.
- Do not allow parents, caregivers, or other passengers to be unrestrained during transport.
- Allowing a child under the age of 13 to sit in the passenger seat should be considered with caution due to the airbag.
- Do not hold or allow the parents or caregivers to hold the patient during transport. Recommended skin to skin contact with mother to keep patient warm and reduce chances of hypothermia.
- For patients with medical conditions that may be aggravated by stress, make every attempt to optimize safety when comforting the child.

# Trauma Protocols

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For purposes of these protocols, adult patients are defined as greater than 37kg  
(approx 80lbs)



### History:

- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints/Airbags/Helmets
- Past medical history
- Medications (Beta blocker? Blood thinners?)

### Signs & Symptoms:

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status or unconscious
- Hypotension or shock
- Cardiac Arrest

### Differential (Life threatening):

- Chest
  - Tension pneumothorax
  - Flail chest
  - Pericardial tamponade
  - Open chest wound
  - Hemothorax
- Intra-abdominal bleeding
- Pelvis / Femur fracture
- Spine fracture / Cord injury
- Head injury (see Head Trauma)
- Extremity fracture / Dislocation
- HEENT (Airway obstruction)
- Hypothermia

Universal Patient Care Protocol U2  
w/rapid trauma assessment

Airway Protocol as needed U3

Spinal Precautions U4

Declare Trauma Alert (per Protocol) T2

Vital Signs, ECG monitor, and GCS ?

SBP < 90 mmHg

SBP ≥ 90 mmHg

- Binding for unstable pelvic fracture (accomplished with a sheet, pelvic binder, KED)  
- Control of External Hemorrhage

**Consider:**  
**Tourniquet Procedure CP17**

- Initiate IV(s) as needed (enroute if possible)
- Give **250 ml crystalloid bolus** as needed to maintain permissive hypotension guidelines (SBP of ≥90 and mental status)

If patient meets criteria, administer TXA 1 gm over 10 min. Reference special directions in drug formulary. Flush IV thoroughly after TXA.

**Consider:**  
**Pleural Decompression Procedure CP5**

**Spinal Shock (without hypovolemia):**  
**Dopamine 5-20 mcg/kg/min IV infusion**  
Titrated to maintain a SBP ≥ 90 mmHg

### Ongoing assessment

**Consider:**  
- Immobilization of Long Bone Fracture  
- Binding for Pelvic Fracture  
- and control of External Hemorrhage

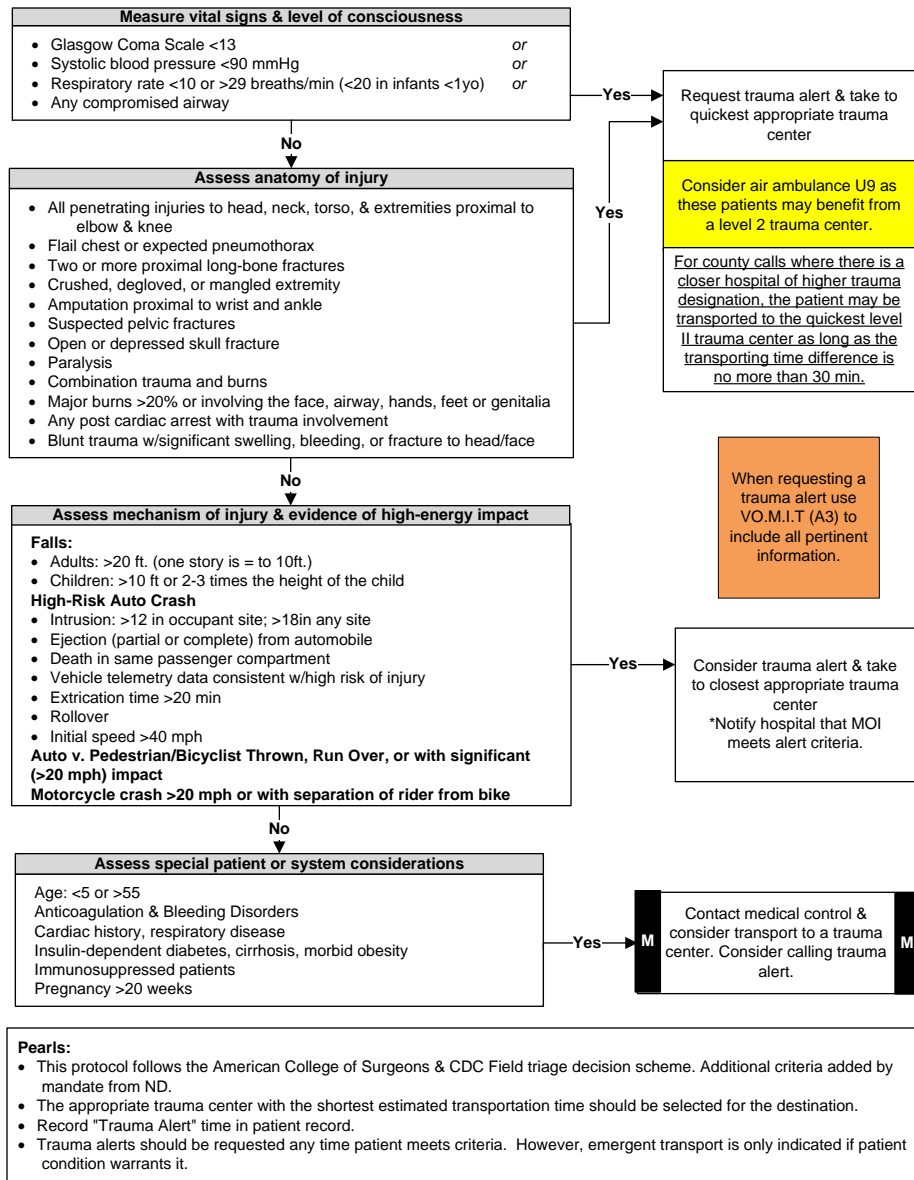
**Pain Management as needed U8**

- Initiate IV(s) as needed (enroute if possible)
- IV's should be kept TKO unless SBP <90 (for adults)

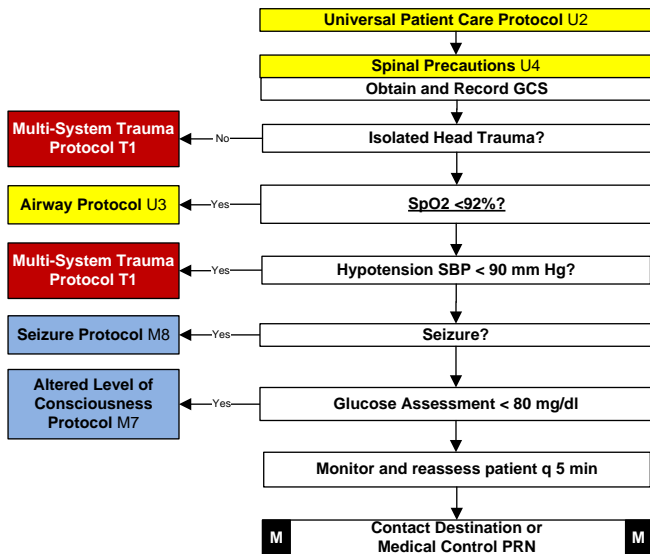
**Contact Destination or Medical Control**

### Pearls:

- Consider Chest Decompression with signs of shock and diminished/absent breath sounds. If patient arrests perform bilateral decompression.
- If patient meets Trauma Alert, critical interventions should be performed enroute. Minimize scene time.
- Severe bleeding from an extremity not rapidly controlled by direct pressure may necessitate the application of a tourniquet
- Record "Trauma Alert" in patient record.
- Permissive hypotension should be used in the absence of neurologic injury. If suspected neurologic injury maintain SBP ≥ 90.



<p><b>History:</b></p> <ul style="list-style-type: none"> <li>• Time of injury</li> <li>• Mechanism: blunt / penetrating</li> <li>• Loss of consciousness</li> <li>• Bleeding</li> <li>• Medical history</li> <li>• Medications</li> <li>• Allergies</li> <li>• Evidence of multi-trauma</li> <li>• Helmet use or damage to helmet</li> </ul>	<p><b>Signs and Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Pain, swelling, bleeding</li> <li>• Altered mental status</li> <li>• Unconscious</li> <li>• Respiratory distress / failure</li> <li>• Vomiting</li> <li>• Significant mechanism of injury</li> <li>• Pupillary abnormalities</li> <li>• CSF leaking from ears, nose, mouth</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Skull fracture</li> <li>• Brain injury (concussion, contusion, hemorrhage, or laceration)</li> <li>• Epidural/subdural hematoma</li> <li>• Alcohol Intoxication</li> <li>• Subarachnoid/intracranial hemorrhage</li> <li>• Spinal injury</li> <li>• Abuse</li> </ul>
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**Pearls:**

- If evidence of brain herniation (blown pupil, Cushing's reflex, rapid decline in GCS, or bradycardia,) carefully hyperventilate the patient and titrate to adult ETCO2 30 - 35 mmHg.
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response), keep patients ETCO2 approximately 35mmHg to prevent this.
- If hypotension consider spinal shock or additional occult injury as source.
- Hypotension is devastating to neurologic injury and should be aggressively treated.
- Consider Altered Mental Status Protocol
- The most important item to monitor and document is a change in the level of consciousness and GCS.
- Consider Restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- Concussions are periods of confusion or LOC associated with trauma which may have resolved by the time EMS arrives. Any documented loss of consciousness, prolonged confusion or mental status abnormality should be evaluated by a physician ASAP.

- The following was developed in conjunction with Sanford Health Athletic Training. While this specifically describes football equipment, the national recommendation is that “protective athletic equipment should be removed prior to transport to an emergency facility for an athlete-patient with suspected cervical spine instability.”
- EMS crews should always work with athletic trainers to help determine the best method of removal and/or transport for a sports injury.

## Football Equipment Removal

Equipment Needed:

- Screwdriver (preferably electric)
- Air Valve with Needle
- Towels
- Scissor or Knife to Cut Jersey or Straps
- Requires at least 3 trained rescuers

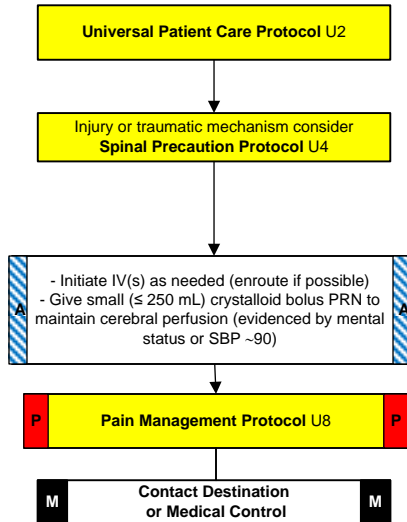
### When Patient is Prone:

If athlete is prone, cut jersey and posterior shoulder pad straps (and if necessary, lumbar or kidney pad straps) **before** log rolling. Then follow supine procedure.

### When Patient is Supine:

1. Stabilize and Head and Neck—Top Person
2. Use needle to remove air from helmet bladders (2<sup>nd</sup> person). If Zenith helmet, cut chinstraps. If Schutt or older/other model with snap-in cheek pads, remove cheek pads with tongue depressor or other flat device.
3. Remove Lower Face Mask Clips (2<sup>nd</sup> person)
4. (Optional) Remove upper Face Mask Clips and Remove Facemask.
5. Second person Stabilize Lower Jaw and Neck
6. Top Person Slowly slide off helmet. Do not pull out on ear holes to prevent the helmet from compressing at the crown.
7. 3<sup>rd</sup> person—slide towels under head/neck to maintain alignment as helmet is removed.
8. Top Person retakes stabilization
9. Cut jersey and remove
10. 2<sup>nd</sup> or 3<sup>rd</sup> person cut anterior shoulder pad restraints and side straps.
11. 2<sup>nd</sup> and 3<sup>rd</sup> person pull shoulder pads apart and slide off towards the head.
12. 2<sup>nd</sup>/3<sup>rd</sup> person remove towels and apply cervical collar.

<p><b>History</b></p> <ul style="list-style-type: none"> <li>• Age</li> <li>• Past medical history</li> <li>• Past surgical history</li> <li>• Medications</li> <li>• Previous back injury</li> <li>• Traumatic mechanism</li> <li>• Fever</li> <li>• Urinary retention or incontinence of urine/stool</li> <li>• Saddle paresthesia</li> </ul>	<p><b>Signs &amp; Symptoms</b></p> <ul style="list-style-type: none"> <li>• Pain (para spinous, spinous process)</li> <li>• Swelling</li> <li>• Pain with range of motion</li> <li>• Extremity weakness</li> <li>• Extremity numbness</li> <li>• Shooting pain into an extremity</li> <li>• Bowel / bladder dysfunction</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Muscle spasm / strain</li> <li>• Herniated disc with nerve compression</li> <li>• Sciatica</li> <li>• Spine fracture</li> <li>• Kidney stone</li> <li>• Pyelonephritis (Kidney infection)</li> <li>• Aneurysm</li> <li>• Pneumonia</li> <li>• Cardiac related</li> <li>• Cauda equina</li> <li>• Epidural abscess</li> </ul>
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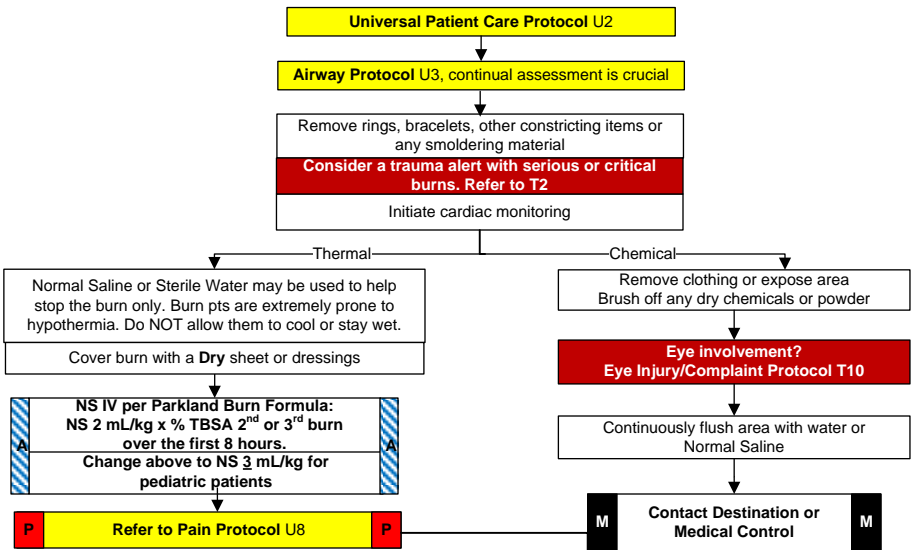


**Pearls:**

- Abdominal aneurysms are a concern in patients over the age of 50
- Any new bowel or bladder incontinence is a significant finding which requires immediate medical evaluation
- In patient with history of IV drug abuse or pain management injections a spinal epidural abscess should be considered.

<b>History:</b> Type of exposure (heat, gas, chemical) Inhalation injury Time of Injury Past medical history and Medications Other trauma Loss of Consciousness Tetanus/Immunization status	<b>Signs &amp; Symptoms:</b> Burns, pain, swelling Dizziness Loss of consciousness Hypotension/shock Airway compromise/distress singed facial or nasal hair, hoarseness / wheezing	<b>Differential:</b> Superficial (1°) red and painful Partial thickness (2°) blistering Full thickness (3°) painless and charred or leathery skin Chemical Thermal Electrical Radiation
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<b>Minor Burn:</b> <5% TBSA Partial Thickness or any isolated Superficial Burn <ul style="list-style-type: none"> <li>No inhalation injury</li> <li>Not intubated</li> <li>Normotensive</li> <li>GCS of 14 or greater</li> </ul>	<b>Serious Burn:</b> <5-15% TBSA Partial Thickness or <5% TBSA Full Thickness <ul style="list-style-type: none"> <li>Suspected inhalation injury</li> <li>Requiring intubation for airway stabilization</li> <li>Hypotension</li> <li>GCS of 13 or less</li> </ul>	<b>Critical Burn:</b> >15% TBSA Partial Thickness or ≥5% TBSA Full Thickness Burn <ul style="list-style-type: none"> <li>Burns w/multiple trauma</li> <li>Burns w/definitive airway compromise</li> </ul>
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<b>Pearls:</b> <ul style="list-style-type: none"> <li>Evaluate BSA : Use chart on T6b or use one side of patients hand = 1% BSA</li> <li>Potential CO exposure should be treated with 100% oxygen. Refer to <b>SC2</b>.</li> <li>Potential Cyanide poisoning consider Cyanokit if available. Refer to <b>SC12</b></li> <li>Do not overlook the possibility of multiple system trauma with burn injuries. Consider a trauma alert with serious or critical burns.</li> <li>Circumferential burns to extremities are dangerous due to potential vascular compromise 2° to soft tissue swelling.</li> <li>Evaluate and report the possibility of abuse, especially with pattern or circumferential burns.</li> <li>IM meds should not be given through a burn. However, an IO can be established through a burn if no other site is available.</li> <li>Pediatric patients tend to have a shorter half-life with narcotics and may need additional doses of Fentanyl. Contact Medical Control.</li> </ul>
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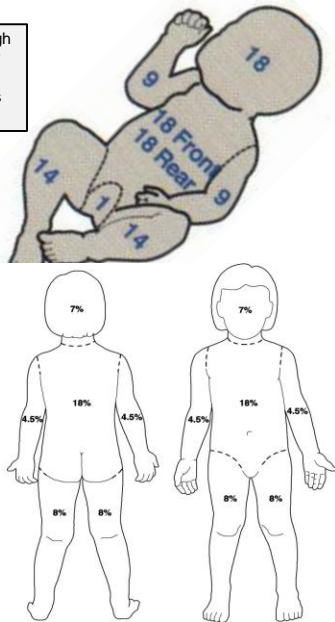
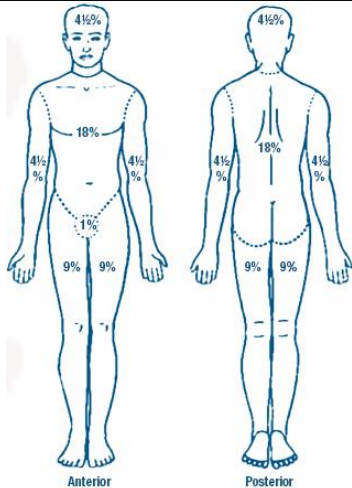
**Electrical Burn Pearls:**

- Lightning strikes should be treated as electrical burns, blast injuries, and multiple traumas due to the extreme forces produced.
- Cardiac arrests are often easily resuscitated with defibrillation attempts with resultant good neurologic outcomes, therefore should be triaged as Red in the setting of a mass casualty incident.
- **DO NOT** contact patient until you are certain the source of the electrical shock is disconnected.
- Attempt to locate contact points (generally there will be two or more.) A point where the patient contacted the source and a point(s) where the patient is grounded.
- Sites will generally be full thickness. **Do not refer to as entry and exit sites or wounds.**
- Anticipate ventricular or atrial irregularity including VT, VF, atrial fibrillation and / or heart blocks.
- Attempt to identify the nature of the electrical source (AC / DC), the amount of voltage, and the amperage the patient may have been exposed to during the electrical shock.

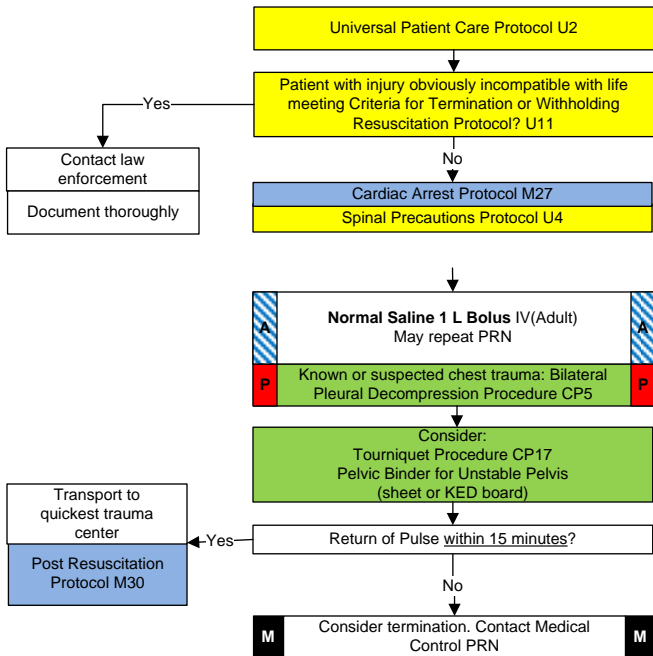
**Chemical Burn Pearls:**

- **Refer to Decontamination Procedure.**
- **Carbolic Acid (phenol)** – This chemical is hydrophobic, therefore will not be efficiently decontaminated by water/ saline irrigation alone.
  - Alcohol (any form) should be used as the initial flush if available, however do not unnecessarily delay copious irrigation with water or saline.
- **Hydrofluoric acid / fluorine gas** – These substances cause extensive tissue destruction due to their ability to penetrate tissues more easily than other substances.
  - All exposures to these chemicals should be considered serious or critical and transported to a burn center for evaluation due to potential delayed toxicity.
  - Calcium ions are readily bound by the fluoride ions, which contributes to pain and possible hemodynamic instability (even cardiac arrest).
  - Pain is an indication of ongoing tissue destruction. Even small areas of exposure can be incredibly painful.
  - If available, Tums ground up and mixed with KY jelly or Milk of Magnesia may be placed on the burn to help with pain control.

The Rule of Nines is commonly used in the prehospital setting to provide a rough estimate of burn injury size. If the burned areas are irregular in shape or widely distributed, an alternate method of estimating the burn area is to visualize the patient's palm as being equal to 1% of body surface area. This is referred to as the "Rule of Palm."



History:	Signs and Symptoms:	Differential:
<ul style="list-style-type: none"> <li>Patient who has suffered traumatic injury and is now pulseless</li> </ul>	<ul style="list-style-type: none"> <li>Evidence of penetrating trauma</li> <li>Evidence of blunt trauma</li> </ul>	<ul style="list-style-type: none"> <li>Medical condition preceding traumatic event as cause of arrest.</li> <li>Tension Pneumothorax</li> <li>Hypovolemic Shock                             <ul style="list-style-type: none"> <li>External hemorrhage</li> <li>Unstable pelvic fracture</li> <li>Displaced long bone fracture(s)</li> </ul> </li> <li>Hemothorax</li> <li>Intra-abdominal hemorrhage</li> <li>Retroperitoneal hemorrhage</li> </ul>

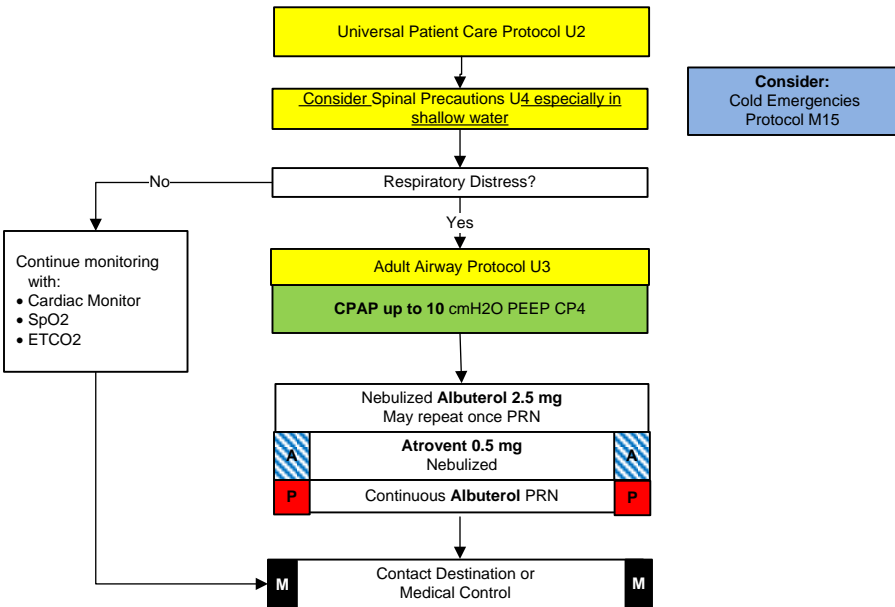


### Discontinuation/No initiation of Resuscitation:

- Injuries obviously incompatible with life (decapitation, incineration, hemicorporectomy, obvious destruction of vital organs of torso/head)
- Patients with suspected traumatic mechanism found pulseless and apneic by first provider on scene with no respiratory effort after following appropriate medical interventions which may include : BVM, intubation, release of a tension pneumothorax **AND** lack of organized electrical activity on ECG with rate <40 BPM.
- Drowning with submersion >60 minutes from arrival of first Public Safety entity to patient in position for resuscitation.
- Consider using medical cardiac arrest protocols if uncertainty exists regarding medical or traumatic cause of arrest.
- Medical Control must be contacted before termination of resuscitation efforts.

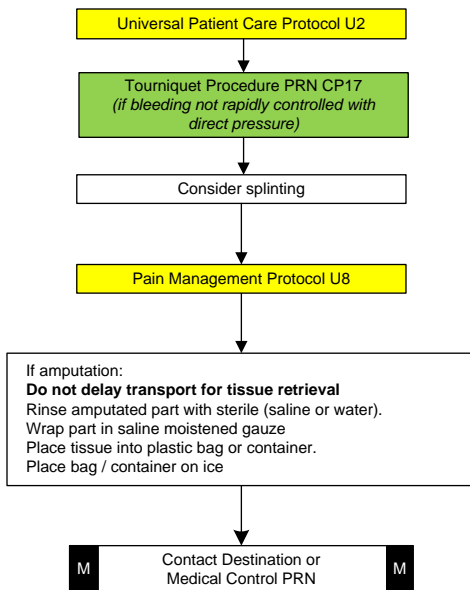


<p><b>History:</b></p> <ul style="list-style-type: none"> <li>Submersion in water regardless of depth</li> <li>Possible history of trauma ie: diving board</li> <li>Duration of immersion</li> <li>Temperature of water</li> </ul>	<p><b>Signs and Symptoms:</b></p> <ul style="list-style-type: none"> <li>Unresponsive</li> <li>Mental status changes</li> <li>Decreased or absent vital signs</li> <li>Vomiting</li> <li>Coughing</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>Trauma</li> <li>Pre-existing medical problem</li> </ul>
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- Pearls:**
- Criteria for resuscitation includes suspected arrest from cause other than submersion, patient submersion time less than 60 minutes from arrival of the first Public Safety entity until the patient is in a position for resuscitative efforts to be initiated. On-scene rescuers should consider conversion from rescue to recovery at 60 minutes unless the patient is a diver with an air source or a patient trapped with a potential air source. Final decision for transition from rescue to recovery mode rests with medical control and on-scene command.
  - All victims should be transported for evaluation due to potential for worsening over the next several hours.
  - Drowning is a leading cause of death among would-be rescuers. Allow appropriately trained rescuers to remove victims from areas of danger.
  - With pressure injuries (decompression / barotrauma), alert receiving facility early of possible need for a hyperbaric chamber.
  - Consider CPAP(CP5) early if respiratory distress for any age if adequate mask seal can be established.

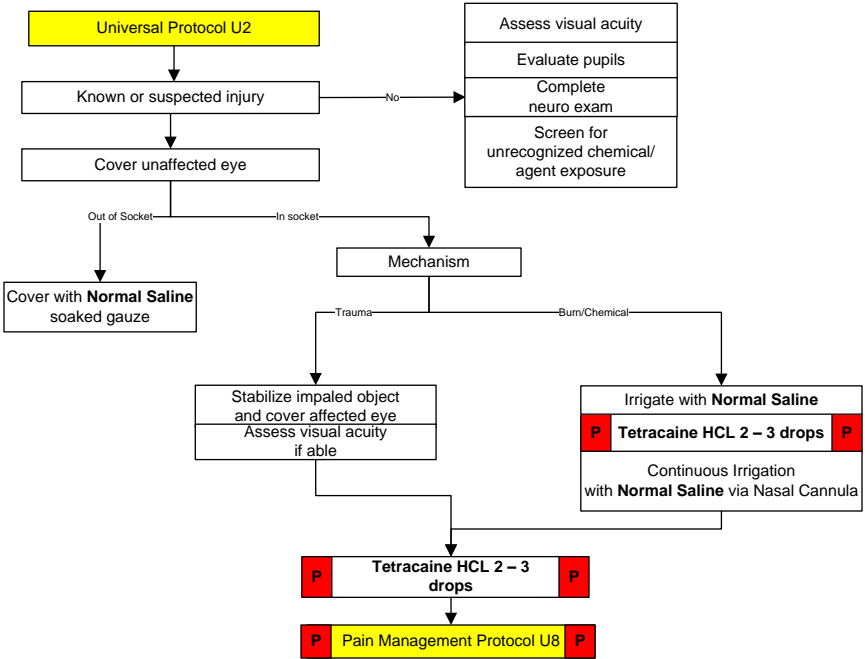
<p><b>History:</b></p> <ul style="list-style-type: none"> <li>• Type of injury</li> <li>• Mechanism: crush / penetrating / amputation</li> <li>• Time of injury</li> <li>• Open vs. closed wound / fracture</li> <li>• Wound contamination</li> <li>• Medical history</li> <li>• Medications</li> </ul>	<p><b>Signs &amp; Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Pain, swelling</li> <li>• Deformity</li> <li>• Altered sensation / motor function</li> <li>• Diminished pulse / capillary refill</li> <li>• Decreased extremity temperature</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Abrasion</li> <li>• Contusion</li> <li>• Laceration</li> <li>• Sprain</li> <li>• Dislocation</li> <li>• Fracture</li> <li>• Amputation</li> </ul>
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**Pearls:**

- Peripheral neurovascular status should be documented on all extremity injuries and before and after splinting procedures.
- If pulseless extremity a single attempt at realignment may be performed.
- In amputations, time is critical. Transport and notify medical control immediately, so that the appropriate destination can be determined.
- If an amputation is incomplete, splint affected digit or limb in physiologic position.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise.
- Urgently transport any injury with vascular compromise and be aware of possible compartment syndrome.
- Blood loss may be concealed or not apparent with extremity injuries.
- Lacerations should be evaluated for repair as soon as possible after injury.

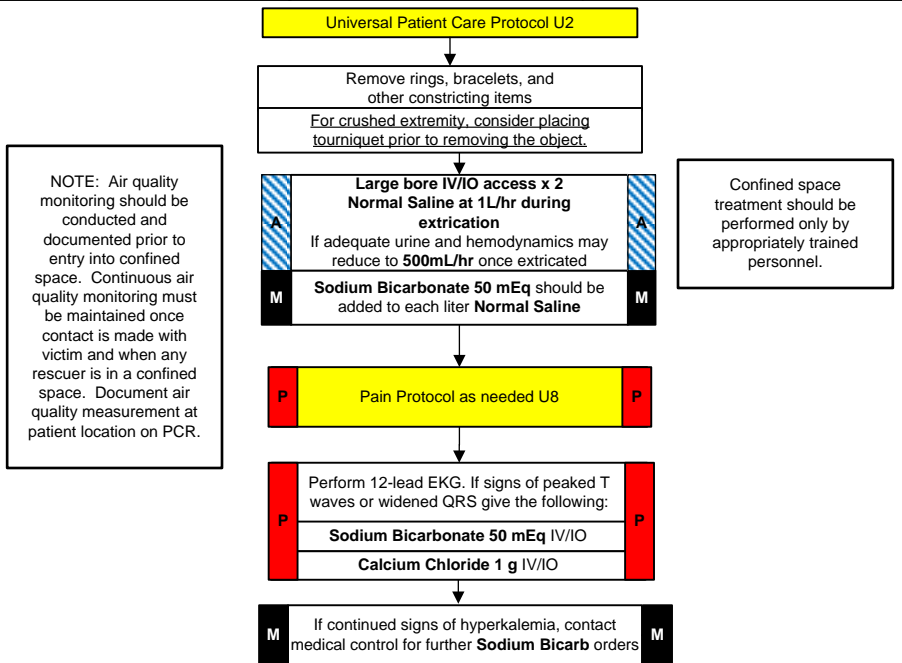
<p><b>History:</b></p> <ul style="list-style-type: none"> <li>• Time and injury/onset</li> <li>• Blunt/penetrating/chemical</li> <li>• Involved chemicals/MSDS</li> <li>• Wound Contamination</li> <li>• Medical Hx</li> <li>• Tetanus status</li> <li>• Normal visual acuity</li> <li>• Medications</li> </ul>	<p><b>Signs and Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Pain, swelling, blood</li> <li>• deformity, contusion</li> <li>• Visual deficit</li> <li>• Leaking aqueous/vitreous humor</li> <li>• Upwardly fixed eye</li> <li>• Shooting or streaking light</li> <li>• Visual contaminants</li> <li>• Rust ring</li> <li>• Lacrimation</li> </ul>	<p><b>Differential:</b></p> <ul style="list-style-type: none"> <li>• Abrasion/Laceration</li> <li>• Globe rupture</li> <li>• Retinal nerve damage</li> <li>• Chemical/thermal burn</li> <li>• Orbital Fx</li> <li>• Orbital compartment syndrome</li> <li>• Neurological event</li> <li>• Acute glaucoma</li> <li>• Retinal artery occlusion</li> </ul>
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**Pearls:**

- Normal visual acuity can be present even with severe injury.
- Remove contact lens when possible. If adherent to globe do not force. Irrigation may assist removal.
- Any chemical or thermal burns to the face/eyes should raise concern for respiratory insult.
- Orbital fracture raise concern for globe or nerve injury and need for repeat assessments.
- Always cover both eyes to prevent further insult.
- DO NOT remove impaled objects.
- Suspected globe rupture or compartment syndromes require emergent evaluation.

<b>History:</b> <ul style="list-style-type: none"> <li>• Prolonged immobility</li> <li>• Compressed body part(s)</li> <li>• Time/Duration of compression</li> <li>• Renal/Cardiac history</li> <li>• Additional trauma</li> <li>• Loss of consciousness</li> <li>• Air quality</li> </ul>	<b>Signs and Symptoms:</b> <ul style="list-style-type: none"> <li>• Compartment Syndrome</li> <li>• Pain on passive stretch</li> <li>• Paresthesia</li> <li>• Paralysis</li> <li>• Pallor</li> <li>• Pulselessness</li> <li>• Hypotension/Shock</li> <li>• Altered Mental Status</li> </ul>	<b>Differential:</b> <ul style="list-style-type: none"> <li>• Skin irritant exposure</li> <li>• Toxic inhalation</li> <li>• Dust concretions in airway</li> <li>• Hypo/Hyperthermia</li> <li>• Hyperkalemia</li> <li>• Dehydration</li> <li>• ECG abnormalities</li> <li>• Additional trauma</li> </ul>
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**Pearls:**

- **Hydration should begin prior to extrication whenever possible.** Large volume resuscitation prior to removal of the crush object and extrication is critical to preventing secondary renal failure and death.
- Crush injury is usually seen with compression of 4-6 hrs but may occur in as little as 20 min.
- If possible monitor patient for signs of compartment syndrome (pain, pallor, paresthesias, pulselessness)
- Crush injury victims can 3rd space >12L in the first 48 hrs..
- Elderly and pediatric patients should be monitored closely for volume overload but do NOT withhold fluids unless clinical signs/symptoms of volume overload.
- The larger the mass crushed (ie more limbs) the greater the likelihood of severe rhabdomyolysis and renal failure.
- Crush injury may cause profound electrolyte disturbances resulting in dysrhythmias. Monitor if possible.
- Do not overlook treatment of additional injuries, airway compromise, hypothermia/ hyperthermia.
- Nebulized saline and/or albuterol should be administered to victims with dust concretions in airway.
- Patients may develop ileus. Do not give anything by mouth.



# Clinical Procedures

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## Clinical Indications:

EMT or Above

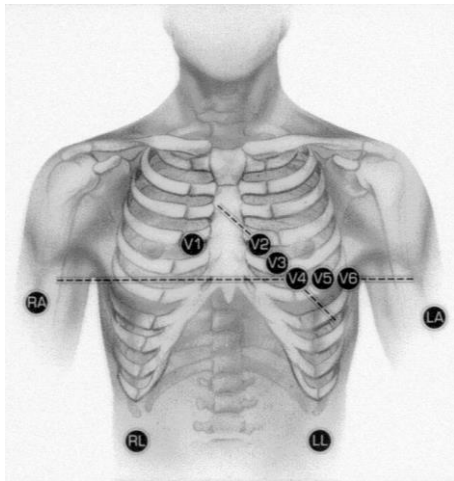
**Goal: First pt contact to EKG ≤ 10 min to provide early identification & activation for suspected STEMI's.**

## Any patient with the following:

- Suspected cardiac patient
  - Includes pain between navel and jaw
  - Pressure, discomfort, tightness or heartburn
  - "Heart racing", "palpitations," or "heart too slow"
  - CHF
  - Anginal equivalents / atypical signs/symptoms.
- Electrical injuries
- Syncope, weakness, or unexplained fatigue
- New onset stroke symptoms
- Difficulty breathing
- Recent cocaine use or suspected drug overdose
- ROSC

## Procedure:

1. Expose chest and prep (shave hair / dry skin) as necessary. Modesty of the patient should be respected.
2. Apply chest leads and extremity leads using the following landmarks (measure intercostal spaces, do not use the nipple line as a reference):
  - RA -Right arm
  - LA -Left arm
  - RL -Right leg
  - LL -Left leg
  - V1 -4<sup>th</sup> intercostal space at right sternal border
  - V2 -4<sup>th</sup> intercostal space at left sternal border
  - V3 -Directly between V2 and V4
  - V4 -5<sup>th</sup> intercostal space at midclavicular line
  - V5 -Level with V4 at left anterior axillary line
  - V6 -Level with V5 at left midaxillary line



**Note:** Locating V1 position (4<sup>th</sup> intercostal space) is critically important because it is the reference point for locating the placement of the remaining V leads. An alternate method to location the V1 position is:

- Place your finger at the notch in the top of the sternum.
  - Move your finger slowly downward about 1.5 inches until you feel a slight horizontal ridge or elevation. This is the "Angle of Louis" where the manubrium joins the body of the sternum.
  - Locate the 2<sup>nd</sup> intercostal space on the patient's right side, lateral to and just below the Angle of Louis.
  - Move your finger down two or more intercostal spaces (you are now at the 4<sup>th</sup> intercostal space), which is the V1 position.
3. Prepare monitor & connect patient cable with electrodes.
  4. Enter the required patient information (patient name or truck #, age, gender) in to the 12-lead ECG device.
  5. Instruct patient to remain still, preferably in the supine position. If not tolerated, place in semi-reclining position.
  6. Press the appropriate button to acquire the 12 Lead ECG.
  7. Relay findings to hospital. If a STEMI is identified, notify the ED immediately for STEMI / cath lab activation.
    - All EMT-acquired 12-leads (and positive or questionable ALS 12-leads) will be transmitted to the receiving facility. Transmissions will include contact information for the ambulance. All transmissions will be followed w/a phone call to the facility. If transmission is not available EMTs may request a STEMI alert if the monitor interpretation states "Acute Myocardial Infarction."
  8. For cardiac patients, keep all leads connected when practical to allow automatic ST-segment monitoring to proceed. The monitor will signal when a change occurs and the 12-lead should be repeated.
  9. Document the procedure, time, and results on/with the patient care report (PCR).

### Things to Remember

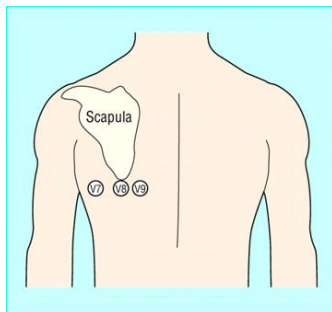
- Acquisition of the 12-lead should not significantly delay transport of patient.
- Always place leads V3-V6 under (not over) the breast of female patients.
- A "normal" ECG does not definitely rule out AMI nor should it be a justification for non-transport.
- Attempt to obtain 12-lead while the vehicle is not moving. Ask the patient to remain motionless (other than breathing) while obtaining the 12-lead.
- If signal noise is detected, the 12-lead acquisition will be interrupted, only resuming after the noise is removed. Attempt to resolve source of noise (movement, loose patch, disconnected cable) and reattempt acquisition.

### Suspecting a Posterior MI

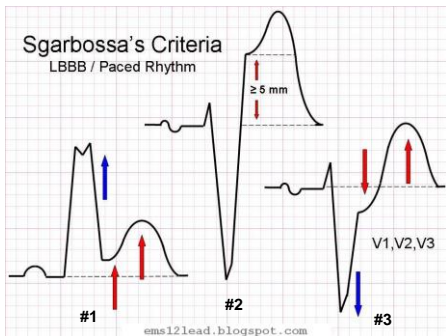
- Characterized by deep ST segment depression in V1-V3, tall R waves in V1-V3 and upright T waves in V1-V3.
- Maximal ST depression (>2mm) in V1-V3 may be 90% specific for posterior MI.
- When a posterior MI is suspected, a posterior 12-lead (adding leads V7-V9) may be obtained if it does not delay care or transport. These leads are placed at the same level of V4-V6, simply on the rear of the body.
  - V7 (V6) -Posterior axillary line
  - V8 (V5) -Midscapular
  - V9 (V4) -Paraspinal

When obtaining a posterior ECG, use the V4-V6 leads in the V7-V9 positions as noted. Be sure to document, both on paper copies and ESO that V4, V5, & V6 on a printout / display is actually V7, V8, V9.

I Lateral	aVR	V1 Septal	V4 Anterior
II Inferior	aVL Lateral	V2 Septal	V5 Lateral
III Inferior	aVF Inferior	V3 Anterior	V6 Lateral
Limb Leads		Chest Leads	



**NOTE: Only paramedics are allowed to interpret 12-lead findings.**



### Sgarbossa's Criteria for LBBB/Paced Rhythms

- Concordant (T wave's direction is with the last part of the QRS complex) ST elevation  $\geq 1$  mm in any lead  
– **Request ACS Alert**
- Discordant ST elevation  $\geq 5$  mm in any lead – Not specific enough for ACS Alert, consult Medical Control if patient presentation is suspicious of ACS.
- ST depression  $\geq 1$  mm in V1-V3 (only one lead required)  
– **Request ACS Alert**



**Clinical Indications:**

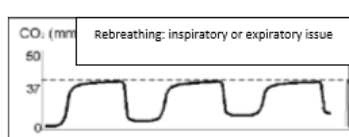
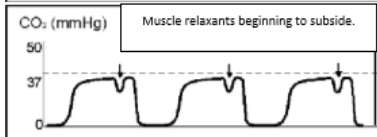
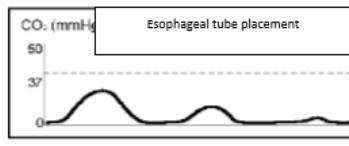
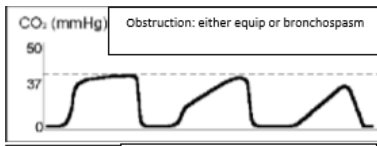
- All patients with a potential, or actual, change in metabolism, circulation, and/or respiratory function
- Hypoventilation states
- Shock states
- Shortness of breath/Bronchospastic disease
- Chest pain with respiratory distress
- Congestive Heart Failure
- All patients with advanced airways or receiving CPR
- Patients experiencing altered mental status
- Any patient receiving/having received sedating medications or magnesium

**Contraindications:** None**Notes/Precautions:**

- A patient with normal cardiac and pulmonary function will have an ETCO<sub>2</sub> level between 35-45 mmHg. All patients' ETCO<sub>2</sub> should be kept within this range, including the head injury patient (closer to 35 is acceptable).
- In all patients with a pulse an ETCO<sub>2</sub> reading > 20 is expected. In the post resuscitation patient no effort should be made to lower ETCO<sub>2</sub> by modification of the ventilatory rate.
- When no CO<sub>2</sub> is detected, 3 factors must be quickly evaluated for the cause:
  - Loss of airway function- Improper tube placement, apnea
  - Loss of circulatory function- Massive PE, cardiac arrest, exsanguination
  - Equipment malfunction- Tube dislodgement or obstruction
- Increase in EtCO<sub>2</sub> can be caused by: pain, fever, shivering, increased cardiac output, resp depression/insufficiency
- Decrease in EtCO<sub>2</sub> can be caused by: Sedation, hypothermia, cardiac arrest, embolism, bronchospasm, mucus plug, hyperventilation, misplacement or equipment leak, partial obstruction, sudden hypovolemia
- All advanced airway patients (oral or nasal endotracheal intubation, King LTS-D) will have capnography applied and documented in the Patient Care Record (PCR). Ways to document ETCO<sub>2</sub> findings are:
  - Document your values, including the time measured, in the patient narrative.
  - As an intervention in ESO.
  - On the printout from the monitor (scan & attach to ESO).

**Procedure:**

1. Turn on monitor and adjust contrast as needed.
2. Verify ETCO<sub>2</sub> display is on and functioning.
3. Open tubing connector door and connect ETCO<sub>2</sub> Filterline tubing by turning clockwise. Tubing should be connected to monitor before being connected to patient's airway.
4. Connect tubing to patient airway.
5. For patients meeting the indications for capnography the capnometer shall remain in place and be monitored throughout prehospital care and transport.
6. Continuous capnometry should be monitored as airway procedures are performed to aid in verification or correction of an airway problem.
7. Any loss of CO<sub>2</sub> detection or waveform should be immediately evaluated for loss of airway or circulatory compromise and should be documented.
8. In the pulseless patient an ETCO<sub>2</sub> waveform with an ETCO<sub>2</sub> value > 10 may be utilized to confirm the adequacy of an airway to include BVM and advanced devices when SpO<sub>2</sub> will not register.



## Clinical Indications:

- Pulse Oximetry
  - As an adjunct to patient assessment
  - Any patient who receives a narcotic, sedative, or paralytic medication
  - Before, during, and after advanced airway, CPAP or other airway intervention
  - Any medical patients; especially those with respiratory or cardiac complaints.
  - Multiple trauma or burn patients.
- CO Oximetry (If using CO oximetry, pulse oximetry should be used as well).
  - Patients with non-specific complaints such as flu-like symptoms, nausea, dizziness, or altered mental status.
  - Patients with smoke inhalation or burn injuries.
  - Triaging patients at known or suspected carbon monoxide exposures.
  - Monitoring fire fighters during rehabilitation at active fire scenes.

**Contraindications:** None

## Notes/Precautions:

Specific circumstances that may result in inaccurate pulse oximetry readings:

- States of decreased peripheral perfusion (hypotension, hypothermia)
- Carbon monoxide poisoning, methemoglobinemia, cyanide poisoning, anemia
- Excessive ambient light (sunlight, florescent lights) on the pulse oximeter probe. Cover the sensor in these environments.
- Poor perfusion states (hypovolemia, hypothermia, profound hypotension, or vasoconstriction) can cause fluctuations or inaccurate measurements. Use the perfusion index if using a Rad-57 to find the best site and monitor physiologic changes in the patient.

## Procedure:

- Apply probe to finger or other site as recommended by the device manufacturer.
- Allow device to register initial saturation level and record the time and result to be included on the patient care report. Initial readings should be on room air when possible and patient condition allows.
- Correlate patient pulse with oximeter pulse and waveform.
- Monitor critical patients continuously throughout pre-hospital care.
- Remember to treat the patient not the pulse oximeter reading. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress.

## Parameters:

### %SpCO

Normal	<5 (<10 for smokers)
Mild	<15-20
Moderate	21-40
Severe	41-59
Fatal	>60

## Pediatric Considerations:

- The proper size probe is needed to obtain accurate readings in small or pediatric patients. Pediatric patients may only benefit from placement on the foot or toes. O2 saturations are best obtained the right upper extremity in the newborn patient.

## Special Considerations:

- Best probe site in adults is usually the middle or ring fingertip of the non-dominant hand.
- Attempt to obtain and document pulse oximetry readings before and during oxygen therapy.
- The use of pulse oximetry as a vital sign is encouraged, as the oximeter may be helpful in detecting hypoxia not evidenced by signs or symptoms.
- When SpCO measurements don't appear to fit the physical findings or to ensure accuracy, take an average reading. Obtain a reading from the index, middle, and ring fingers of your patient. The average of those readings is the accurate SpCO.

**Clinical Indications:**

- Congestive Heart Failure/Pulmonary Edema
- Submersion / Drowning
- Chronic Obstructive Pulmonary Disease
- Acute Respiratory Distress
- Severe Dyspnea that may include SaO<sub>2</sub> < 94%
- Dyspnea where pt is using accessory muscles
- Asthma
- Pneumonia

**Contraindications:**

- Respiratory arrest
- Agonal respirations
- Unconsciousness or inability to breathe deep enough to trigger PEEP
- Shock associated with cardiac insufficiency (systolic BP < 90mmHg)
- Pneumothorax
- Facial trauma, burns
- Cannot maintain an open airway (~GCS < 10)
- Patient with a tracheostomy

**Notes/Precautions:***Possible complications include*

- Gastric distention
- Reduced cardiac output
- Hypoventilation
- Pulmonary barotrauma

*Use special care if patient:*

- Has active upper GI bleeding or history of recent gastric surgery.
- Complains of nausea or vomiting.
- Has excessive secretions.
- Has a facial deformity that interferes with the use of CPAP.

**Procedure:**

- Ensure all necessary equipment is available, assembled and connected to an adequate O<sub>2</sub> supply.
- Select initial appropriate PEEP for condition (5-10 cm H<sub>2</sub>O). Titrate to desired pt response.
  - Start at 5cm H<sub>2</sub>O for patients with reactive airway disease.
- Fully explain procedure to patient.
- Have patient hold mask to face and instruct him/her to breathe slowly and deeply. Use "verbal sedation" to help calm the patient.
- Once patient is comfortable with mask, securely attach headpiece and tighten to fit.
- The adjunctive delivery of an **albuterol** neb with the CPAP device is an approved procedure and treatment modality. Patient presentation and distress level should dictate the timing or use of this procedure. The addition of albuterol in this fashion should not create delays in the use of CPAP and, only providers who are trained and appropriately equipped should use this.
- Check for air leaks around the mask and equipment (adjust / secure as needed).
- Monitor & document the patient's respiratory response to the treatment.
- If respiratory status deteriorates, remove device and consider bag valve mask intubation and/or endotracheal intubation.

## Removal

- CPAP therapy needs to be continuous and should not be removed unless:
  - The patient cannot tolerate the mask.
  - Blood pressure falls < 90mmHg systolic.
  - Patient experiences continued or worsening respiratory failure.

## Special Notes

- Advise receiving hospital as soon as possible so they can be prepared for the patient.
- Do not remove CPAP until hospital therapy is ready to be placed on the patient.
- Watch patient for gastric distention.
- Continue with other needed treatments for your patient.
- Reassessment of the patient's status is critical and should be performed every 5-10 minutes.
- Be sure to have adequate oxygen supply for treatment.
- CPAP may be used on a patient with a DNR but try to obtain patient or family consent prior to placing.

**Clinical Indications:**

Patients with suspected tension pneumothorax as evidenced by:

- Hypotension (SBP<90), clinical signs of shock and at least one of the following:
  - Jugular vein distention
  - Absent or decreased breath sounds on the affected side
  - Hyper-resonance to percussion on the affected side
  - Increased resistance when ventilating a patient / increased respiratory difficulty
  - Tracheal deviation away from the side of injury (a late sign)
  - Narrowing pulse pressure
  - Falling systolic blood pressure
  - Central cyanosis
- Patient in traumatic arrest with chest or abdominal trauma in whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above

**Precautions:**

- Crepitus and/or subcutaneous air may be present with a simple or tension pneumothorax.
- Always insert needle over (cephalad to) rib to avoid the neurovascular bundle.

**Procedure:**

- Administer high flow oxygen.
- Prepare equipment and don appropriate PPE.
  - Adults – use designated chest needle of at least 3 inches.
  - Peds – use a 14 ga. Needle at least 1 ¾ inches.
- Identify and prep the site:
  - Locate the second intercostal space in the midclavicular line (preferred)
  - As an alternate site, lateral placement at the fourth intercostal space in the mid-axillary line may be used.
- Prepare the site with alcohol.
- Insert the appropriate catheter perpendicular (90°) to the chest wall over the top of the inferior rib.
- Advance the needle-catheter assembly through the parietal pleura until a “pop” is felt and air or blood exits the catheter. Advance only the catheter until the hub is in contact with the chest wall.
- Remove the needle leaving the plastic catheter in place.
- Secure the catheter hub to the chest wall.
- Consider placing one-way valve or creating a flutter valve from the finger of an exam glove. This should not delay the pleural decompression procedure. If using a Heimlich valve, pay attention to the proper flow direction.
- Notify the hospital the procedure has been performed.

**Precautions:**

- Rush of air or patient improvement indicates correct placement.
- In the majority of circumstances, bilateral decompression will be required.
- Once needle is placed, prehospital personnel should not remove it.
- Document procedure on Advanced Procedures Data Collection Form.

## Clinical Indications:

- Any patient with an altered mental status
- Patients with metabolic or endocrine disorders, and presenting with non-specific complaints
- Bradycardia or hypothermia in infants
- Any patient with the following symptoms may be considered for blood sugar testing: sweating, trembling, blurred vision, rapid heartbeat, tingling, or numbness around the mouth or fingertips.

## Procedure:

- Gather and prepare equipment.
  - Glucometer
  - Test strips
  - Lancets
  - Alcohol wipe
  - 2x2s
  - Band-aid
- Blood samples for performing glucose analysis should be obtained through a finger-stick. Venous blood samples may produce artificially high blood glucose values and should be avoided.
- Turn the device on.
- Confirm that the code number on the test strips matches the code number displayed on the glucometer at startup if needed per manufacturer.
- Place the test strip into the glucometer.
- Using a lancet, prick the finger to obtain a blood sample using aseptic technique.
- Hold the glucometer with the test strip in place to the blood sample. Allow the blood sample to be drawn up into the test strip.
- Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
- Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
- Perform Quality Assurance on glucometers as recommended by the manufacturer and document. If any clinically suspicious readings are noted perform quality assurance test immediately after the call and notify a supervisor as appropriate.

## Special Notes

- Precision Xtra glucometer has settings as follows: LO = less than 20 mg/dl and HI = more than 500 mg/dl
- Nova Express has settings as follows: LO = less than 10 mg/dl and HI = more than 600 mg/dl

**Clinical Indications:**

- Patients in cardiac arrest (pulseless, non-breathing)

**Contraindications:**

- In the presence of flammable anesthetics, agents or environments which an electrical arc could ignite an explosion.

**Notes/Precautions:**

- Age < 8 years, use Pediatric Pads, if available, or if device has “energy attenuating” device, be sure to utilize the device. Pay attention to weight limits on package.
- If AED Pads touch due to patient size, use an Anterior-Posterior (also known as the alternate placement). To use this placement, place both electrodes over the heart, one on the front of the body, one on the back.
- Physicians may find the AED information helpful in determining future treatment. A print out or download should be provided to the hospital after resuscitation.
- This procedure should also be followed when using manual defibrillation. The difference is the paramedic will select the appropriate energy level instead of “analyze” in step 6 below.

**Procedure:**

1. **If multiple rescuers available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**
2. Keep CPR interruptions as brief as possible.
3. Expose the patient’s chest & remove any medication patches. Wipe off any residue.
4. Turn on the device and follow prompts. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions.
  - Usual placement is (white) electrode to the patient’s right upper chest / sternum, below the clavicle. The (red) electrode should be midaxillary area below the left breast.
  - Some manufacturers suggest a Front/Back placement. Both electrodes should be placed over the heart, one on the front of the body, one on the back.
5. Attach monitor cables to patches.
6. **If using a manual device (LifePak12, LifePakP15) as an AED, press the “Analyze” button and follow prompts. If using a Philips MRx, turn knob to AED and follow prompts. Ensure no motion.**
  - If shock advised, **Assertively state “CLEAR” and visualize that no one, including yourself, is in contact with the patient then press the shock button. Resume CPR immediately.**
  - **If NO shock advised, resume CPR immediately.**
7. Allow the AED to analyze when prompted (approximately every 2 minutes) & follow prompts/directions.
8. Repeat steps 7 through 9.
9. **Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation**

**If pulse returns:**

See post resuscitation protocol **M30**.

## Clinical Indications:

- Patients requiring rapid medication administration in accordance with protocol and other route(s) of administration are not immediately available
- Medications currently System approved for this route (see individual protocols for dosing):
  - Midazolam (Versed) **P**
  - Fentanyl (Sublimaze) for Pain/Anxiety management **P**
  - Naloxone (Narcan) - IN is considered a safer route **EMT**
  - Glucagon for hypoglycemic reactions **A**
  - Ondansetron (Zofran) **P**
  - Lorazepam (Ativan) **P**

## Procedure:

- Airborne PPE (and eye protection) should be worn when administering medication via this route.
- Dose appropriate medications should be drawn up into syringe.
- Attach MAD 300 device to syringe.
- **Rapidly** administer medication to aerosolize it into patient nostril (limit of 1.0 mL per nostril).
- Due to fluid contamination dispose of in an approved sharps container.

## Precautions:

- Bloody or runny nose, nasal congestion or destruction of nasal mucosa may prevent proper absorption of the drug.





**Clinical Indications:**

- Adult and pediatric cardiac arrest following placement of advanced airway
- When requested by On-Line Medical Control

**Contraindications:**

- Actual or suspected laceration or perforation of the esophagus
- Suspected fractures of the cribriform plate as evidenced by severe maxillofacial trauma (Nasal gastric tube placement only)
- Ingestion of a caustic substance
- Anticoagulant use (e.g., coumadin, warfarin) or disorders of coagulopathy (hemophilia) is a relative contraindication

**Procedure:**

1. Select appropriate sized tube according to patient size and measure the correct length for insertion.
  - To measure length: While holding the distal end of the tube, measure the distance from the patient's earlobe to the bridge of his/her nose, and from there to a point just below the xiphoid process
  - Mark this length with a piece of tape to serve as a future guide point
2. Have patient sit upright and lean slightly forward with his/her neck slightly flexed unless otherwise contraindicated.
3. In the unconscious or arrested patient with an advanced airway in place the orogastric route of insertion may be preferred. The gastric tube may also be inserted through the gastric lumen of the King LTS-D airway.
4. Lubricate distal 3 to 6 inches of the tube and select the most widely patent nostril.
5. Support the back of the patient's head and gently advance tube straight back along the floor of the nasal cavity (in an anterior-to-posterior direction, not cephalad). If resistance is felt, rotate tube slightly to help advance it into position.
6. As tube reaches the posterior nasopharynx the patient is likely to gag. At this point, if the patient is able to do so, and it is not contraindicated, have the patient swallow a small amount of water.
7. Continue to insert the tube past the glottic opening into the esophagus. Continue to insert the tube into the nose until the pre-measured mark reaches the front edge of the nostril.
8. After reaching the predetermined mark confirm that the tube has not curled up into the oropharynx or pharynx. While listening over the epigastrium, inject 20-30 mL of air into the tube and listen for "gurgling" to indicate proper placement. Aspirate and observe for gastric contents (may not always be present).
9. If no sounds are heard over the epigastrium, and you notice fogging or misting in the tube, or patient cannot cough or speak, immediately withdraw the tube and oxygenate the patient.
10. If tube placement has been confirmed, securely tape the proximal end where it enters the nostril to the bridge of the nose.
11. After tube is firmly secured, connect the proximal end to suction device and suction with low suction as needed.

**Special Notes:**

1. Preloading the gastric tube into a King Airway may facilitate easier placement.
2. For gastric tube placement in an i-gel, the proximal end should be lubricated prior to introduction of the gastric tube.

**Clinical Indications:**

- Unresponsive patient with no apparent gag reflex that is unable to protect his/his own airway.

**Contraindications:**

- Patients who are conscious or who have an intact gag reflex
- Patients under/over height for tube size used
- Patients with known esophageal disease (varicies, alcoholism, cirrhosis etc.) or ingestion of caustic substances
- Deforming facial trauma that prevents proper seating of the airway

**Warnings/Precautions:**

- The KING LTS-D may not prevent aspiration of stomach contents or completely block the effects of regurgitation and aspiration.
- High airway pressures may divert gas either to the stomach or to the atmosphere.
- Intubation of the trachea cannot be ruled out as a potential complication of insertion. Careful placement checks must be used.
- May be used in trauma, but take care to prevent neck movement.
- In the arrested patient needing defibrillation, initial defibrillation should not be delayed for insertion.
- Pulse oximetry may be unreliable in states of low perfusion such as cardiac arrest.

**Procedure:**

1. Use appropriate PPE (including facial precautions).
2. Prepare (including suctioning the mouth and oropharynx if needed), position and oxygenate the patient.
3. Begin positive pressure ventilation with 100% oxygen & oral airway. Breaths should be given approximately 10-12 times per minute but attempt to maximize oxygen saturation.
4. Choose the appropriate King LTS-D airway based on the patients height and the package insert.
  - #2 for patients 34-45 in or 12-25kg
  - #3 for patients 4-5 ft
  - #4 for patients 5-6 ft
  - #5 for patients > 6 ft
5. Test cuff inflation system by injecting the maximum volume of air into the cuffs. Remove all air from cuffs prior to insertion.
6. Apply a water-based lubricant to the beveled distal tip and posterior aspect of the tube, taking care to avoid introduction of lubricant in or near the ventilatory openings.
7. Position the patient in the "sniffing position" unless otherwise contraindicated (it can be used in a neutral position for trauma patients). Hold the KING LTS-D at the connector with dominant hand. With non-dominant hand, grasp the lower jaw and tongue between the thumb and fingers.
8. With the KING LTS-D rotated laterally 90° such that the blue orientation line is touching the corner of the mouth, introduce tip into corner of mouth and advance behind base of tongue rotating the tube back to midline (blue orientation line faces chin) as the tube passes under the tongue.
9. Without exerting excessive force, advance the King until the base of the connector aligns with the teeth or gums. Never force the tube into position.
10. Inflate the cuffs with the recommended volume necessary to seal the airway.
  - Size 2 25-35mL
  - Size 3 45-60mL
  - Size 4 60-80mL
  - Size 5 70-90mL
11. Attach the BVM to the 15 mm connector of the KING LTS-D. While gently ventilating the patient to assess ventilation, simultaneously withdraw the airway until ventilation is easy and free flowing (large tidal volume with minimal airway pressure).
12. Depth markings are provided at the proximal end of the KING LTS-D which refer to the distance from the distal ventilatory openings. When properly placed with the distal tip and cuff in the upper esophagus and the ventilatory openings aligned with the opening to the larynx, the depth markings give an indication of the distance, in cm, from the vocal cords to the upper teeth.

13. Confirm proper position by auscultation, chest movement **and** verification of CO2 by capnography/ capnometry.
14. Readjust cuff inflation to maintain a seal of the airway at the peak ventilatory pressure employed.
15. Do not let go of the King Airway until secured.
16. Secure King LTS-D to patient using tape or an approved commercial device. **DO NOT COVER THE PROXIMAL OPENING OF THE GASTRIC ACCESS LUMEN.** The gastric access lumen allows the insertion of up to a 18 Fr diameter gastric tube into the esophagus and stomach.
17. Immediately following successful placement of the King Airway consider applying an appropriately sized cervical collar to maintain c-spine stabilization. In the event a C-collar will not fit, manual inline stabilization should be utilized and if transported; blankets, towels and tape should be used appropriately to restrict cervical spinal motion.
18. If an adult or pediatric patient is to be transported, they must be appropriately secured to a backboard.

## For EMT-P level training or above:

- For emesis or stomach decompression, a gastric tube may be inserted through the gastric access lumen. Lubricate the tube prior to insertion. Measure the tube as you would for OG placement.
- Preloading the gastric tube into the gastric access lumen may facilitate placement.
- The ventilation outlets between the cuffs allow for passage of a tube exchange to facilitate intubation in the ED or in emergent cases where the King LTS-D® does not provide adequate airway protection.

## Removal Procedure:

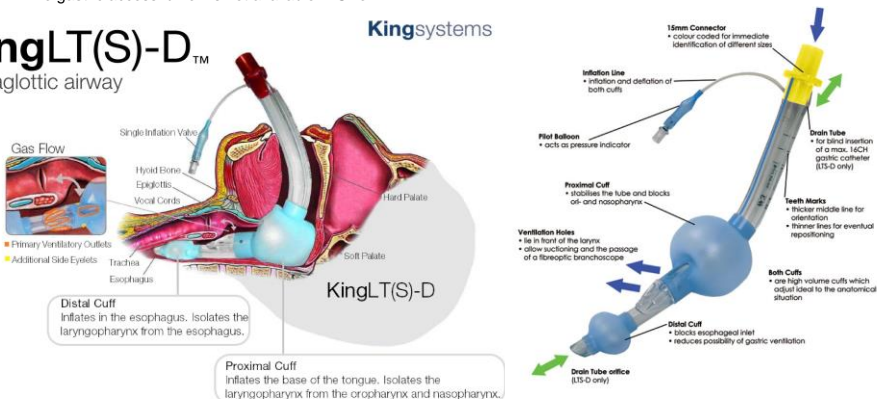
1. The King LTS-D® should not be removed unless:
  - Ventilation is inadequate.
  - BLS only: The patient no longer tolerates the airway (begins to gag).
2. Have suction equipment ready.
3. Log roll the patient to the side.
4. Deflate the cuffs completely.
5. Gently remove the device while suctioning the airway.

## Special Notes:

- If the tube appears to bounce back upon full insertion and release, the device has most likely entered the piriform fossa. Make sure to keep the distal tip midline and reinsert.
- Always follow the above procedure to obtain correct placement. Initially placing the device too shallow and trying to advance with the cuffs inflated can cause misplacement and/or trauma to the airway.
- The King LTS-D® may be used with ETCO2, a bag-valve-mask, and an automatic transport ventilator.
- The King LTS-D® must be left in place when a patient is pronounced in the field.
- The King LTS-D® is a single use device and should be discarded after use.
- The gastric access lumen is not available in Size 2.

## KingLT(S)-D™ supraglottic airway

King  
systems



The patient's airway and ventilations should be supported with either positive pressure ventilation or passive oxygenation as appropriate for the patient until this device is placed. Suctioning and positioning are important steps in supporting the airway.

When available

EMT or Above

## Clinical Indications:

- Unresponsive patient with no apparent gag reflex that is unable to protect his/his own airway.

## Contraindications:

- Patients who are conscious or who have an intact gag reflex
- Inappropriate device size for patient
- Clenched jaw, limited mouth opening, pharyngo-perilaryngeal abscess, trauma or mass

## Warnings/Precautions:

- Patients with a Mallampati score of III and above.
- Do not use excessive force to insert the device or gastric tube.
- Patients with any condition which may increase the risk of a full stomach e.g. hiatus hernia, sepsis, morbid obesity, pregnancy or a history of upper gastrointestinal surgery, etc.
- Patient who have fragile and vulnerable dental work. Dentures should be removed prior to placement of device.
- May be used in trauma, but take care to prevent neck movement.
- In the arrested patient needing defibrillation, initial defibrillation should not be delayed for insertion.
- Pulse oximetry may be unreliable in states of low perfusion such as cardiac arrest.

## Procedure:

1. Select the appropriate size by assessing the patient's anatomy. While size selection on a weight basis should be applicable to the majority of patients, individual anatomical variations mean the weight guidance provided should always be considered in conjunction with a clinical assessment of the patient's anatomy. i.e. long necks or wide thyroid/cricoid cartilage may require larger size than normal weight basis. Patients with a broad or stocky neck or smaller thyroid/cricoid cartilages may require a smaller size.

i-gel size	Patient size	Patient weight guidance (kg)
1	Neonate	2-5
1.5	Infant	5-12
2	Small paediatric	10-25
2.5	Large paediatric	25-35
3	Small adult	30-60
4	Medium adult	50-90
5	Large adult+	90+

2. Inspect the airway to ensure it is patent, no foreign bodies or lubricant obstructing the distal opening and that surfaces are smooth and intact.
3. Use appropriate PPE (including facial precautions).

**15mm connector**  
Reliable connection to any standard catheter mount or connection

**Proximal end of gastric channel**

**Clearly displayed product information**  
For quick easy reference. Includes confirmation of size and weight guidance

**Position guide**  
(adult sizes only)



**Gastric channel**

The i-gel incorporates a gastric channel (except size 1). It provides an early warning of regurgitation, allows for the passing of a nasogastric tube to empty the stomach contents and facilitates venting



**Integral bite block**

Reduces the possibility of airway channel occlusion

**Buccal cavity stabiliser**

Aids insertion and eliminates the potential for rotation

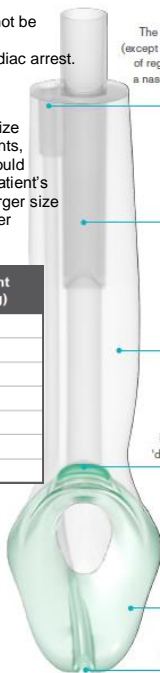
**Epiglottic rest**

Reduces the possibility of epiglottic 'down folding' and airway obstruction

**The non-inflatable cuff**

Made from a unique soft gel-like material allowing ease of insertion and reduced trauma

**Distal end of gastric channel**



## 4

Open the packaging and remove the airway. Place lubricant on the inside of the packaging. Lubricate the back, sides and front of the i-gel with a thin layer of water based lubricant. Ensure any excess is removed prior to insertion.



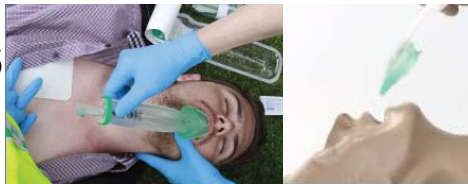
## 5

Grasping the i-gel firmly along the bite block, place the patient in the sniffing position, unless contraindicated, with the head extended and the neck flexed.

Position the device so that the i-gel cuff outlet is facing the patient. Introduce the leading soft tip into the mouth of the patient in the direction of the hard palate.



## 6



## 7

Slide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt. Sometimes a "give-way" is felt before the end point resistance is met. This is due to the passage of the i-gel bowl through the faucial pillars. It is important to continue to insert the device until a definitive resistance is felt.

The tip of the airway should be located into the upper esophageal opening (a), with the cuff located against the laryngeal framework(b). The incisors should be resting on the bite block (c). Once correct insertion is achieved and the teeth are located on the integral bite block, do not repeatedly push down or apply excessive force during insertion.



## 8



## 9

Secure the device by sliding the strap underneath the patient's neck and attaching to the hook ring. Take care to ensure the strap is not too tight. Alternatively the device can be secured by taping maxilla to maxilla.

Now that the i-gel has been correctly prepared, inserted, and secured, positive pressure ventilation can begin/resume. A gastric tube should be placed (suction catheter for EMTs).

**\*** For physician information, or for pre-hospital use only when an i-gel is not able to achieve adequate ventilation

The i-gel can be used as a conduit for intubation under fiberoptic guidance in a known or unexpectedly difficult intubation.

A size 5 i-gel can fit up to a 8 ETT, size 4 fits 7, 3 fits 6, 2 fits 5, 1.5 fits 4 and 1 fits 3.

A bougie can also be inserted to help facilitate ETI.



## Clinical Indications:

- Patients with a decreased level of consciousness (GCS < 8)
- Cardiac or respiratory arrest
- Profound respiratory depression, especially in:
  - Pulmonary edema, chronic obstructive pulmonary disease, or asthma
  - Cerebral insult or injury (use C-spine precautions)
- Patient suspected having suffered inhalation injuries or impending airway compromise

## Contraindications:

- None in the presence of the need for definitive airway management

## Precautions

- Intubation should be done with in-line spinal stabilization in trauma victims.
- Take appropriate universal precautions, including facial protection.

## Procedure:

- Prepare, position and preoxygenate the patient using appropriate BLS maneuvers and 100% oxygen.
- Select proper ET tube size. Prepare & test all equipment (including laryngoscope, ET tube cuff, suction).
- Using laryngoscope visualize vocal cords. BURP (backward, upward, right pressure) maneuver may be used as needed.
- Clear airway of foreign bodies / secretions.
- Limit each intubation attempt to less than 30 seconds. Utilize BVM between attempts.
- If unable to visualize the cords change patient position (if no spinal trauma suspected), or blade size/type. Also consider using a tracheal tube inducer and/or two-handed technique (left hand holds laryngoscope while right hand manipulates trachea until cords visible. Partner then holds trachea while tube is passed.) If able to visualize the vocal cords but unable to advance tube consider using smaller tube or using additional lubricant.
- Visualize tube passing through vocal cords. Insert tube until the proximal end of the cuff lies ½-1" beyond the cords. Remove stylet / flexible introducer and inflate ETT cuff with 5-10 mL of air.
- Auscultate for absence of sounds over epigastrium and presence of bilateral breath sounds. If unilateral or unequal breath sounds adjust tube position and/or consider causes for this finding. If unsure of placement at any time remove the ETT and resume ventilations with BVM.
- Apply ETCO<sub>2</sub> monitor. After 3 ventilations ETCO<sub>2</sub> should be > 10 or comparable to pre-intubation values. If < 10 check for proper ventilation waveform, adequate circulation, equipment failure and ventilatory rate. If no cause can be found remove the ETT and resume BVM ventilation.
- Record initial, ongoing and final ETCO<sub>2</sub> values in the PCR.
- Secure the ETT using commercial device whenever possible. Tape may be used if no commercial device is available.
- Document ETT size, depth of insertion, time of successful intubation and number of attempts. Document confirmation of the ETT by presence of breath sounds, absence of sounds over the epigastrium, end tidal CO<sub>2</sub> and/or capnography and any/all additional methods of confirmation. Reconfirm correct placement after each patient movement.
- Consider gastric distention and place an NG/OG tube after airway is secured with ETT.
- Complete airway verification form on arrival at destination.
- Consider immobilization (c-collar and/or spine board) for head stabilization.

## Additional Directives

- A maximum of two attempts per paramedic (4/patient maximum) is allowed.
  - Patients should be ventilated for two minutes between attempts.
  - If intubation is not successful, other means of airway management should be utilized (i.e., King LTS-D® or oral/nasal airway)
- Frequently reassess ET tube placement. Use direct visualization if necessary. Monitor ETCO<sub>2</sub> continuously.

## Removal Procedure

- The ET tube should not be removed unless placement cannot be determined or position is felt to be nontracheal.
- Have suction equipment ready.
- Log roll the patient to the side.
- Deflate the distal cuff. The pilot balloon should completely collapse.
- Remove ET during inspiration (if patient is spontaneously breathing) while suctioning the airway.

## Pearls

- The ETT must be left in place when a patient is pronounced dead in the field.

**Clinical Indications:**

- Any patient who meets clinical indication for orotracheal intubation
- Initial attempt unsuccessful
- Predicted difficult intubation
- Digital intubation

**Contraindications:** None**Notes/Precautions:**

- Soft tissue damage or bronchial rupture may occur:
  - During blind intubation
  - Positioning past the carina
  - If undue pressure is applied
  - If ET tube is passed over introducer without the use of a laryngoscope
- This is a single-use device. Do not attempt to clean or sterilize
- For optimal use, store flat in the same shape as packaged. Do not fold or roll up to save space

**Procedure:**

- Preload a lubricated (#6.0 or larger) ETT over the flexible introducer.
- Prepare and perform an optimal direct laryngoscopy in accordance with the orotracheal intubation procedure.
- Begin insertion of introducer.
  - Tactile confirmation of tracheal clicking will be felt as the distal tip of the introducer bumps against the tracheal rings
  - If tracheal clicking cannot be felt, continue to gently advance the introducer until "hold up" is felt
  - Tracheal "clicking" and "hold up" are positive signs that the introducer has entered the trachea
  - Lack of tracheal clicking or hold-up is indicative of esophageal placement.
- The correct depth of placement is indicated when the thick black line on the introducer is at the corner of the patient's mouth.
- Continue direct laryngoscopy.
- As the tip of the endotracheal tube passes beyond the teeth, rotate the tube 90 degrees counter clockwise (1/4 turn to the left) so tube bevel does not catch on the arytenoid cartilage.
- Advance endotracheal tube to the proper depth.
- Holding endotracheal tube securely, remove introducer.
- Verify correct placement of ET tube in accordance with the orotracheal intubation procedure.



## Clinical Indications:

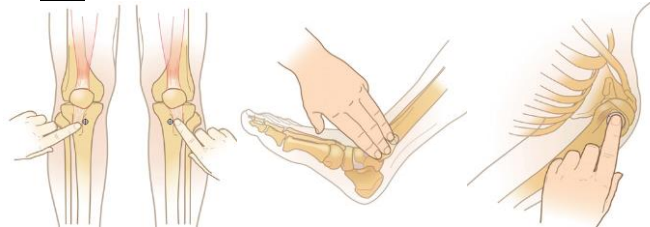
- Anytime vascular access is difficult and emergency medication or fluid administration is indicated.

## Contraindications:

- Do not perform on known or suspected fractured bones.
- History of Osteogenesis Imperfecta (brittle bone disease)
- Current or recent infection at proposed Intraosseous site
- Previous Intraosseous insertion within 48 hours
- Previous, significant orthopedic procedure at the site (or prosthetic limb or joint)
- Excessive tissue and/or absence of adequate anatomical landmarks.

## Procedure:

- Prepare EZ-IO assuring that complete needle set with trochar and needle is present.
  - Examine needle set to insure that seal is intact and needle is sterile, unused
  - Leave the protective cap on the needle until ready to perform procedure.
  - Only handle the needle set by the plastic hub.
- Landmark for insertion as follows:
  - Proximal Humerus: Place the patient palm on the umbilicus with the elbow on the ground or stretcher. Use your thumb to identify the humeral shaft. Slide thumb towards humeral head with firm pressure. Locate the tubercle by the prominent bulge. Use the opposite hand to pinch anterior and posterior humerus to assure midline position on the humerus
  - Proximal Tibia: Identify anteromedial aspect of the proximal tibia palpated just below the inferior border of the patella. Insertion site is 1-2 cm (2 finger breadths) below this on the flat surface of the tibia
  - Distal Tibia: (reserved for > 12 years of age) Identify the anteromedial aspect of the distal tibia (2 cm proximal to the medial malleolus)
  - Distal Femur (Pediatric only) – 3 finger widths above and exactly between the distal condyles of the femur.



- Prep the selected insertion site with alcohol swab.
- Remove and discard needle set safety cap from the IO needle (after it is installed on the power driver)
- Hold the Intraosseous needle at a 90 degree angle & **gently** insert needle set until the needle tip touches the bone.
  - Ensure at least one black line is visible above the skin.
- Penetrate bone cortex by squeezing the driver's trigger and applying **gentle, steady downward pressure**. Do NOT use excessive force. Allow needle set rotation and gentle downward pressure to provide the penetrating action.
- Release the driver trigger and stop insertion process when:
  - A sudden "give" or "pop" is felt upon entry into the medullary space.
  - For **adults only**, you may insert the needle to the hub.
- Remove the stylette and place in approved sharps container.
- Attach primed extension set and flush with 10mL normal saline.

- Prior to flush, may attempt to aspirate blood/marrow to confirm placement. No blood/marrow return does not necessarily mean poor placement.
  - Initial flush may feel like pushing D50. If you are unable to flush, you will be unable to run fluid.
10. If the patient experiences pain with infusion or medication administration lidocaine may be instilled in the IO catheter line. Discontinue fluid/medication administration prior to administering lidocaine and wait 15 seconds prior to restarting. Lidocaine dosing as follows may be repeated once if pain persists:
    - Adult: 40-60 mg (2-3 mL of 2% solution)
    - Pediatric: 0.5mg/kg (0.025mL/Kg of 2% solution) max dose 60 mg.
  11. Attach IV tubing and adjust flow rate as desired. A pressure bag may be used to enhance flow where appropriate.
  12. Stabilize and secure the needle.
  13. Administer fluids and medication as appropriate just as you would for IV. When administering medications via the IO route delivery should be followed with a 10mL flush of NS.
  14. Document the procedure, time and result on the patient care report and apply wrist band. The device may only be left in for 24 hours.
  15. Frequently monitor insertion site for extravasation.

**Special Notes:**

- Flow rates of up to 9L/hr can be achieved with pressure infusion. If drip rate is slow, flush with 10mL normal saline. Always consider using pressure infusion with IOs. Flow rates may change depending on patient's circulatory status. Be sure to monitor flow rate frequently and adjust pressure accordingly.
- All medications that are given via the IV route may be given IO.
- A manual IO needle may also be used for pediatrics; however the technique is slightly different. Use a firm pushing and boring motion (screwing) to penetrate the cortical surface (with penetration of the cortex the needle suddenly "gives way"). Following insertion, the device should feel "firmly" in place.

EMT or Above

For sites that  
have this device

## Clinical Indications:

- Open or closed mid-shaft femur fracture

## Contraindications:

- Injuries immediately proximal, or involving the knee joint
- Injury to the pelvis
- Partial amputation
- Lower leg or ankle injuries
- If use would delay transport of a patient with a life-threatening condition

## Notes/Precautions:

- Isolated proximal femur fractures in the elderly are usually best managed with anatomical splinting utilizing a scoop stretcher. Traction splints are not appropriate for proximal femur fractures

## Procedure:

1. Patient should be supine.
2. Check distal circulation, sensation, and motion.
3. Apply the ankle hitch tightly, slightly above the ankle bone.
4. Tighten stirrup by pulling the GREEN tabbed strap until the hitch fits snugly under the heel.
5. Apply upper thigh system by sliding male buckle under the leg at the patella, and using a "see-saw" motion, slide the strap upward until positioned in the groin.
6. Engage the buckle and cinch the strap until the traction pole receptacle is positioned at the belt-line or pelvic crest. Assure that genitalia are clear of strap.
7. Snap out traction pole making sure that each joint of the pole is securely seated.
8. Place traction pole alongside the leg so that one section (8") extends beyond the bottom of the foot.
9. Adjust pole length as required (i.e., pediatric vs. adult). Insert pole end, or ends, into the traction pole receptacle.
10. Secure elastic strap around knee.
11. Place YELLOW tab over pointed (dart) end of traction pole and apply traction by pulling RED tab.
12. Patient comfort will be the primary objective. Traction should be applied smoothly by grasping the strap on each side of the buckle and simultaneously feeding and pulling with equal pressure.
13. Finish packaging by applying upper (thigh) and lower (ankle) elastic straps.
14. Reassess distal circulation, sensation, and motion.
15. Secure to long spine board, scoop, etc.



EMT or Above

For sites that  
have this device

## Clinical Indications:

- Open or closed mid-shaft femur fracture

## Contraindications:

- Injuries immediately proximal, or involving the knee joint
- Injury to the pelvis
- Partial amputation
- Lower leg or ankle injuries
- If use would delay transport of a patient with a life-threatening condition

## Notes/Precautions:

- Isolated proximal femur fractures in the elderly are usually best managed with anatomical splinting utilizing a scoop stretcher. Traction splints are not appropriate for proximal femur fractures

## Procedure:

1. Expose the injured area.
2. Apply manual traction of the affected leg.
3. Check the patient's distal pulse, motor function and sensory function.
4. Place the splint next to the uninjured leg. Adjust it to the proper length, from the top of the patient's pelvis to a few inches past the ankle.
5. Attach the ankle hitch about the foot and ankle.
6. Manually apply gentle in-line traction to the ankle hitch.
7. Slide the splint into position under the injured leg.
8. Place the ischial pad against the iliac crest.
9. Fasten the ischial strap.
10. Connect the loop of the ankle hitch to the end of the splint.
11. Tighten the ratchet and release the manual traction. Continue to pull until the patient has relief of pain and muscle spasms.
12. Secure the splints with straps.
13. Reevaluate the patient's distal pulse, motor function, and sensory function.



EMT or Above

For sites that  
have this device

## Clinical Indications:

- Open or closed mid-shaft femur fracture

## Contraindications:

- Injuries immediately proximal, or involving the knee joint
- Injury to the pelvis
- Partial amputation
- Lower leg or ankle injuries
- If use would delay transport of a patient with a life-threatening condition

## Notes/Precautions:

- Isolated proximal femur fractures in the elderly are usually best managed with anatomical splinting utilizing a scoop stretcher. Traction splints are not appropriate for proximal femur fractures

## Procedure:

1. Expose the injured area.
2. Apply manual traction to the affected leg.
3. Check the patient's distal pulse, motor function, and sensory function.
4. Position the Sager traction splint between the patient's legs.
5. Adjust the splint to a distance slightly past the patient's ankle.
6. Apply the abductor bridle (tight strap) around the upper thigh of the fractured limb.
7. Push the ischial perineal cushion gently down while pulling the thigh strap snug.
8. Apply the Malleolar Harness (ankle harness) and attach it to the traction handle.
9. Face one hand on the padded shaft and the other hand on the traction handle while gently extending splint.
10. Pull the traction handle and release the manual traction. Continue to pull until one of the following condition is met.
  - Maximum of 7kg (15lb) for one femur fracture.
  - Maximum of 14kg for bilateral femur fractures.
  - Patient has relief of pain and muscle spasms.
11. Secure the splint with large elastic leg cravats.
12. Reevaluate the patient's distal pulse, motor function, and sensory function.



EMT or Above
FMA, HAS, TRFAA Sites Only

**Clinical Indications:**

- Agitation
- Actual or potential flight risk (to include being at risk of attempting to remove seat belts)
- Actual or potentially violent
- Has a history of dementia or Alzheimer's and may be at increased risk of any of the above

**Contraindications:**

- None

**Procedure:**

- The safety belt should be applied as soon as possible.
  - When applying the belt in a field setting, attempt to have law enforcement present to ensure sufficient assistance if the patient becomes agitated or violent.
  - When applying the belt in a facility setting, attempt to have hospital staff present to ensure sufficient assistance if the patient becomes agitated or violent.
- Secure the female end of the safety belt to the cot, just above where the head of the cot meets and pivots against the frame.
- Wrap the strap around the patient's waist and around the back of the stretcher.
- Buckle the strap and tighten enough to remove slack between the patient's body and the strap.
- Once the strap is buckled, leave the patient in a semi-seated position. If the head of the stretcher is lowered, the strap will loosen enough to allow the patient to easily exit.
- The head of the stretcher can be raised to tighten the strap if the patient becomes hostile. Use caution when raising the head of the stretcher so as not to cause injury or asphyxiation.

**Additional Safety Considerations:**

- An EMS provider must remain with the patient at all times.
- Once in place, the safety belt should remain on the patient unless it is necessary to remove the safety belt to perform an invasive procedure on the patient.

## Clinical Indications:

- Patients exhibiting any of the following signs/symptoms that is unresponsive to de-escalation techniques:
  - Anxiety, agitation, confusion
  - Hallucinations
  - Delusional thoughts, bizarre behavior
  - Combative, violent
  - Expression of suicidal or homicidal thoughts
- Change in behavior that results from improvement or deterioration of patient condition, ie. hypoglycemia, overdose, intubation.

## Notes/Precautions:

- Use the minimum amount of force and restraint necessary to safely accomplish patient care and transportation with regard to the patient's dignity.
- Improperly applied restraints could possibly lead to permanent nerve damage, aspiration and death from respiratory compromise.
- Restraints may need to be removed if the patient starts to actively seize.
- NEVER transport a patient prone.

## Procedure:

1. Enlist the help of law enforcement.
2. Maintain a calm, reassuring and professional attitude and manner. Verbal de-escalation techniques should continue to be used to try to calm the patient.
3. If the patient is spitting, consider covering his/her face with a surgical mask (if no underlying respiratory problem) or with a NRB mask with oxygen. A NRB mask must always be used with oxygen.
4. Soft restraints should be attached to the cot frame and not the handrail or any movable part.
5. Handcuffs or flex-cuffs should be applied by law enforcement.
  - Once applied, a key must be available to EMS personnel or law enforcement officer must immediately follow the ambulance to the hospital.
6. Continuously reassess respiratory effort and CMS distal to the restraints during transport and document findings.
7. Notify receiving hospital to be prepared with security and their restraints.

## Documentation Requirements:

- Describe why an emergency existed.
- Failures of less restrictive methods of control (such as de-escalation).
- Why the restraints were used for the safety of the patient or others.
- How the reasons for restraint were explained to the patient (regardless of competence).
- The type/method of restraint used and which limbs were restrained.
- Injuries that occurred during the restraint procedure.
- Which agency placed the restraints on the patient.
- CMS, ABCs & any treatment given for complication from restraints.

## Clinical Indications:

- Extremity bleeding that is unable to be controlled with direct pressure and elevation.
- Prevention of hypovolemia due to extensive extremity trauma.

## Notes/Precautions:

- Once applied a tourniquet should not be released without the advice of medical control. The device may have caused a crush injury or compartment syndrome which requires further treatment.

## Procedure:

1. Place the tourniquet on the extremity above the wound, close to the wound, but not directly over the injury.  
- Depending on type of tourniquet, device may be able to be slid over the limb or you can open and close the device to secure it.
2. Secure the strap to the device and pull strap tight.
3. Twist the handle until blood flow is significantly slowed or occluded.
4. Secure the device from accidental release according to manufacturer instructions.  
(lock the handle into the triangle/clip or wrap strap around turnkey)
5. Document the date and time device was applied on the tourniquet and in PCR.

**\*\* Tourniquets should not be removed in the pre-hospital setting \*\***



**1**  
Apply tourniquet proximal to the bleeding site. Route the band around the limb and pass the tip through the inside slit of the buckle. Pull the band tight.



**2**  
Pass the tip through the outside slit of the buckle. The friction buckle will lock the band in place.



**3**  
Pull the band very tight and securely fasten the band back on itself.



**4**  
Twist the rod until bright red bleeding has stopped and the distal pulse is eliminated.



**5**  
Place the rod inside the clip; locking it in place. **Check for bleeding and distal pulse.** If bleeding is not controlled, consider additional tightening or applying a second tourniquet proximal by side to the first and reassess.



**6**  
Secure the rod inside the clip with the strap. **Prepare the patient for transport and reassess.** Record the time of application.



Auscultate chest for positive bilateral breath sounds & epigastric area for lack of abdominal air sounds. Secure airway in place & initiate EtCO<sub>2</sub> monitoring.

### PneuPac paraPAC 200D – FMA ONLY

Contraindication: cannot be used w/pt <5kg (11lbs)

Attach vent to disposable pt circuit kit. Use of a flexible tube extender may help prevent displacement.

Use settings from transferring facility if available

Set tidal volume to equal 6-8 ml for every kg of pt wt.

- Ex. 70kg = 560ml volume
- If hx of pulmonary disease, decrease volume by 100ml for pt <79kg & by 200ml for pt >79kg.

Set breaths/min at 10

Set "relief pressure" to 40 cmH<sub>2</sub>O

Connect to pt and gas supply

Switch ventilation to "On"

Observe for chest rise/lung expansion

To conserve gas supply in non-toxic atmospheres, select "air mix" with oxygen. Reduces concentration to 45%. This setting must be approved by transferring facility as appropriate for pt.

### AUTOVENT 3000

Contraindication: cannot be used w/pt <20kg (44 lbs)

Attach a disposable filter to vent valve. Attach to airway using a flexible tube extender.

Set tidal volume to equal 6-8 ml for every kg of pt wt.

- Ex. 70kg = 560ml volume
- If hx of pulmonary disease, decrease volume by 100ml for pt <79kg & by 200ml for pt >79kg.

Set breaths/min at 10

Attach to oxygen

Observe for chest rise/lung expansion

If pt is in cardiac arrest, set the inspiratory time control to either adult or child. Set breaths/min at 12. CPR may be continuous.

If pt begins spontaneously breathing, it may be advisable to decrease the ventilator rate. If pt has an effort >2cm H<sub>2</sub>O, the demand valve will activate and allow the pt to breathe even if rate is at zero.

If clinical signs of hypoxia persist or SpO<sub>2</sub> remains <92%, increase ventilatory rate, then if necessary, increase tidal volume in 100ml increments.



### Alarms or any suspected failure:

- Auscultate for positive bilateral lung sounds and absence of epigastric air movement.
- Check ET tube (or airway) for correct placement, blockage, kinks, and pilot balloon inflation.
- Check patient valve for foreign material or obstruction.
- Check breath indicator for positive function.
- Check hose assembly to control box.
- Check total volume and breaths/min control settings. Both excessive and insufficient tidal volume may cause problem.
- Check oxygen supply.
- If unable to promptly resolve suspected difficulty, disconnect vent and ventilate with BVM and high-flow oxygen. Recheck auscultation for positive bilateral air and lack of epigastric air exchange.

## Clinical Indications:

- Risk for hypovolemia (vomiting, diarrhea, non-traumatic bleeding)
- Syncope or near syncope (fainting)
- Dizziness

## Contraindicated for patients who:

- Have supine hypotension.
- Have a sitting blood pressure  $\leq 90/60$ .
- Have acute deep vein thrombosis.
- Exhibit the clinical syndrome of shock.
- Have severely altered mental status.
- Have possible spinal injuries.
- Have lower extremity or pelvic fractures.
- Are not mobile enough to get out of bed.

**Procedure:** Orthostatic vital signs (blood pressure, pulse, and symptoms) will be obtained and recorded while the patient is in the supine position as well as in the standing position. If the patient is unable to stand, orthostatics may be taken while the patient is sitting with feet dangling. Transport should not be delayed to obtain orthostatics in critical patients.

1. Instruct the patient on the process of orthostatic blood pressure measurement and its rationale.
2. Assess by verbal report and observation the patient's ability to stand.
3. Have **patient lie in bed** with the head flat for a minimum of 3 minutes, and preferably 5 minutes.
4. **Measure the blood pressure and the pulse** while the patient is supine.
5. Instruct **patient to sit for 1 minute**.
  - a. Ask patient about dizziness, weakness, or visual changes associated with position change. Note diaphoresis or pallor.
  - b. **Check sitting blood pressure and pulse.**
  - c. If the patient has symptoms associated with position change or sitting blood pressure  $\leq 90/60$ , put patient back supine or a position of comfort.
6. Instruct **patient to stand**.
  - a. Ask patient about dizziness, weakness, or visual changes associated with position change. Note diaphoresis or pallor.
  - b. If patient is unable to stand, sit patient upright with legs dangling over the edge of the bed.
  - c. The patient should be permitted to resume a supine position immediately if syncope or near syncope develops.
7. **Measure the blood pressure and pulse** immediately after patient has stood up, and then repeat the measurements 3 minutes after patient stands. Support the forearm at heart level when taking the blood pressures to prevent inaccurate measurement.
8. Assist patient back to bed in a position of comfort.
9. Document vital signs and other pertinent observations in the PCR. Note all measurements taken and the position of the patient during each reading.

## Evaluation:

- Subtract values 3 minutes after standing (or if patient cannot stand, then sitting) from lying values.
- **Positive Orthostatic Vital Signs:**
  - A decline of  $\geq 20$  mm Hg in systolic or  $\geq 10$  mm Hg in diastolic blood pressure after 3 minutes of standing.
  - A heart rate increase of at least 30 beats per minute after 3 minutes of standing may suggest hypovolemia.
  - A blood pressure drop immediately after standing that resolves at 3 minutes **does not** indicate orthostatic hypotension. However, this finding may be useful to confirm a patient's complaint of feeling dizzy upon standing and may lead to patient education about using caution when arising from a lying or sitting position.
- Report all findings to the treating medical provider, including all sets of blood pressure and pulse results, and whether the patient experienced pallor, diaphoresis, or faintness when upright.

**Clinical Indications:**

Paramedic

- Actual or perceived difficult direct laryngoscopy.
- Inability to visualize vocal cords or other airway anatomy necessary for proper endotracheal tube placement while performing standard, direct laryngoscopy.

**Contraindications:****Notes/Precautions:**

- None
- When assembled, do not hold the device above the purple gasket.
- Do not hold or attempt to use the device like a direct laryngoscope.

**Monthly Pre-Use Battery Check**

- Press the POWER button to turn the device on.
- The display should turn ON immediately. Note: No image will be displayed on the screen without an attached blade.
- A green LED indicator indicates good battery power.
- A flashing red LED indicator indicates minimal battery life & the batteries should be replaced.
- Press the POWER button to turn the device off.

**Procedure:**

- Install the display into the blade. Listen for a "click" which indicates the devices are secured together. The display & blade are color coded (white/black) for ease of assembly.
- Lubricate the ETT, the guiding channel, & the distal tip of the blade. Avoid covering the camera lens.
- Preload the ETT into the guiding channel with the distal tip aligned with the end of the channel. The tip of the ETT should not yet be visible on the camera. Alternatively, the ETT can be inserted into the channel after the blade has been inserted into the mouth and the vocal cords visualized.
- Press the POWER button to turn the device on. A moving image should be displayed.
- Insert the King Vision Blade into the Mouth by:
  - Open the mouth.
  - Suction blood/secretions/vomit from the mouth.
  - Insert the blade following the midline. Avoid pushing the tongue towards the larynx.
  - As the Blade is advanced into the oropharynx, use an anterior approach toward the base of the tongue. Watch for the epiglottis and direct the blade tip towards the vallecula to facilitate visualization of the glottis on the display's video screen. The blade can be placed into the vallecula like a Macintosh blade or it can be used to lift the epiglottis like a Miller Blade. For best results center the vocal cords in the middle of the display's video screen.
  - If the lens becomes obstructed, remove the blade and clear the lens.
  - Avoid putting pressure on the teeth.
- After you can see the vocal cords in the center of the King Vision display, advance the ETT slowly and watch for the cuff to pass through the vocal cords. Minor manipulation of the blade may be needed to align the ETT tip with the vocal cords.
- Stabilize/hold the ETT laterally and remove the King Vision from the mouth by rotating the handle towards the patient's chest. As the blade exits the mouth, the ETT should easily separate from the flexible lateral opening of the channel.
- Press the POWER button to turn the display off.
- After the procedure is complete, separate the display from the blade. Dispose of the blade and disinfect the display.

**Tips:**

- The most common issue associated with ETT placement with any video laryngoscope is that the blade tip has been advanced too far; there may be a good close-up image of the vocal cords, but the ETT cannot be advanced because the blade/camera is obstructing ETT passage. To address this:
  - Place the blade tip in the vallecula or,
  - If too close to the vocal cords, withdraw the blade slightly and gently lift in an anterior direction prior to attempting to advance the ETT.
- If the ETT tip is deflected off to the right due to the right aryepiglottic fold or arytenoid cartilage, twist the ETT counterclockwise 90° to deflect left toward the laryngeal vestibule.
- Manipulate the handle to direct the ETT tip toward the laryngeal vestibule (usually toward the left), then return to midline to advance through the vocal cords.

EMT or Above

### Clinical Indications:

- Patient in cardiac arrest

### Contraindications:

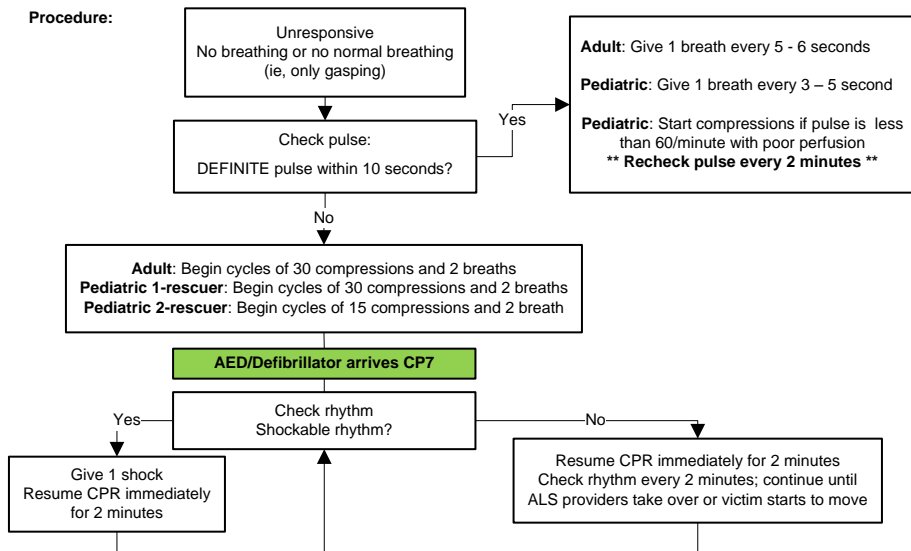
- None

### Notes/Precautions:

- Focus is on:
  - Minimal interruptions of compressions
  - Avoiding excessive ventilations
  - Appropriate depth and quality of compressions
  - Switch compression rescuer every 2 minutes if possible
- Defibrillate as quickly as possible if indicated.
- Refer to Cardiac Arrest Protocol at any time **M27**

In a tiered system, it may be appropriate for first responders to focus on continuous compressions w/AED and just passive oxygenation for the first three 2-minute cycles. After those 6 minutes, the NRB can be switched out for BVM or an advanced airway.

### Procedure:



Age	Location	Depth	Rate
Infant	Over sternum, between nipples (inter-mammary line); 2 - 3 fingers	0.5 - 1 inch (1/3 the anterior-posterior chest dimension). Allow for full chest recoil.	100-120 compressions/minute
Child	Over sternum, just above the xiphoid process; heel of one or two hands, as needed	1 - 1.5 inches (1/3 the anterior-posterior chest dimension). Allow for full chest recoil.	100-120 compressions/minute
Adult	Over sternum, just above the xiphoid process; hands with interlocked fingers	At least 1.5 - 2 inches. Allow for full chest recoil.	100-120 compressions/minute

### Recommendations for CPR after insertion of an advanced airway:

Once an advanced airway is in place, two rescuers no longer deliver "cycles" of CPR. Instead, the compressing rescuer should give continuous chest compressions at a rate of 100-120/minute without pauses for ventilation. The rescuer delivering ventilation provides 1 breath every 6 seconds for adults and 1 breath every 3-5 seconds for pediatrics.

## Below is graphical representation of the Team Approach (Pit Crew) CPR Procedure:

Use this approach when there are at least 3 providers to help minimize movement and maximize efficiency of rescue efforts. Infants and small children may require modification of the procedure due to size. If patient size prohibits access, use previous procedure.

### Person in Position 4 (P4) always just outside the "Triangle" of CPR

1. Team Leader Duties
2. May assist with airway preparation and securing if needed



### Person in Position 3 (P3) always at patients Head

1. Opens/clears Airway and insert OPA
2. Assembles/apply BVM
3. Provides 2 hand mask seal
3. Inserts/secures airway & ETCO<sub>2</sub> after 400 Compressions

### Person in Position 1 (P1) always on patients Right side

1. Initial patient assessment
2. Initiates 100 compressions
3. Ventilates in off cycle
4. Airway preparation in off cycle

### Person in Position 2 (P2) always on patients Left side

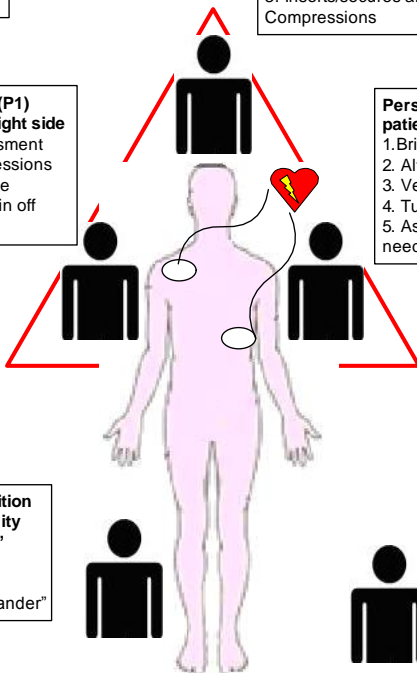
1. Brings and operates AED
2. Alternates 100 compressions with P1
3. Ventilates in off cycle
4. Turns on AED after 200 Compressions
5. Assist with airway preparation if needed

### Advanced Provider in Position 5 (P5) always at an extremity outside the CPR "Triangle"

1. Initiates IV/IO access
2. Administers Medications requested by "Code Commander"

### Advanced Provider in Position 6 (P6) always at an area outside the CPR "Triangle" near a lower leg and Operates the Monitor

1. Code Commander
2. Communicates/Interfaces with Team Leader
3. Makes all Patient treatment decisions



**Clinical Indications:**

- Recurrent or repetitive confirmed inappropriate discharge (shock) delivered to the patient by their AICD (device), specifically: the device repetitively delivers a shock to the patient when they are in a non-shockable rhythm).

**Contraindications:**

- Absence of visual confirmation that an inappropriate shock was delivered.
- Shock is being appropriately delivered by the device due to an underlying shockable rhythm.

**Notes/Precautions:**

- Various devices emit a tone when disabled or inhibited by magnet application. Absence of a tone does not necessarily indicate that the magnet is not functioning appropriately to disable the device.
- Various devices respond differently when an applied magnet is subsequently removed. Some devices will return to an active mode (where a shock can be delivered) while others will be disabled from delivering a shock to the patient until corrected by staff qualified to interrogate and program the device.
- If necessary to externally defibrillate or cardiovert a patient with a disabled/inhibited AICD that was malfunctioning, anterior-posterior placement of fast patches is preferred. If this is not possible, attempt to place fast patches at least 10cm away from the device.

**Procedure:**

- Monitor patient's ECG and confirm that an inappropriate shock was delivered.
- Locate the device on the patient.
- Place the donut magnet over the device (you may place a gauze pad between the magnet and the patient's skin for comfort).
- After deactivation/inhibition of the device, tape the magnet firmly in place.
- Treat underlying rhythms/conditions per applicable protocols.
- If the patient develops a shockable rhythm while the device is disabled/inhibited, remove the magnet and allow the device to function. If the device fails to deliver a shock to the patient), re-apply the magnet and treat the patient as if they did not have an AICD present.

## Clinical Indications:

Paramedic

- When vascular access is necessary for fluid and/or medication administration.

	Routine Medication Administration	Cardiac Arrest	Adult Lines Heparinized With
Hickman/Groshung/Broviac (Tunneled Catheter)	Allowed	Allowed	300u (100u/mL) heparin
Port (Tunneled Catheter)	Allowed *	Allowed *	500u (100u/mL) heparin
PICC	Allowed	Allowed	300u (100u/mL) heparin
IJ/Subclavian	Allowed	Allowed	300u (100u/mL) heparin
Short Term Dialysis Catheter (VasCath)	NOT ALLOWED	Allowed **	1000U/mL heparin Volume labeled on hub.
Long Term Dialysis Catheter (PermCath)	NOT ALLOWED	Allowed **	1000U/mL heparin Volume labeled on hub.

## Contraindications:

- None (when the table above is followed).

## Notes/Precautions:

- \* Port (Tunneled Catheter)s may not be directly accessed by paramedics. They may only be utilized when previously accessed by another provider and have a lock in place.
- \*\* Short term (VasCath) & long term (PermCath) dialysis catheters may only be accessed in cardiac arrest patients when IV or IO access is unsuccessful.

Procedure (Remember **SASH**):

- Hand hygiene.
- Thoroughly clean connection with alcohol swab for 10 seconds using a twisting motion (scrub the hub); allow to air dry for 30 seconds.
- For Short (VasCath) or long (PermCath) term dialysis catheters only:** Aspirate 5mL heparinized blood.
- Flush with 10mL Normal Saline.
- Aminister fluid and/or medication.
- Flush with 10mL Normal Saline.
- For all catheters other than short (VasCath) or long (PermCath) term dialysis catheters:** Heparinize.
- If heparin was not available after medication administration, notify the patient's receiving nurse that the line was utilized & has not been heparinized.

When in doubt as to kind of catheter, treat as if a dialysis catheter.

**Clinical Indications:**

- Adult patient in cardiac arrest

**Contraindications:**

- Device does not fit patient
  - Device will alarm if too small
  - You cannot lock the upper part of the LUCAS to the back plate
- Patient <age of puberty

**Precautions:**

- Minimize interruptions in chest compressions while placing the device

**Procedure:**

1. Power on device
2. Pause chest compressions at 2 minute cycle or when team is coordinated.
3. Place back plate under patient below the armpits.
4. Resume manual compression.
5. Attach LUCAS device to back plate making sure device is securely latched.
6. Position suction cup over the center of the chest with the outer edge immediately above the end of the sternum (xiphoid process).
7. Push down suction cup with two fingers (must be in adjust mode#1). Push the pause button (#2) to lock the compression pad in place.
8. Push Active button (#3) for either continuous (advanced airway in place) or 30:2 ratio.
9. Secure patient further with neck stabilization strap and hand straps as needed.
10. Press pause button for rhythm and pulse checks. Push active button to continue.

**Special Notes:**

- Defibrillation can be performed while the LUCAS operates. Make sure that pads and cables are not under the suction cup. If so, they need to be replaced in another location.
- Suction cup position should be checked after any patient movement or defibrillation. Push #1 Adjust to position.
- Clean device with Sani-wipes after each use. If grossly contaminated, replace suction cup.
- Battery life is approximately 45 minutes and it takes approximately 4 hours to fully recharge.
- If patient wakes or shows signs of discomfort during use, paramedics should refer to the sedation section of protocol U3.



## Clinical Indications:

- WVSM is a single or multi-parameter vital signs monitor for ECG, non-invasive blood pressure (NIBP) and SpO<sub>2</sub>. The WVSM uses wireless communication to transmit vital signs data to a handheld device, such as an iPad or iPod.
- Common application:
  - Large scale incidents with multiple patients
  - Firefighter rehabilitation

## Contraindications:

- Inappropriate sized blood pressure cuff:
  - Do not use the WVSM on neonates or pediatrics.
- Wet conditions:
  - This device must remain dry and cannot be used in conditions where fluids would penetrate the device.

## Notes/Precautions:

- To view wireless data transmission, initiate the WVSM app on the iPad or iPod.
- The WVSM internal battery provides approximately 7 hours of continuous use.
- The actual monitor is meant to attach to the BP cuff via the Velcro on the back.
- The charging port is on the top. All other ports on the top of the monitor can be ignored.
- Blood pressure cuff may be cleaned in the washing machine. The rest of the monitor and cables may be cleaned with traditional supplies used to clean equipment.

## Procedure:

### Turning the device on:

1. Press and HOLD the power button. Once the menu appears, press blue "WiFi" button to begin with a new patient.

### Obtaining a blood pressure:

1. To apply the Orbit B/P cuff, slide the sleeve up the patient's arm, ensuring the artery arrow points down the arm. The cuff should be midway between the elbow and shoulder.
2. Be sure the ARTERY indicator is over the patient's brachial artery, between the bicep and tricep muscles.
3. Wrap the cuff snugly around the patient's upper arm and connect cuff with the monitor.
4. Press gray BP button to obtain a BP reading.

### Obtaining pulse oximetry:

1. Attach pulse oximeter to the bottom of the monitor in the correct place. Attach to patient.

### Obtaining an ECG reading:

1. Insert ECG cables into matching colored ECG cable input at the bottom of the device.
2. Attach patches and cables to patient.

## Documentation requirements:

- At this time, the vital sign information obtained on the WVSM is not able to transmit into the E-PCR. All vital sign information will have to be manually documented.

CL1

For sites that  
have this device

**ACTION:** To ventilate a patient who has a complete airway obstruction that cannot be ventilated adequately by ANY other means.

## INDICATIONS:

- Primary use is in patients whose airway cannot be secured by intubation or secondary airway adjuncts. For use in patients greater than 45 kg and greater than 12 years of age. Reasons may include:
  - Airway obstructions
  - Rescue airway technique
  - Severe maxillofacial trauma
  - Upper airway edema

## Equipment:

- Quicktrach kit
- Scalpel
- Oxygen source
- Chlorhexidine, lidocaine (Xylocaine), dressing

## Procedure:

- Identify the cricothyroid membrane
- Prep area with Chlorhexidine: anesthetize if time allows
- Attach the syringe to the Quicktrach
- Utilize scalpel to perform a cut down to visualize landmarks if needed
- Puncture needle into airway through cricothyroid membrane at a 90 degree angle
- Aspirate air as the needle is inserted to verify placement
- Once able to aspirate air, change the angle to 45-90 degree and advance the catheter caudally
- Advance to the level of the red stop guide: remove the stop guide
- Holding the needle and syringe firmly: advance the plastic cannula over the needle until the green safety mechanism locks (this essentially sheaths the needle tip to lesson injury to the posterior trachea)
- Continue the advancement of the Quicktrach until the flange rests on the neck
- Carefully remove the needle and syringe
- Secure the cannula
- Attach the connecting tube and the bag-valve mask (BVM) for ventilation with high-flow oxygen
- Confirm placement by auscultation and adequate chest rise

## Potential Complications:

- Aspiration
- Laceration to cricothyroid membrane
- Subcutaneous emphysema
- False passage
- Sub glottal edema
- Bleeding
- Infection

At the minimum, a starting and ending temperature will be documented on the PCR.

## DATA THERM II PROCEDURE

- The monitor should always display the time even when off. If no time is displayed, change batteries.
- Flexible probe may be placed in either esophagus or rectum. Probe should be placed deep enough that it is not influenced by ambient air.
- When turned on, monitor will start continuously monitoring temperature

## Settings

- Press the mode button to select operating parameter to change settings. Once in desired parameter, press ↑ or ↓ buttons to change setting.
  - High temp alarm setting- currently set at 38.5°C (101.3°F)
  - Low temp alarm setting- currently 32.5°C (90.5°F)
  - Hour setting mode for device time
  - Minute setting mode for device time
  - Memory data capture interval hour selection- currently 0
  - Memory data capture interval minute selection- currently 5
  - Celsius and Fahrenheit scale selection
  - Visible LED alarm- currently "Y"/yes for on
  - Audible buzzer alarm-currently Yes for on
  - Delete memory and accept changes-select "Y" for new settings (delete memory) or "N" to retain existing data

## Alarms

- HI- Temperature measured was higher than specified operating range (>113°F)
- LO- Temperature measured was lower than specified operating range (<62.6°F)
- Err- Probe connection error. Ensure the probe is connected.
- EEP<sub>Err</sub>- Memory function error. The unit has a circuit error, Do Not use. Report unit for service.

## PHILLIPS MRX PROCEDURE:

- It can monitor rectal and esophageal temperatures.
- It can display temp in either Fahrenheit or Celsius. The default is Celsius, which can only be changes through Configuration Mode.

### Monitoring Temperature:

- Connect the temperature cable to the MRx.
- Select the correct Temperature Label for your measurement.
- Check that the device settings (including alarm settings) are appropriate for the patient.
- Apply the temp probe to the patient.

## LIFEPAK 15 PROCEDURE:

- The temperature will not display until it is between 24.8° and 45.2° C (76.6° and 113.4° F)
- The display is configured to display in Fahrenheit but can be changed to Celsius
- Allow up to 3 minutes for probe to equilibrate after placing on patient

### Monitoring Temperature:

- Connect adapter cable to TEMP port on monitor
- Connect temperature probe to adapter cable
- Place temperature probe on patient according to probe instructions for use
- Confirm temperature reading appears and is stable

**Each monitor has its own temperature probe and they are not interchangeable. All probes are disposable and should not be reused. However, if there is a connector cable between the probe and the monitor, those are reusable and should be cleaned after each patient use.**

## CARDIOVERSION Clinical Indications:

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia)

## Contraindications:

- Patient is NOT pulseless (the pulseless patient requires unsynchronized cardioversion, i.e. defibrillation)

## Procedure:

1. Attach standard Four-lead monitor.
2. Apply defibrillation hands free pads. These can be applied either anterior-posterior (over sternum and middle of back), or anterior-lateral (over upper right chest and lower lateral left chest). Attempt to avoid placing pads directly over implanted devices or medication patches.
3. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
4. Consider the use of pain or sedating medications per guideline.
5. Set energy selection to the appropriate setting.
6. Set monitor/defibrillator to synchronized cardioversion mode (press the "Sync" button once pads are connected).
7. Make certain all personnel are clear of patient.
8. Press and hold the shock button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to "synchronize", so there may be a delay between activating the cardioversion and the actual delivery of energy.
9. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient's rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation.
10. If the patient's condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings and ensuring "Sync" each time.
11. Repeat until maximum setting or until efforts succeed. Consider discussion with Medical control if cardioversion is unsuccessful.
12. Note procedure, response, and time in the patient care report (PCR).

## TRANSCUTANEOUS PACING Clinical Indications:

- Patients with symptomatic bradycardia (less than 60 per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
  - Chest pain
  - Hypotension
  - Pulmonary edema
  - Altered mental status, confusion, etc.
  - Ventricular ectopy

## Procedure:

1. Attach standard Four-lead monitor.
2. Apply defibrillation hands free pads. These can be applied either anterior-posterior (over sternum and middle of back), or anterior-lateral (over upper right chest and lower lateral left chest). Attempt to avoid placing pads directly over implanted devices or medication patches.
3. Select pacing option on monitor unit.
4. Adjust heart rate to 80 BPM for an adult, contact Medical Control for Pediatric.
5. Note pacer spikes on EKG screen.
6. Slowly increase current until capture of electrical rhythm on the monitor. (Average transcutaneous capture doesn't start until approx 60-70 mAmps.)
7. If unable to capture while at maximum current, stop pacing immediately.
8. If capture observed on monitor, check for corresponding pulse and assess vital signs.
9. Consider the use of sedation or analgesia if patient is uncomfortable.
10. Document the dysrhythmia and the response to external pacing with ECG strips in the PCR.

**Indications:**

- Requested by MN law enforcement to collect blood for drug testing.

**Contraindications:**

- None, unless patient is too combative to safely draw. You can draw even if patient is refusing as law enforcement has a warrant.
- Students will not be allowed to perform a legal drug draw.

**Materials:**

- All contained in the approved specimen box.
- Will also need tourniquet, band aid and 2x2.

**Procedure:**

1. Remove all components from a sealed MN kit box. Check both tubes for powder and box for expiration date.
2. Identify patient is who is noted on the identification sheet and the medical personnel certificate.
3. Use proper hand hygiene per policy and standard precautions per direct patient care and potential exposure to body fluids. Avoid the use of alcohol-based hand wash prior to the draw.
4. Position patients by having the arm extended to form a straight line from the shoulder to the wrist.
5. Apply tourniquet around the arm 3 to 4 inches above the venipuncture site. Tourniquet application for vein selection must not exceed one minute. Release and reapply if needed.
6. Ask patient to form fist, if possible.
7. Select vein site. Avoid sites with excessive scarring, shunts, hematomas, or the side of a mastectomy.
8. Cleanse the blood collection site with the alcohol-free prep pad provided. Following normal aseptic procedure and using a sterile needle, tube and needle holder, and blood tubes provided, withdraw blood specimens from subject, allowing both tubes to fill to maximum volume.

A. Anchor the vein by holding the patient's arm and drawing the skin taut over the intended puncture site.

B. Puncture the vein with the bevel of the needle up and at an angle of 15-30 degrees.

C. Keeping the needle as stable as possible, push/connect the first tube onto the needle.

D. Allow the tube to fill until the vacuum is exhausted and blood ceases to fill the tube.

E. Release the tourniquet as soon as possible after the blood begins to flow.

F. Remove the tube from the holder and insert the next tube.

\*\*\*If any part of the blood collection kit is defective, you must use an entirely new kit as everything is numbered for each specific kit.

**NOTE:** Immediately after blood collection, assure proper mixing of anticoagulant/preservative powder by slowly and completely inverting the blood tubes several times.

9. Bandage the arm, checking to ensure that bleeding has ceased. If bleeding persists longer than normal or patient is taking an anticoagulant, the arm may need to be wrapped with gauze or coban and the patient is instructed to leave on for one hour.
10. Dispose of needle and blood collection device in sharps container.
11. The investigating officer will be filling out the information on the Blood Tube Labels, Medical Personnel Certificate, and the Sample Identification And Information Sheet. Help to make sure it is complete and fill out your information and sign where necessary.
  - A. Do NOT place the label over the stopper of the vacutainer.
  - B. Place sealed specimen holder inside the plastic bag, squeeze out excess air and close bag. Do NOT remove liquid absorbing sheet from plastic bag.
  - C. Law enforcement will take care of the rest of the evidence packaging.
12. Fill out ePCR with patient's demographic information, history, meds and allergies and requesting agency. In your narrative document your aseptic technique while using only the box's contents, collection site and time. The time documented in the ePCR and the collection forms should match. Also document if there were any complaints from the patient or deviations from procedure.
13. If unable to collect blood, discuss with law enforcement that the patient may need transport to a hospital.

Suggested ePCR Narrative: Requested by \_\_\_\_\_ (agency) to perform a blood draw at \_\_\_\_\_ (Clay County Jail, etc). I used the provided MN kit and used aseptic technique with the provided povidone pad. The sample was taken from the \_\_\_\_\_ arm at \_\_\_\_\_ (time). The patient and sample were left in the custody of \_\_\_\_\_ (officer or agency).

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# Special Considerations

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**Standard:**

To insure that team members report suspected domestic violence, vulnerable adult, elder and child abuse cases according to North Dakota law section 55-25.1-03 and Minnesota law 626.556.

**Purpose:**

Under the Child Abuse Prevention and Treatment Act (CPATA), child abuse and neglect means, at a minimum, "Any recent act, or failure to act, on the part of a parent or caretaker, which results in death, serious physical or emotional harm, sexual abuse, or exploitation, or an act or failure to act which presents an imminent risk of serious harm" By state law, all healthcare providers are obligated to report cases of domestic violence and child abuse.

**Indications:**

Suspicion should be aroused when any of the following signs are observed on the patient or at the scene:

- Discrepancy between the condition found and the history of onset given by the guardian or caretaker.
- When history or onset given by guardian differs from that given by neighbors or witnesses.
- Extreme behavior changes when a guardian walks into the room, fear of an adult, very aggressive or very shy. Not acting age appropriate.
- Signs of neglect (inappropriate clothing for weather, inadequate hygiene, physical signs of malnutrition).
- Several injuries or bruises in various stages of healing
- Fingerprints or linear belt marks anywhere on the body
- Cigarette-like burns anywhere on the body
- Human bite marks
- Patchy baldness
- Severe head injuries
- Crib death
- Dislocation injuries in a child
- Abdominal or genital injuries
- Defensive injuries
- Repeated EMS requests.

**Procedure:**

- Immediately request law enforcement assistance, ensure scene safety
- Universal patient care protocol U2
- Assess patient for signs of physical abuse
- Do not initiate a report to law enforcement or social services in front of the patient, parent, or caregiver. This should be communicated privately.
- If sexual abuse/assault is suspected
  - The patient should not change clothes, eat or drink, use the bathroom, wash or bathe until after the exam at the hospital
  - Psychological support is paramount
  - Avoid questions about the event
  - Treat vaginal/rectal bleeding as traumatic bleeding
- Do not confront or become hostile to the parent or caregiver
- Notify accepting hospital providers of suspected domestic violence, abuse, or neglect
- Document, in their own words (in quotation marks), all statements by the patient, the parent or caregiver, including statements made about the manner of the injuries
  - Only report things that are pertinent to the patient in the PCR. Anything related to the abuse/neglect of the patient needs to go into an incident report.
  - In the incident report:
    - Any abnormal behavior of the patient, parent or caregiver
    - The condition of the environment and other residents present
    - The personnel that you reported the incident to.

**Reporting Abuse/Neglect**

- After completion of the call, submit incident report on Ninth Brain and contact the on-call leadership member
- It is not enough to tell suspicions to law enforcement or accepting physician. All EMS suspicions of abuse will be reported to social services as soon as possible but no longer than 24 hours.

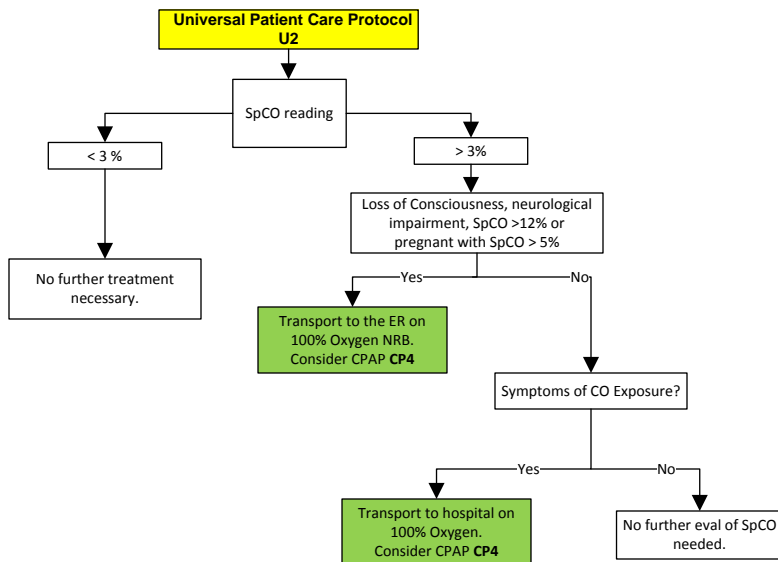
**Minnesota:**

- If immediate assistance is needed call dispatch and request the on call social worker/law enforcement
- Call **1-844-880-1574** or report online at [mn.gov/dhs/reportadultabuse/](http://mn.gov/dhs/reportadultabuse/)

**North Dakota:**

- If immediate assistance is needed call dispatch and request the on call social worker
- For child abuse/neglect call the county child intake line and fax SFN960 form(<http://www.nd.gov/eforms/Doc/sfn00960.pdf>) to the appropriate county
- For vulnerable adult call **1-855-462-5465** and fax form found on ninthbrain or <https://fw2.harmonyis.net/NDLiveIntake/>

<p><b>History:</b>                  PMH/Medications/Allergies                  Recent illness or trauma                  Duration and Concentration of Exposure                  Type of Chemical or toxic Exposure                  Enclosed or open space exposure                  Presence of fire, smoke or distinctive odors</p>	<p><b>Signs and Symptoms:</b>                  CNS: Headache, Dizziness, Blurred vision, Seizures, Weakness, Coma, Confusion                   Cardiac: Tachycardia, Dysrhythmias, Palpitations, Chest Pain, Cardiac arrest, Hypotension, Syncope                   Respiratory: Dyspnea, Tachypnea, Pulmonary Edema, Apnea, Nausea/                  Vomiting                  Cherry red skin (late sign)</p>	<p><b>Differential:</b>                  Medical vs. Trauma</p>
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**Things to Remember:**

- Assess scene for safety. Do not allow yourself to become a victim and do not attempt any rescue that you have not been trained in and do not have the proper safety equipment for.
- Carboxyhemoglobin levels do not always correlate with the signs and symptoms of CO poisoning. CO monitoring should be used in correlation with good patient Hx and assessment to determine appropriate treatment.
- The presence of CO can cause pulse oximetry readings to be artificially high. Interpret with extreme caution.
- Initiate cardiac monitoring in patients >40 years, or those with chest pain, difficulty breathing or other serious symptoms. Obtain 12-lead ECG.
- The signs and symptoms of CO poisoning are often vague, non-specific and imitate other illnesses. CO poisoning should always be excluded as a possible cause of your patient's complaint in the pre-hospital setting.
- Fetal hemoglobin binds with CO easier than adult hemoglobin. Any pregnant patient with a SpCO > 5% should be evaluated by a physician.

## Clinical Indications:

- To continue blood transfusion for out of town transfer, per continued care of Doctors Orders.

## Procedure:

- Assess blood product for discoloration, clots, cloudiness and integrity of seals.
- Obtain a full set of vital signs including temperature prior to administration and every 5 minutes for first 30 min, and every 10 min throughout transfer.
- Prime filtered blood tubing with 0.9% Normal Saline, to be gotten at hospital.
- Administer blood products per physician order. Flush the filtered blood tubing after transfusion is complete.
- Return paperwork to sending facility as requested.

## In the event of a transfusion reaction:

- Stop blood transfusion immediately if any 2 of the following signs or symptoms are present.
  - Chest pain, flushing, rash, anxiety, generalized pain, febrile, shortness of breath or shivering
- Refer to anaphylaxis protocol **M6**
- Prime new administration set with Normal Saline. Infuse to keep open (TKO)
- Call medical control as needed for further orders
- Remove blood tubing and blood product and place it in a sealed plastic bag. Place the unit tag in a separate bag.
- **Return the blood component, tubing, and transfusion reaction report to Transfusion Services @ initial hospital**

## Transport of blood products

- Blood products need to be packaged in the designated cooler provided by the lab.
- Check indicator on outside of the blood product to ensure that it is safe to administer according to the institution's protocol. This varies between institutions, please verify prior to transport. Sanford's Health's indicator is red if blood product needs to be discarded.
- If not in the cooler, blood needs to be administered within 30 minutes.
- Promptly return any unused blood to sending lab.



# Exercise-Induced Medical Conditions

**SC5**Usually FMA only,  
or special events

## To be used when assisting with marathon events or as directed by medical control.

### Purpose:

This protocol is intended to highlight specific conditions in sick athletes and should be in addition to the standard protocols.

### Medical Emergencies:

- **ALTERED MENTAL STATUS:** check temperature and glucose, treat per protocol. Start IV fluids. If able to do so safely and an electrolyte drink is available, encourage patient to drink.
- **CARDIAC ARREST:** Follow ACLS guidelines except consider glucose and temperature immediately as contributing factors. Give 100ml D10 early in the resuscitation.
- **HYPERTHERMIA:** Defined as >103°F orally. Cool immediately with ice packs or wet towels in groin, axilla, and around head. May give cooled normal saline up to 2L. Stop if patient begins shivering or temp <100°F. Monitor temperature. If patient is agitated or has a clenched jaw defer taking an oral temp until the ED.
- **HYPOTENSION:** Leg and pelvic elevation. Pelvic elevation is key. IV fluids should be given and titrated to a systolic BP of 90. Fluid should be limited to 3L maximum.
- **HYPOTHERMIA:** Defined as <96°F orally. Get rid of wet clothing and warm with blankets and warm environment.
- **MUSCLE CRAMPING:** (unrelieved with passive stretching and oral rehydration) Give 1L normal saline IV. Consider fentanyl and/or versed as needed for pain. Special note: patients of African descent with history of Sickle Cell disease or trait with no visible muscle rigidity should be transported immediately for possible sickle cell crisis.
- **NAUSEA &/OR VOMITING:** 4mg Zofran IV/IN (IV over 2 min), consider IV fluids up to 2L, but attempt to have the patient drink an electrolyte drink if they are able to maintain a.s.a.p.
- **SEIZURES:** May be due to hyponatremia. Give 250ml IV boluses in addition to standard dose of versed.

### Patients Refusing Transport:

- Hyponatremia may cause headache, confusion, and puffiness. Any patient refusing transport should be carefully evaluated for the above prior to their release.
- All patients must have a full set of vitals, including temperature and blood sugar taken prior to release.

### Medical Aid Stations or Athletic Trainers:

- Patients with the following conditions may be referred to the nearest aid station or athletic trainer instead of transport after an initial assessment reveals no other significant problem. Note that during times of MCI, triage and referral to other resources will be essential.
  - Abrasions
  - Blisters
  - Cramps
  - Exhaustion
  - Chaffing
  - Joint injuries/pain

**Standard:**

Provide supportive care for terminally ill or code level II patients actively dying. The purpose of this document is to provide medically acceptable parameters for emergency medical service personnel to provide supportive measures to patients in the process of dying. It is recognized that the delivery of CPR and/or advanced life support is not necessarily appropriate treatment for all patients. It is further recognized that CPR is rarely successful in restoring life if ALS is not available within a certain period of time. Inappropriate resuscitation efforts are financially and emotionally taxing to family members and EMS providers and may actually pose a risk to EMS providers and to the public.

**Indications:**

PT meets criteria:

- Hospice
  - Can be either Code I or Code II. A code level sheet should be located in plain view, usually on the PT fridge.
- Terminally ill
- DNR patients actively dying (Code Level II present)

Not intended for:

- PT with correctable illness with a current DNR. (I.E. STEMI, Pneumonia, UTI)
- Code level I patients

**Procedure:**

Assure PT is in position of comfort. Position the PT airway for ease of breathing. Oxygen may be applied as a comfort measure. PT family may need emotional support, clergy or a family friend. Emotional support is as important as medical support. When at all possible, EMS should attempt to comply with the patients and family wishes as much as practical. Determine and respect any cultural and family beliefs and values placed on the end of life process and perceived pain.

**Hospice PT-** If the PT is a Hospice PT, call the on call nurse during business hours or the Hotline after hours. Hospice wants to be informed of all EMS contact with the PT and aware of the situation.

- Hospice can be reached at (800)237-4629 (Mon-Fri 0700-1800)
  - [In Luverne, call 507-283-1805](#)
- An answering service is available at the same number after hours. They will in turn page the on call staff and alert them of the situation.
- Be sure to let the party know what "team color" the PT is under. This is located with the PT Hospice information, usually located on the fridge with the code level. Each Hospice patient is designated a team of providers and given a color that corresponds.

**Paramedic Care:**

**Hospice PT-** If PT requires pain management; ask family if the PT has been given his/her scheduled medications. If this is not relieving PT discomfort, Hospice staff may have additional orders in place. Contact on call staff to request information. If there are not additional orders in place, the Pain Management Protocol may be used. Report to on call RN what was given. As pain management begins, maintain clear and open communication with the patient and family. Even unresponsive patients may be able to hear, as hearing is the last sense lost as coma develops.

**Terminally ill/Code Level II – Use Pain Management Protocol.**

- **Fentanyl** 0.5-1.5 mcg (150 mcg.) May repeat after 5 min and every 30 minutes thereafter PRN. IV/IO
- **Versed 1.0-2.0 mg**
- **Consider Zofran 4.0 mg over 2 min.** for nausea. Dose may be repeated once in 20 min PRN.

Contact medical control if PT or family wants PT to remain at home after medication administration. Vital signs do not have to be obtained and PT should be kept as comfortable as possible.

**In the event of Patient Death:**

Take time to console the family. Use direct words such as dead and deceased. If the PT is in a bed, draw a sheet up to their head. It is not necessary to cover the face as the family may wish to see and be with their loved one. Help the family contact Hospice or funeral home as needed. Law enforcement may be present to help with this.

**Hospice PT-** Hospice staff need to be contacted for deaths. Social Workers are available for families and can be contacted through the on call staff.

**Terminally ill/Code Level II-** Refer to Terminating or Withholding Resuscitation Protocol.



# Public Safety Standby (Fire, Hazmat, Bomb, SWAT)

SC7

This card is used for initial response to public safety standbys. MCI task cards should be utilized as the need is identified.

## ENROUTE TO THE CALL

- How big is the event? (house, apartment bldg, commercial) Occupied?
- Assign ICS positions according to task cards? Announce EMS Ops position over radio
- Place radio to scan and listen to police and fire channels
- Obtain information from Dispatch regarding wind speed and direction
- Contact Hospitals and give them a "heads up" of situation based on level of threat or situation

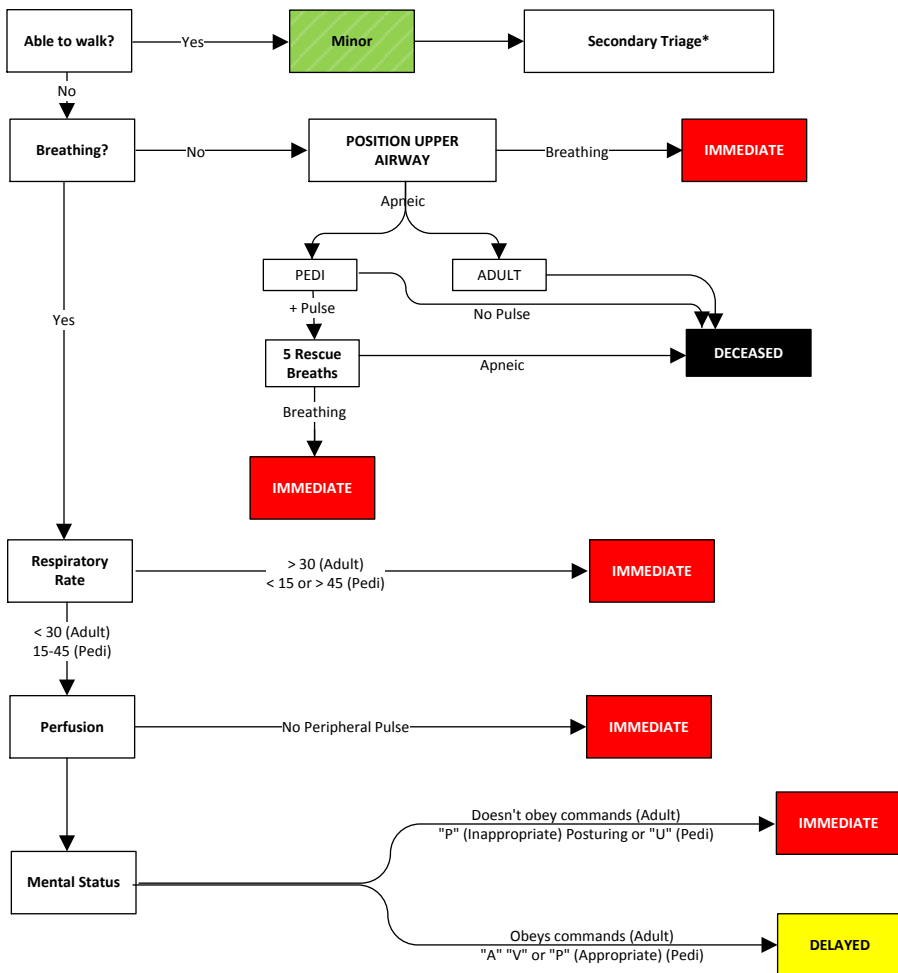
## ON SCENE

- Give on scene initial report which includes: routing to scene, staging area for EMS resources, what is showing (smoke, flames), what type of building, etc.
- Establish contact with Incident Command
  - Possible number of patients
  - Update dispatch with info
- Place vehicle to allow for immediate transport away from scene
  - Consider possible obstacles: hydrants, hoses, fire engine, other vehicles
- Triage Officer:
  - Get appropriate resources out of truck and prepare for immediate treatment
  - O2 bag, med bag, and monitor on cot, out of truck and close to collection area.
- Determine need for additional resources
  - Mutual aide, to be paged out by Disptach
  - All page/notify leadership
  - Helicopter (landing zone?)
  - MCI Truck (6754), Ambus (6780), ICS bus (6762) are resources that FMA can provide
    - MCI Truck (2115) is available in TRF
- Establish Pt. collection area (consider proximity to event: Hazmat cold zone, wind direction, etc)
- Consider need for Firefighter rehab SC11

## Special HazMat considerations:

- **Has substance been identified?**
- **Obtain treatment specifics from ERG (in every ambulance), HazMat team, poison control.**

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**Things to Remember:**

- \* Using the Jump Start Algorithm, first evaluate all children who did not walk under their own power.
- All EMS providers are encouraged to use the Triage Algorithm any time there are more than 2-3 patients requiring evaluation, treatment or transport.

# Incident Response Plan

SC9

- Most incidents can be handled by the first responding crew, supervisor, and system resources.
- Incidents with large numbers of patients (typically >10) may need additional command positions, divisions, patient collection sites, and/or exceed readily available system resources.
- SC9 and SC10 are meant as a quick reference. Be sure to use MCI task cards as they list all officer duties.

## EVENT COMMUNICATIONS:

- First unit on scene will give a scene size-up to dispatch. EMS Command and/or Dispatch may request event communications to move to a secondary channel.
- Use plain English vs. 10-codes, e.g. "agency name" to Dispatch Center "agency name".
- Once on scene the crew announces their arrival and gives on scene report
- Refer to specific guidelines for special incidents: HazMat, Police Tactical Operations, Fire Standby, Water Rescue, etc.

### FIRST ARRIVING CREW:

Establish EMS Incident Command – see below and Triage – see SC10 & SC 8

### 2nd IN or LATE ARRIVING AMBULANCES:

(Refer to SC10) Report to Staging.

### EMS OPS/Crew Chief or EMS Manger:

Responsible for all EMS Command and Control Activities, & for continued operation until delegated.

#### Enroute:

- Ensure sufficient response based on initial reports.
- Consider size of response and staff.
- Confirm activation of emergency notification plans have been activated by dispatch.
- Contact Dispatch to place MCI alert status for area hospitals.

#### On Arrival:

- Scene Safety Size-up (Hazmat, secondary hazards).
- Ensure safety of initial crew deployment.

#### When Assuming Incident Command:

- Broadcast assignment/change in EMS Command.
- Establish Unified Command.
- Do hazard assessment with Unified Command.
- Ensure crews are wearing proper PPE.
- Update Dispatch frequently.
- Reassess resource needs.
- Consider the need for divisions to manage MCI
- If Unified Command Post is distant from incident site, consider establishing an Operations Supervisor.
- Consider off-site Staging and Staging Officer.
- Consider Calling WTAS for MCI Trailer.
- Consider additional staff/supervisors.

#### Coordinate w/Unified Command for the following:

- City or school buses for transport or shelter.
- Red Cross.
- Salvation Army.

## EMS OPS/TRANSPORTATION

(Blue Vest - Report to Incident Commander when appropriate)

### SCENE SIZE-UP

- ♦ Name of Person who is EMS OPS: \_\_\_\_\_
- ♦ Number of Patients: \_\_\_\_\_
- ♦ Best Route In: \_\_\_\_\_
- ♦ Best Route Out: \_\_\_\_\_
- ♦ Staging Location: \_\_\_\_\_
- ♦ Advise if there are multiple patient collection sites
- ♦ Coordinate with Triage Officer
- ♦ EXPEDITE TRANSPORT

Obtain triaged patient information from Triage Officer

G \_\_\_\_\_ Y \_\_\_\_\_ R \_\_\_\_\_ B \_\_\_\_\_ W \_\_\_\_\_

### Is Supervisor assuming EMS OPS?

Yes - Assume role of Transportation Officer or other duties as assigned

No - Remain EMS OPS and assume responsibility of the Transportation Officer.

### HAZMAT RESPONSE:

- Identify safe access routes and staging areas.
- Ensure proper use of protective equipment.
- Consult with Incident Commander to establish cold zones and decontamination process.
- Collection of patients in Cold Zone is preferred.
- Decontaminate patients prior to triage and transport.

## TRIAGE OFFICER (Orange Vest - Reports to EMS OPS)

### Responsible for all patient care activities

Complete Rapid Assessment: (Report findings to EMS OPS)

- ♦ At small incident, primary role is to identify critical pts.
- ♦ Identify and corral "walking wounded"
- ♦ Prepare patients for rapid transport

Organize Pt. Care Activities

- ♦ TRIAGE pts, consider triage tags
- ♦ Perform life-saving treatments only
- ♦ Early transport of critical pts.
- ♦ Direct First Responders caring for multiple pts.

*Coordinate with Transport Officer/transport crews -expedite transport.*

### TRIAGE

#### GREEN

- ♦ "Walking Wounded" or injuries treated by first-aid alone

#### YELLOW

- ♦ Follows simple commands
- ♦ Minor injuries but unable to ambulate

#### RED

- ♦ Respiratory Distress
- ♦ Signs of Shock
- ♦ Unable to follow simple commands

### TREATMENT OFFICER

- ♦ Triage Officer assumes role of Treatment Officer unless it is assigned to someone else
- ♦ Organize medical care in treatment area
- ♦ Determine need for supplies and staff in treatment area
- ♦ Provide for medical need of all "walking wounded"

## TRANSPORTATION OFFICER

- ♦ Coordinate ambulance movement and loading
- ♦ In/Out Routes kept open. Keys remain in ignition
- ♦ Expedite transport of patients

If large incident with delay in moving patients (>20 pts), consider need for Staging and Treatment Officers. Establish Pt. Collection Area.

## 2nd IN or LATE ARRIVING AMBULANCES

### Notification

Outside normal PSA, Mutual Aid crews use "Dept Name & Crew #" to identify themselves.

Crews will contact the agency controlling the event.

Once on scene the crew announces their arrival and establishes contact with EMS OPS.

Approach scene using designated route to avoid hazards.

### Arrival at the Scene

Leave keys in ignition

Stay inside ambulance at Staging Area until assigned

Remember other vehicles, do not block entry/exits

Quickly load patients and provide treatment en route

### Leaving the Scene

Notify Transportation Officer when leaving scene with number of patients and obtain destination from him.

Contact your communication center and advise them of your status.

When clearing hospital, report back to staging or contact your communication center for assignment.

## STAGING OFFICER

- ♦ Respond to requests for ambulances from EMS OPS and Transportation Officer.
- ♦ Direct movement of ambulances from staging area to Patient collection area. Provide a route.
- ♦ Keep EMS OPS updated on resources in staging
- ♦ In large incident, no difference between ALS and BLS

## REHAB TREATMENT SUPERVISOR

Report initially to EMS Operations Supervisor  
 This can also be used on fire scenes when there is no Ops Supervisor

\*\*This card may be used as a reference for an personnel working in the rehab sector.

### DO YOU NEED HELP?

Yes – request assignment of treatment leaders. They will complete #2 below. Give them appropriate vest and task card.

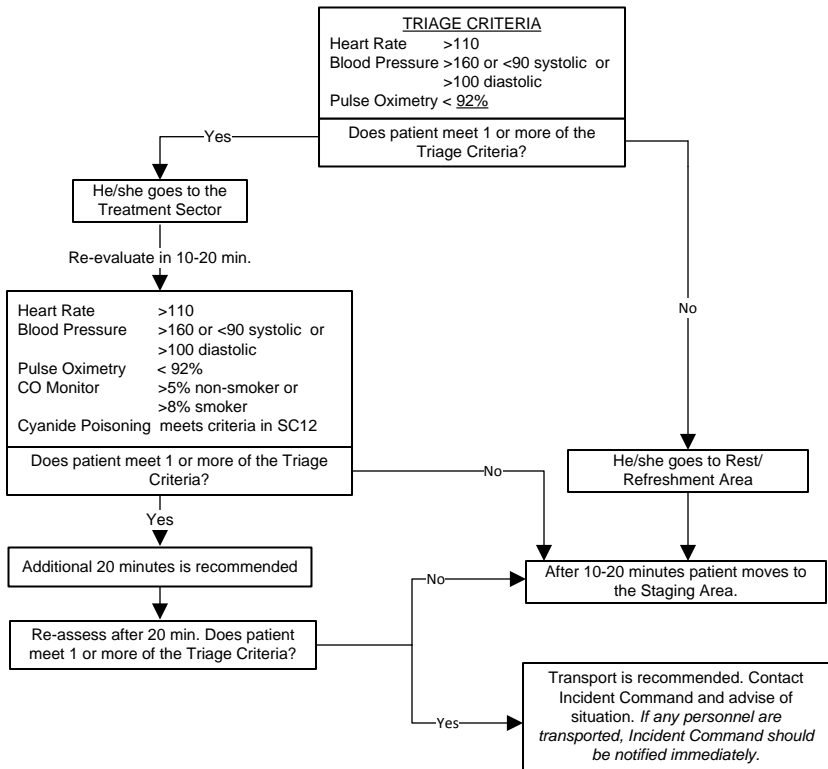
No – complete all items on this task card.

### 1. ESTABLISH A TREATMENT SECTOR/GROUP

The site should be located next to the Rehab Sector/Group

### 2. Crew members are triage to this sector because of their entry evaluations indicate a potential risk:

Two SCBA tanks consecutively, or  
 40 minutes intense work without SCBA.



# Cyanide Poisoning

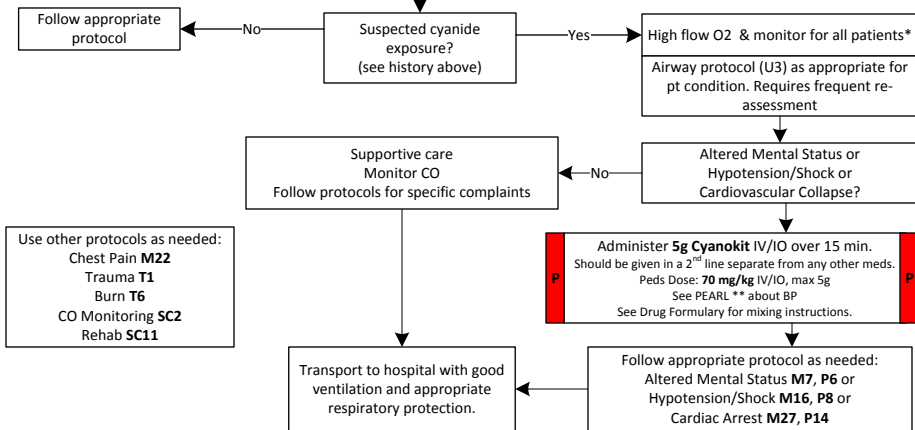
SC12

Cyanokit is kept available for EMS use but not necessarily on the ambulances.

<p><b>History:</b>                  PMH/Medications/Allergies                  Duration &amp; Concentration of Exposure                  Type of exposure: inhalation, ingestion or dermal                  Enclosed or open space exposure                  Presence of fire, smoke or distinctive odors                  Smoke inhalation -presence of soot around mouth, nares, oropharynx                  Ingestion of cyanide                  Eating large amounts of fruit pits                  Industrial exposure</p>	<p><b>Mild/Early Signs &amp; Symptoms:</b>                  Tachypnea/Hyperpnea                  Hypertension                  Nausea/Vomiting/Cramping                  Headache                  Chest Tightness/Pain                  Soot around mouth or nose                  Flu-like symptoms (malaise/fatigue)                  Dizziness                  Reddened skin                  Syncope                  Mydriasis</p>	<p><b>Serious/Late Signs &amp; Symptoms:</b>                  Altered Mental Status (confusion/coma)                  Seizures                  Cardiovascular collapse                  Bradypnea/Apnea                  Hypotension                  Dyspnea</p>	<p><b>Differential:</b>                  Medical vs. Trauma                  Anything that can cause AMS                  AMI/Cardiac                  Co-ingestion/exposure                  Suicidal/behavioral</p>
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**Universal Patient Care Protocol U2**

Focus on scene safety. Responders must protect themselves from secondary contamination due to offgassing and body fluids.



- Pearls:**
- Assess scene for safety. Do not allow yourself to become a victim and do not attempt any rescue that you have not been trained in and do not have the proper safety equipment for.
  - Consider CO & CN poisoning with any product of combustion.
  - High flow O2 regardless of pulse oximeter reading.
  - Elevation in BP >180mmHg systolic or >110mmHg diastolic may occur but generally return to baseline after infusion finished but can last up to 4 hours so use caution in those with BP already >180/100.
  - Cyanokit is not compatible with most meds therefore strongly recommend separate IV or IO access.
  - Pregnancy – use only in cardiovascular collapse or when potential benefit may outweigh risk to fetus. (it may cause fetal harm. No safety & efficacy studies have been performed on humans.)
  - Do not administer if known allergy or angio edema from cyanokit or hydroxocobalamin (B12).
  - Panic symptoms including tachypnea & vomiting may mimic early cyanide poisoning signs.
  - Poison control can be contacted at 1-800-222-1222
  - Common side effects: increased BP, rash, nausea, HA, infusion site reactions, chromaturia, erythema (red coloring of skin)

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# Appendix

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To ensure consistency in patient care reporting, the following is a list of F-M Ambulance approved abbreviations.

**-A-**

<b>À</b>	Before	<b>A&amp;Ox4</b>	Alert & oriented to (PPT & Event)
<b>AAA</b>	Abdominal aortic aneurysm	<b>ABC</b>	Airway, breathing, circulation
<b>Abd</b>	Abdomen	<b>ABG</b>	Arterial blood gas
<b>a.c.</b>	Before meals	<b>ACE</b>	Angiotensin-converting enzyme
<b>ACS</b>	Acute Coronary Syndrome	<b>a.d.</b>	Right ear (auris dexter)
<b>ADD</b>	Attention deficit disorder	<b>AED</b>	Automated external defibrillator
<b>Af</b>	Atrial flutter	<b>A Fib</b>	Atrial fibrillation
<b>AICD</b>	Automatic Implantable Cardioverter Defibrillator	<b>AIDS</b>	Acquired immunodeficiency syndrome
<b>ALS</b>	Advanced Life Support	<b>AIVR</b>	Accelerated Idioventricular rhythm
<b>Ant</b>	Anterior	<b>AMI</b>	Acute myocardial infarction
<b>APGAR</b>	Appearance, Pulse, Grimace, Activity, Respiratory effort	<b>APAP</b>	Acetaminophen (APAP)
<b>ARDS</b>	Adult respiratory distress syndrome	<b>AS</b>	Left ear (auris sinistra)
<b>ASA</b>	Acetyl salicylic acid (Aspirin)	<b>AVM</b>	Arteriovenous malformation
<b>AV</b>	Atrioventricular		

**-B-**

<b>BBB</b>	Bundle branch block	<b>b.i.d.</b>	Twice a day
<b>BGL</b>	Blood glucose level	<b>BM</b>	Bowel movement
<b>BLS</b>	Basic life support	<b>BSA</b>	Body surface area
<b>BP</b>	Blood Pressure	<b>BVM</b>	Bag valve mask

**-C-**

<b>C</b>	With	<b>C°</b>	Centigrade
<b>C/C</b>	Chief complaint	<b>c/o</b>	Complains / complaining of
<b>CA</b>	Carcinoma, cancer	<b>Ca++</b>	Calcium
<b>CABG</b>	Coronary artery bypass graft	<b>CAD</b>	Coronary artery disease
<b>CAT/CT</b>	Computerized axial tomography scanner	<b>CBC</b>	Complete blood count
<b>Cc</b>	Cubic centimeter	<b>CCB</b>	Calcium channel blocker
<b>CCU</b>	Coronary / critical care unit	<b>CHF</b>	Congestive heart failure

<b>Cm</b>	Centimeter	<b>CHI</b>	Closed head injury
<b>CK-MB</b>	Creatine kinase myocardial band	<b>CK</b>	Creatine kinase
<b>CMS</b>	Circulatory, motor & sensory function	<b>Cl</b>	Chlorine
<b>COPD</b>	Chronic obstructive pulmonary disease	<b>CNS</b>	Central nervous system
<b>CO2</b>	Carbon dioxide	<b>CO</b>	Cardiac output / carbon monoxide
<b>CPAP</b>	Continuous positive airway pressure	<b>CP</b>	Chest pain
<b>CRT</b>	Capillary refill time	<b>CPR</b>	Cardiopulmonary resuscitation
<b>C-spine</b>	Cervical spine	<b>CSF</b>	Cerebrospinal fluid
<b>CVA</b>	Cerebrovascular accident	<b>CVP</b>	Central venous pressure
<b>Cx</b>	Chest	<b>CXR</b>	Chest x-ray

## -D-

<b>DCAP BTLS</b>	Deformities, Contusions, Abrasions, Penetrations, Paradoxical movements, Burns, Tenderness, Lacerations, Swelling	<b>dL</b>	Deciliter (1/10 liter: 100 mL)
<b>D&amp;C</b>	Dilation & Curettage	<b>DNR</b>	Do Not Resuscitate
<b>DKA</b>	Diabetic ketoacidosis	<b>DPT</b>	Diphtheria, pertussis, tetanus
<b>DM</b>	Diabetes mellitus	<b>DT's</b>	Delirium tremens
<b>DOB</b>	Date of birth	<b>D10W</b>	Dextrose 10% in water
<b>D5W</b>	Dextrose 5% in water	<b>DVT</b>	Deep vein thrombosis
<b>D25W</b>	Dextrose 25% in water	<b>D50</b>	50% Dextrose
<b>Dx</b>	Diagnosis		

## -E-

<b>ECG/EKG</b>	Electrocardiogram	<b>EDC</b>	Estimated date of confinement
<b>EEG</b>	Electroencephalogram	<b>EF</b>	Ejection fraction
<b>e.g.</b>	For example	<b>Epi</b>	Epinephrine
<b>ER/ED</b>	Emergency room/department	<b>ESRD</b>	End stage renal disease
<b>Est.</b>	Estimated	<b>ET</b>	Endotracheal
<b>ETA</b>	Estimated time of arrival	<b>ETOH</b>	Ethyl alcohol, alcoholic beverage
<b>ETC02</b>	End-tidal carbon dioxide	<b>ETT</b>	Endotracheal tube
<b>EXT</b>	Extremity(s)		

## -F-

<b>F</b>	Female	<b>F°</b>	Fahrenheit
<b>FBAO</b>	Foreign body airway obstruction	<b>FHx</b>	Family history
<b>FHR</b>	Fetal heart rate	<b>Fx</b>	Fracture
<b>FS</b>	Facesheet		

## -G-

<b>G (+ #)</b>	Gravida (G3, G4 etc.)	<b>GCS</b>	Glasgow coma scale/score
<b>GERD</b>	Gastroesophageal reflux disease	<b>GI</b>	Gastrointestinal
<b>Gm, g</b>	Gram	<b>Gtts</b>	Drops
<b>GU</b>	Genitourinary	<b>GYN</b>	Gynecology

## -H-

<b>h, hr</b>	Hour	<b>H/A</b>	Headache
<b>HCTZ</b>	Hydrochlorothiazide	<b>HEENT</b>	Head, eyes, ears, nose, throat
<b>Hg</b>	Mercury	<b>HIV</b>	Human immunodeficiency virus
<b>HR</b>	Heart rate	<b>HRT</b>	Hormone replacement therapy
<b>hs</b>	At bedtime	<b>HTN</b>	Hypertension
<b>Hx</b>	History		

## -I-

<b>ICD</b>	Implanted cardioverter defibrillator	<b>ICP</b>	Intracranial pressure
<b>ICU</b>	Intensive care unit	<b>IDDM</b>	Insulin dependent diabetes mellitus
<b>IM</b>	Intramuscular	<b>Inf</b>	Inferior
<b>IO</b>	Intraosseous	<b>IU</b>	International units
<b>IVP</b>	IV push	<b>IV</b>	Intravenous

## -J-

<b>J</b>	Joules	<b>JVD</b>	Jugular venous distention
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## -K-

<b>K+</b>	Potassium	<b>KED</b>	Kendrick extrication device
<b>Kg</b>	Kilogram		

## -L-

<b>L</b>	Left or Liter	<b>L&amp;D</b>	Labor & Delivery
<b>L/S</b>	Lung Sounds		
<b>Lac</b>	Laceration	<b>LAD</b>	Left axis deviation / left anterior descending
		<b>LBBB</b>	Left bundle branch block
<b>Lbs</b>	Pounds	<b>LLQ</b>	Lower left quadrant
<b>Liq</b>	Liquid	<b>LMA</b>	Laryngeal Mask Airway
<b>LMP</b>	Last menstrual period	<b>LOC</b>	Level/loss of consciousness
<b>Lpm</b>	Liter per minute	<b>LR</b>	Lactated Ringer's
<b>LSB</b>	Long spine board	<b>LSD</b>	Lysergic acid diethylamide
<b>LUQ</b>	Left upper quadrant	<b>LVAD</b>	Left Ventricular Assist Device
<b>L VH</b>	Left ventricular hypertrophy		

## -M-

<b>m</b>	Meter	<b>M</b>	Male
<b>mA</b>	Milliamperes	<b>mg</b>	Milligram
<b>MAP</b>	Mean arterial pressure	<b>MCL</b>	Midclavicular line, Medial Collateral Ligament
<b>mcg</b>	Microgram	<b>MDI</b>	Metered dose inhaler
<b>mEq</b>	Milliequivalent	<b>mL</b>	Milliliter
<b>mm</b>	Millimeter	<b>MMR</b>	Measles, mumps, rubella
<b>MOI</b>	Mechanism of injury	<b>Mph</b>	Miles per hour
<b>MS</b>	Morphine Sulfate, Multiple Sclerosis	<b>MVA</b>	Motor vehicle accident
<b>MVP</b>	Mitral valve prolapse		

## -N-

<b>Na+</b>	Sodium	<b>N/C</b>	Nasal cannula
<b>NG</b>	Nasogastric	<b>NH</b>	Nursing home
<b>NICU</b>	Neurological, neonatal intensive care unit	<b>NIDDM/DM II</b>	Non insulin dependent diabetes mellitus (Type II)
<b>NKA</b>	No known allergies	<b>NKDA</b>	No known drug allergies
<b>NP</b>	Nurse Practitioner	<b>NPA</b>	Nasopharyngeal airway
<b>NPO</b>	Nothing by mouth	<b>NRB</b>	Non-rebreather mask
<b>NS</b>	Normal saline	<b>NSAID</b>	Non-steroidal anti-inflammatory drug
<b>NT</b>	Nasotracheal	<b>NTG</b>	Nitroglycerin
<b>NV/D</b>	Nausea, vomiting, diarrhea		

<b>O2</b>	Oxygen	<b>OB</b>	Obstetrics
<b>OD</b>	Overdose, right eye (oculus dexter)	<b>OPA</b>	Oropharyngeal airway
<b>OPQRST</b>	Pain Assessment: onset, provocation, quality, radiation, severity, time	<b>OR</b>	Operating room
<b>OS</b>	Left eye (oculus sinister)	<b>oz.</b>	Ounce
<b>Ø</b>	No or none		

## -P-

<b>p</b>	After	<b>p.c.</b>	After meals
<b>P (+ #)</b>	Parity (P3, P4 etc)	<b>PA</b>	Physician assistant, pulmonary artery
<b>PCA</b>	Patient Controlled Analgesia	<b>PCI</b>	Percutaneous coronary intervention
<b>PCP</b>	Phencyclidine, Primary Care Physician	<b>PCR</b>	Patient care report
<b>PE</b>	Physical exam, pulmonary emboli, pulmonary edema	<b>pCO2</b>	Carbon dioxide pressure
<b>PEEP</b>	Positive end expiratory pressure	<b>PEA</b>	Pulseless electrical activity
<b>PICU</b>	Pediatric intensive care unit	<b>PERRL</b>	Pupils equal round reactive to light
<b>PMD</b>	Primary/Private medical doctor	<b>PID</b>	Pelvic inflammatory disease
<b>PO</b>	By mouth	<b>P02</b>	Partial pressure of oxygen
<b>post.</b>	Posterior	<b>POC</b>	Position of comfort
<b>p.r.</b>	Per rectum	<b>POV</b>	Privately operated/owned vehicle
<b>PRN</b>	As needed	<b>PRBC's</b>	Packed red blood cells
<b>Pt.</b>	Patient	<b>PSVT</b>	Paroxysmal supraventricular tachycardia
<b>PTS</b>	Pediatric trauma score	<b>PTA</b>	Prior to arrival
<b>PVT</b>	Polymorphic ventricular tachycardia	<b>PVC</b>	Premature ventricular contraction
		<b>P/W/D</b>	Pink warm and dry

## -Q-

<b>Q</b>	Every	<b>Qh</b>	Every hour
<b>q.i.d.</b>	Four times a day		

## -R-

<b>R</b>	Right	<b>RAD</b>	Right axis deviation, reactive airway
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<b>RBBB</b>	Right bundle branch block	<b>Rbc</b>	Red blood cell, red blood (cell) count
<b>RCA</b>	Right coronary artery	<b>RHD</b>	Rheumatic heart disease
<b>RLQ</b>	Right lower quadrant	<b>ROSC</b>	Return of spontaneous circulation
<b>ROM</b>	Range of motion	<b>RN</b>	Registered nurse
<b>RR</b>	Respiratory rate	<b>RSV</b>	Respiratory syncytial virus
<b>RTS</b>	Revised trauma score	<b>RUQ</b>	Right upper quadrant
<b>Rx</b>	Prescription		

**-S-**

<b>§</b>	Without	<b>s/s</b>	Signs / symptoms
<b>SAO2</b>	Oxygen saturation of arterial oxyhemoglobin	<b>SARS</b>	Severe acute respiratory syndrome
<b>SBP</b>	Systolic blood pressure	<b>SC, SQ</b>	Subcutaneous
<b>SIDS</b>	Sudden infant death syndrome	<b>SL</b>	Sublingual, Saline Lock
<b>SOB</b>	Shortness of breath	<b>St</b>	States
<b>STD</b>	Sexually transmitted disease	<b>SUV</b>	Sport utility vehicle
<b>SVT</b>	Supraventricular tachycardia	<b>Sx</b>	Symptoms

**-T-**

<b>T spine</b>	Thoracic spine	<b>TBI</b>	Traumatic brain injury
<b>Temp</b>	Temperature	<b>tab</b>	Tablet
<b>TB</b>	Tuberculosis	<b>Tbsp</b>	Tablespoon
<b>TCP</b>	Transcutaneous pacing	<b>TCA</b>	Tricyclic antidepressant
<b>t.i.d.</b>	Three times a day	<b>TIA</b>	Transient ischemic attack
<b>TKO</b>	To keep open	<b>Tsp</b>	Teaspoon
<b>Tx</b>	Treatment		

**-U-**

<b>u</b>	Unit	<b>U/A</b>	Upon arrival, urine analysis
<b>URI</b>	Upper respiratory infection	<b>UTI</b>	Urinary tract infection

**-V-**

<b>VD</b>	Venereal disease	<b>Vol</b>	Volume
<b>VF</b>	Ventricular fibrillation	<b>VS</b>	Vital signs

<b>VT</b>	Ventricular tachycardia	<b>Vt</b>	Tidal volume
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**-W-**

<b>w/</b>	With	<b>w/o</b>	Without, wide open
<b>WPW</b>	Wolf-Parkinson-White	<b>WNL</b>	Within normal limits

**-X-**

<b>X-fer</b>	Transfer
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**-Y-**

<b>y/o</b>	Years old
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**-Symbols-**

<b>@</b>	At	<b>?</b>	Questionable, possible
<b>&amp;</b>	And	<b>x</b>	Times
<b>-</b>	Negative	<b>+</b>	Positive
<b>#</b>	Number	<b>=</b>	Equal
<b>&lt;</b>	<u>Less than</u>	<b>&gt;</b>	<u>Greater than</u>

The GCS is scored between 3 and 15, 3 being the worst, and 15 the best. It is composed of three parameters : Best Eye Response, Best Verbal Response, Best Motor Response, as given below :

## Best Eye Response. (4)

1. No eye opening.
2. Eye opening to pain.
3. Eye opening to verbal command.
4. Eyes open spontaneously.

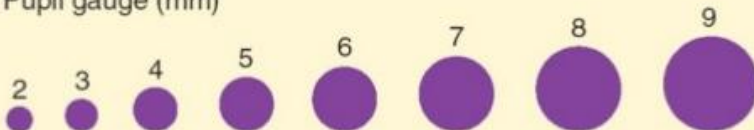
## Best Verbal Response. (5)

1. No verbal response
2. Incomprehensible sounds.
3. Inappropriate words.
4. Confused
5. Orientated

## Best Motor Response. (6)

1. No motor response.
2. Extension to pain.
3. Flexion to pain.
4. Withdrawal from pain.
5. Localizing pain.
6. Obeys Commands.

Pupil gauge (mm)





## Wong-Baker FACES® Pain Rating Scale



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**Pearls:**

- Explain to the person that each face is for a person who has no pain (hurt) or some, or a lot of pain.
- Face 0 doesn't hurt at all. Face 2 hurts just a little bit. Face 4 hurts a little bit more. Face 6 hurts even more. Face 8 hurts a whole lot. Face 10 hurts as much as you can imagine, although you don't have to be crying to have this worst pain.
- Ask the person to choose the face that best depicts the pain they are experiencing

**VOMIT Pt Hand-off Report**

**V = Vital Signs: highest heart rate & lowest BP**

(looking for signs of shock, compensation)

**O = Origin, where is pt coming from**

(home, highway vs. in-town, nursing home)

**M = Mechanism of Injury/Illness**

(paint picture of scene, specifically comment if listed in **T2**)

(Medical: what are events leading up to illness)

**I = Injuries identified**



(include areas you are suspicious for injury based on MOI)

(Medical: identified signs & symptoms)

**T = Treatments given**

(pt improvement or outcome post treatment)

Interpretation: if any of these 3 signs is abnormal, the probability of a stroke is 72%

	<p><b>Facial Droop</b>  <i>The patient shows teeth or smile</i></p> <ul style="list-style-type: none"> <li>• Normal – both sides of the face move equally</li> <li>• <b>Abnormal – one side of the face does not move as well as the other side</b></li> </ul> 
<p><b>Arm Drift</b>  <i>The patient closes eyes and extends both arms straight out, with palms up for 10 seconds</i></p> <ul style="list-style-type: none"> <li>• Normal – both arms move the same or both arms do not move at all (other findings, such as pronator drift, may be helpful)</li> <li>• <b>Abnormal – one arm does not move or one arm drifts downward</b></li> </ul>	<p><b>Abnormal Speech</b>  <i>The patient repeats “you can’t teach an old dog new tricks”</i></p> <ul style="list-style-type: none"> <li>• Normal – patient uses correct words with no slurring</li> <li>• <b>Abnormal – patient slurs words, uses the wrong words, or is unable to speak</b></li> </ul>

**Things to Remember:**

- Signs and symptoms of a stroke are not limited to the Cincinnati stroke scale but may also include sudden onset of: numbness or weakness of face, arm or leg, confusion, trouble speaking, comprehension, vision trouble, trouble walking, dizziness, loss of balance or coordination, severe headache with no known cause.
- It is important to rule out seizure activity with onset of symptoms.
- When stroke symptoms are identified, establish an onset time. If onset was not witnessed then establish when the patient was last seen normal.

Contraindications for tPA	Yes	No
History of brain tumor, aneurysm or intracranial hemorrhage	Yes	No
Major head trauma or major CVA within 3 months		No
Major surgery or serious trauma within 14 days	Yes	No

Any "yes" makes patient ineligible for tPA. Transport normally.

If all "no's", proceed to relative contraindications

Relative contraindications for tPA	Yes	No
Improving neuro symptoms or mild stroke symptoms	Yes	No
Initial blood glucose under 50 or over 400	Yes	No
Seizure with onset of stroke signs & symptoms	Yes	No
Recent MI or current signs and symptoms of a MI	Yes	No
GI or urinary tract hemorrhage within 21 days	Yes	No
Pregnancy	Yes	No

**M** If pt has a relative contraindication, consult medical control about requesting stroke alert **M**

If all "no's", request a stroke alert & consider rapid transport

**Things to Remember:**

- If pt is >80 years old & exceeds a 3 hour onset, they may not be a tPA candidate. Discuss with medical control.
- As a general guideline, IV tPA should be given within 3 hours and intra-arterial tPA within 4.5 hours. However, there are many variables in stroke treatment with advancements in IA tPA time frames and interventional options so EMS should focus on a good history taking and assessment including symptom onset and communicate that well to the receiving hospital early.

	Sign	0 Points	1 Point	2 Points
<b>A</b>	<b>Appearance</b> (skin color)	Blue-grey, pale all over	Pink, except for extremities	Pink over entire body
<b>P</b>	<b>Pulse</b>	Absent	Less than 100	More than 100
<b>G</b>	<b>Grimace</b> (reflex irritability)	No response to stimuli	Grimace in response to stimuli	Sneezes, coughs, pulls away
<b>A</b>	<b>Activity</b> (muscle tone)	Absent, flaccid	Arms and legs flexed	Active movement
<b>R</b>	<b>Respirations</b>	Absent	Slow, irregular	Good, crying

<p>1 Minute</p> <p>A = _____</p> <p>P = _____</p> <p>G = _____</p> <p>A = _____</p> <p>R = _____</p>	<p>10 = Infant in best possible condition</p> <p>7 – 9 = Infant is slightly depressed but near normal</p> <p>4 – 6 = Infant is moderately depressed</p> <p>0 – 3 = Infant is severely depressed</p>	<p>5 Minutes</p> <p>A = _____</p> <p>P = _____</p> <p>G = _____</p> <p>A = _____</p> <p>R = _____</p>
<p><b>1 Minute Total =</b></p> <p>_____</p>		<p><b>5 Minute Total =</b></p> <p>_____</p>

Medication	Typical Concentration	Typical Starting Dose	How to Titrate	Max Rate	Effects	What to Watch For
Nitroglycerin	100mg/250ml	5 mcg/min	5-10 mcg/min every 3-5 min	200 mcg/min	Decrease in BP Decrease in CP	Keep BP within range specified by MD
Phenylephrine (Neo-Synephrine) Indication: Neurogenic hypotension	50mg/250ml	0.1-0.2 mcg/kg/min	By tenths mcg/kg/min	6 mcg/kg/min	Increase in BP	Watch MAP Can titrate by 1 mcg/kg/min but is a significant jump
Propofol	1000mg/100ml	Adults: 20 mcg/kg/min	5-10 mcg/kg/min every 3-5 min prn	80 mcg/kg/min	Sedation Decrease in MAP & HR	Watch for hypotension. Change tubing every 6-12 hrs or every 3rd bottle.
Vasopressin	Varies	Per MD order	Not a drug for titration - follow MD order	2 unit/min	Increase in BP	Can be used for GI bleed just prior to OR
Levophed (norepinephrine)	4mg/250ml	0.5-1 mcg/min	0.5-1 mcg every 3-5 min to reach goal BP or MAP of 65	30 mcg/min	Increase in BP	watch MAP & BP closely, bradycardia & arrhythmias
Cardizem (Diltiazem)	125mg/125ml (25ml med mixed in 100ml D5W)	5-20 mg/hr *usually start at 10 mg/hr	Titrate 5 mg/hr every 10 min	20 mg/hr	Decrease in HR, possible rhythm conversion	Hypotension, bradycardia if not titrated carefully

### Things to Remember:

- This chart is for reference only. It is not intended as a standing order or protocol.
- Information listed is the most common setup that Sanford Pharmacy uses. Every concentration and dosage must be double checked prior to administration.
- If in doubt start pressors at 5-10 ml/hr.
- Program the drug into the pump, double check your concentration on the bag with the pump information.
- Make sure the patient is adequately hydrated with fluid.
- Pressors won't work if the patient is volume depleted – fill the tank.
- MAP (mean arterial pressure) is considered to be the perfusion pressure seen by organs in the body. A MAP of approx 60 is necessary to perfuse coronary arteries, brain and kidneys. Usual range 65-110.
- MAP =  $(2 \times \text{diastolic}) + \text{systolic}$  Also indicated on the Lifepak in parenthesis in the BP field.

**Always attempt to:**

- Contact LVAD Implant Center
- Keep patient's family member with the patient (will be knowledgeable about the equipment)
- Bring LVAD equipment with you
- Notify receiving facility early that pt has LVAD

**Patient Problem**

- Volume related (bleeding/infection)
- Arrhythmia
- Heart failure
- Non-cardiac related emergency

**Patient Stable (signs of good perfusion: alert, oriented, good skin color/temp)**

- Contact LVAD Center
- Treat per recommendations of LVAD center or
- Treat per protocol that addresses pt's primary complaint

**Patient Unstable (signs of poor perfusion: altered mental status, cyanosis, cool skin, unresponsive)**

- Treat per protocol that addresses pt's primary complaint
- Consider fluid bolus
- Administer medications or electrical therapy as indicated
- Contact LVAD Center and treat per recommendations as time permits
- CPR as needed

**CPR**

- Listen for device by auscultation. If a "whooshing" sound is present then pump is running & CPR shouldn't be needed.
- Device recommendations:
- CPR can be performed on: Heartmate II, Heartware, Jarvik
  - No CPR for Heartmate XVE or PVAD/IVAD

**Pump Problem**

- Battery/power
- Controller related
- Internal device related

**Battery/Power**

- Replace battery
- Attach to wall outlet
- Do NOT restart unless instructed to do so by LVAD center

**Controller Related**

- Switch to spare controller

**Internal Device Related**

- Support circulation

**Things to Remember:**

- Patient may or may not have a palpable pulse normally.
- Blood pressure is normally audible by doppler only.
- Most patient wear a medical alert tag showing the LVAD center contact information. Information can also be listed on the controller around their waist.
- Controller alarm colors are the same as triage colors (red: emergent, yellow: urgent, green: time to take action).
- Be VERY careful with scissors as there are lots of wires and tubing.
- Mayo Clinic LVAD Coordinator Emergency cell phone 507-951-0007
- University of Minnesota, Fairview LVAD Coordinator 612-273-3000, pager 0700

Use the following maintenance drip calculation for pediatric patients to maintain current BP/perfusion after fluid bolus or to prevent fluid overload when pt requires IV access but not fluid.

### How to Calculate Maintenance Rate for the Normal Saline

4ml/kg/hr for first 0-10kg  
+  
2ml/kg/hr for next 10-20kg  
+  
1ml/kg/hr for next 20kg

### Example for 35kg pt:

4 x 10 (1<sup>st</sup> 10kgs)  
+  
2 x 10 (for 2<sup>nd</sup> 10kgs)  
+  
1 x 15 (for remaining kgs)  
=75 ml/hr

	5kg	10kg	15kg	20kg	25kg	30kg	35kg
Maintenance Drip (ml/hr)	20	40	50	60	65	70	75
Hyperglycemia NS Infusion (ml/hr)	30	60	75	90	98	105	113

Chart is calculated as ml/hr. When using microdrip tubing gtt/s /min is the same as ml/hr.

The Hyperglycemia NS infusion calculation is to be used when pediatric patients have blood sugar >300mg/dL and s/s of dehydration. This infusion is 1.5 times the maintenance drip.

## Drug Calculations

This is meant as a quick reference only. Use the method that is consistent and makes sense to you.

Simple Infusion Formula:

$$\frac{\text{Volume to be infused x gtt/s (tubing size)}}{\text{Time of infusion}}$$

Simple Infusion Example:

$$\frac{100 \text{ ml} \times 60 \text{ gtt/s}}{60 \text{ min}} = 100 \text{ gtt/s/min}$$

Weight Dependent Formula:

$$\frac{\text{Dose} \times \text{Weight in kg} \times \text{gtt/s (tubing size)}}{\text{Concentration on hand} \times \text{Time in min}} = \text{gtt/s/min}$$

(to find concentration on hand: take mg in vial / ml in vial)

Weight Dependent Example (dopamine):

$$\frac{10 \text{ mcg} \times 100 \text{ kg} \times 60 \text{ gtt/s}}{1600 \times 1 \text{ min}} = 37.5 \text{ gtt/s/min}$$

Non Weight Dependent Formula:

$$\frac{\text{Dose} \times \text{gtt/s (tubing size)}}{\text{Concentration on hand} \times \text{Time in min}} = \text{gtt/s/min}$$

(to find concentration on hand: take mg in vial / ml in vial)

Non Weight Dependent Example (amiodarone):

$$\frac{150 \text{ mg} \times 60 \text{ gtt/s}}{3.6 \times 10 \text{ min}} = 250 \text{ gtt/s/min}$$

Todd's Formula:

$$\frac{\text{Want (dose)} \times \text{Vehicle (liquid or ml in vial)}}{\text{Have (mg in vial)}} = \text{ml}$$

Todd's Formula Example (versed):

$$\frac{1 \text{ mg} \times 1 \text{ ml}}{5 \text{ mg}} = 0.2 \text{ ml}$$

	10 – 100 Kg (22 – 220 Lbs)	5 (11)	10 (22)	20 (44)	30 (66)	40 (88)	50 (110)	60 (132)	*70 (154)	*80 (176)	*90 (198)	*100 (220)
	ETT	3-4	4	5	6	6-7	7+	7+	7+	7+	7+	7+
Peds or Brady?	Atropine (mg) Children 0.02mg/kg	0.1	0.2	0.4	0.6	0.8	1	1	1	1	1	1
ICP?	Fentanyl (mcg) 3mcg/kg	15	30	60	90	120	150	180	210	240	270	300
		This dose may be used with versed or ketamine for post-intubation sedation.										
Sedate DO NOT PARALYZE WITHOUT SEDATION	ETOMIDATE (mg) 0.3mg/kg	1.5	3	6	9	12	15	18	*21	*24	*27	*30
		Can cause decrease in BP. Use ½ dose if systolic BP < 100. *Can use 20mg dose for 70-120 kg.										
	KETAMINE (mg) 2.0 mg/kg	10	20	40	60	80	100	120	140	160	180	200
		Use caution with ICP/Cardiac. In hypersalivation, administer 0.3 mg Atropine.										
	MIDAZOLAM (mg) 0.05(peds) 0.1(adult)mg/kg	0.25	0.5	1	1.5	2	2.5	3	4	5	6	7
		Can cause decrease in BP. Use ½ dose if systolic BP < 100.										
	Maintenance (0.05mg/kg) →	0.25	0.5	1	1.5	2	2.5	3	4	5	6	7
		7 Peds Dosing @ 0.05mg/kg/7 7 Adult Dosing @ 0.1mg/kg 7										
Paralyze (Rapid, short term)	Succinylcholine(mg) 2mg/kg	10	20	40	60	80	100	120	*140	*160	*180	*200
		Short acting. Do not use in old crush or burns, hx of malignant hyperthermia, hyperkalemia. *Can use 200mg dose for 70-120 kg.										
Paralyze (Slow, long term)	Rocuronium (mg) 1mg/kg	5	10	20	30	40	50	60	70	80	90	100
		Long acting. If needed, second dose is 0.1-0.2mg/kg.										
	Maintenance (0.2mg/kg) →	1	2	4	6	8	10	12	14	16	18	20
	Vecuronium (mg) 0.1mg/kg	0.5	1	2	3	4	5	6	7	8	9	10
		Long acting. If needed, second dose is 0.01-0.05 mg/kg.										
	Maintenance (0.05mg/kg) →	0.25	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5

	110 – 200 Kg (242 – 440 Lbs)	*110 (242)	*120 (264)	130 (286)	140 (308)	150 (330)	160 (352)	170 (374)	180 (396)	190 (418)	200 (440)	
	ETT	7+	7+	7+	7+	7+	7+	7+	7+	7+	7+	
Peds or Brady?	Atropine (mg) Adults 0.5mg – 1.0mg	1	1	1	1	1	1	1	1	1	1	
ICP?	Fentanyl (mcg) 3mcg/kg	330	360	390	420	450	480	510	540	570	600	
		This dose may be used with versed or ketamine for post-intubation sedation.										
Sedate DO NOT PARALYZE WITHOUT SEDATION	ETOMIDATE (mg) 0.3mg/kg	*33	*36	39	42	45	48	51	54	57	60	
		Can cause decrease in BP. Use ½ dose if systolic BP < 100. *Can use 20mg dose for 70-120 kg.										
	KETAMINE (mg) 2.0 mg/kg	220	240	260	280	300	320	340	360	380	400	
		Use caution with ICP/Cardiac. In hypersalivation, administer 0.3 mg Atropine.										
	MIDAZOLAM (mg) 0.1(adult)mg/kg	11	12	13	14	15	16	17	18	19	20	
		Can cause decrease in BP. Use ½ dose if systolic BP < 100.										
	Maintenance (0.05mg/kg) →	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	
		7 Adult Dosing @ 0.1mg/kg 7										
Paralyze (Rapid, short term)	Succinylcholine(mg) 2mg/kg	*220	*240	260	280	300	320	340	360	380	400	
		Short acting. Do not use in old crush or burns, hx of malignant hyperthermia, hyperkalemia. *Can use 200mg dose for 70-120 kg.										
Paralyze (Slow, long term)	Rocuronium (mg) 1mg/kg	110	120	130	140	150	160	170	180	190	200	
		Long acting. If needed, second dose is 0.1-0.2mg/kg.										
	Maintenance (0.2mg/kg) →	22	24	26	28	30	32	34	36	38	40	
	Vecuronium (mg) 0.1mg/kg	11	12	13	14	15	16	17	18	19	20	
		Long acting. If needed, second dose is 0.01-0.05 mg/kg.										
	Maintenance (0.05mg/kg) →	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	



## **Drug Formulary**

Listed in alphabetical order

\*Not every drug will be carried in every service. When equivalent drugs are available, a service may choose to carry only one based on local medical control preference. i.e. cardiazem vs. metoprolol, versed vs. ativan

## Activated Charcoal

This drug is only carried in ND services.

Class.....	Gastrointestinal toxicity
Action.....	Absorbent, acts by binding toxic substances, thereby inhibiting their GI adsorption
Pharmacokinetics.....	No systemic absorption, half-life unknown
Contraindications .....	Cyanide poisoning, mineral acids, caustic alkalis, organic solvents, iron, ethanol, and methanol
Precaution.....	<u>Many, see protocol M12</u>
Adverse effects .....	Vomiting, abdominal cramping, abdominal bloating, and constipation.
Indications.....	Treat acute ingested poisons and drugs
Route .....	Oral, NG/OG
Per Clinical Procedure.....	M-12

Trade Name.....	Adenocard
Class.....	Antidysrhythmic
Action.....	Slows AV node conduction, interrupts reentry pathways. Adenosine works in a variety of receptors grouped into a group called P1 receptors. The true mechanism is somewhat unclear. Adenosine works through the activation of cAMP and coupled G-proteins to cause its cardiac effects.
Pharmacokinetics.....	Onset: Immediate, Peak: Immediate, Duration: half-life 10 seconds.
Contraindications .....	Known hypersensitivity. Sick Sinus Syndrome. Second or third degree AV block. Use with caution in patients with severe asthma.
Adverse effects .....	Flushing, CP, HA, N/V, hypotension
Indications.....	Symptomatic (poor perfusion) narrow complex tachycardia w/ pulse
Route .....	IV/IO, very fast push
Per Protocols.....	M-25, P-12, P-13

Trade Name.....Proventil, Ventolin

Class.....Sympathomimetic Bronchodilator

Action.....Beta2 adrenergic. Smooth muscle relaxant. Minimal Beta1 effects. Reduces mucous secretion and edema via histamine inhibition.

Pharmacokinetics.....Onset 5-15m, peak 1-1.5h, duration 3-6h, half-life 3h.  
Nebulized with >6 lpm O2  
May be administered down ETT

Contraindications .....Known hypersensitivity.

Adverse effects .....Tachycardia, palpitations, peripheral vasodilation, tremors, HA, sore throat, dry mouth, PVCs, N/V.

Indications.....Wheezing due to bronchospasm

Route .....Nebulized

Per Protocols.....M-3, M-6, P-3, P-5, P-21, T-8

Trade Name.....	Cordarone
Class.....	Antidysrhythmic
Action.....	Prolongs the duration of the action potential and refractory period of all Cardiac fibers. Depresses the Phase 0 slope by causing a sodium blockade. Causes a Beta block as well as a weak calcium channel blockade. Therefore it decreases the SA nodes rate of firing, suppresses automaticity, interrupts reentrant pathways and prolongs PR, QRS and QT intervals. Relaxes vascular smooth muscle, decreases peripheral vascular resistance, and increases coronary contractility.
Pharmacokinetics.....	Onset: Rapid, Duration: Serum concentrations drop 10% within 30-45 minutes.
Contraindications .....	Cardiogenic shock, bradycardia, second/third degree block, known cocaine overdose
Adverse effects .....	Vasodilation (usually not associated with decreased cardiac output secondary to the negative inotropic effects), hypotension, bradycardia, AV block, increased QT interval, V-Tach, tremors, pulmonary toxicity
Indications.....	Ventricular Arrhythmias or Wide Complex Tachycardia with or without a pulse
Route .....	IV/IO
Per Protocols.....	M-26, M-28, M-30, P-13, P-15
Mixing.....	Mix 900mg Amiodarone in 250ml D5W. Must use 0.2 micron filter w/tubing. To administer 150mg IV over 10 minutes run mixture at 250 ml/hr for 10 minutes. For maintenance infusion of 1 mg/min run mixture at 16 ml/hr.

Class.....	Analgesic, Antipyretic, NSAID, platelet inhibitor
Action.....	Inhibits the formation of prostaglandins associated with pain, fever, and inflammation. Inhibits platelet aggregation by acetylating cyclooxygenase permanently disabling it so that it cannot synthesize prostaglandins and Thromboxanes. Since Thromboxane A2 is important in clotting its absence does not allow blood to clot effectively.
Pharmacokinetics.....	Onset: 5-30 minutes, Peak: 15 minutes-2 hours, Duration: 1-4 hours.
Contraindications .....	Allergy, internal bleeding, possibility of pregnancy
Precaution.....	Patients with known ASA or NSAID-sensitive Asthma
Adverse effects .....	N/V, diarrhea, heartburn, GI bleeding
Indications.....	Suspected cardiac ischemia
Route .....	oral
Per Protocol.....	M-22

Class.....	Parasympatholytic
Action.....	Competitive antagonist that selectively blocks all muscarinic responses to Ach. Blocks vagal impulses, thereby increasing SA node discharge, thereby enhancing AV conduction and cardiac output. Potent anti-secretory effects caused by the blocking of acetylcholine at the muscarinic site. Atropine is also useful in the treatment of the symptoms associated with nerve agent poisoning.
Pharmacokinetics.....	Rapid onset, peak in 2-4m IV, half-life 2-3h.
Contraindications .....	A-Fib, A-Flutter, tachycardia, glaucoma, acute hemorrhage. Use with caution in suspected AMI.
Adverse effects .....	Pupil dilation, tachycardia, V-Tach, V-Fib, HA, dry mouth, blurred vision, dry eyes, dilated pupils
Indications.....	Symptomatic Bradycardia, beta-blocker or calcium channel blocker overdose, excessive vagal stimulation during RSI and Organophosphate poisoning
Route .....	IV/IO
Per Protocols.....	M-5, M-23, P-4, P-11

# Calcium Chloride

Class.....	Calcium Disorders, minerals
Action.....	Electrolyte modifier, essential for the transmission of nerve impulses in cardiac muscle contraction
Pharmacokinetics.....	Onset: 5-15 min, Duration: depends on dose, may be present 4 hours after IV administration
Contraindications .....	Not to be used during resuscitation unless hyperkalemia, hypocalcemia, or calcium channel blocker toxicity is probable
Precaution.....	Rapid administration of calcium in a beating heart may produce slowing of cardiac rate; pts taking digitalis may have increased ventricular irritability and calcium may produce digitalis toxicity; in presence of sodium bicarbonate, it will precipitate calcium salts or carbonates; don't give without physician order
Adverse effects .....	Syncope, arrhythmias, bradycardia, and cardiac arrest, tissue necrosis at injection site
Indications.....	Symptomatic hyperkalemia, hypocalcemia (esp. for hydrofluoric acid and fluorine gas exposure), calcium channel blocker overdose or toxicity including; Verapmil (Calan, Isoptin), Diltiazem (Cardizem), Nifedipine (Procardia, Adalat), Nicardipine (Cardene, Vasonase), Nimodipine (Nimotop), Amlodipine, Felodipine, Flunarizine, Bepridil, Isradipine, Nisoldapine, Nitrendapine; respiratory depression following administration of Magnesium Sulfate
Route .....	IV
Per Protocols.....	M-23, M-26, M-28, M-29, P-11, P-15, P-16



Trade Name.....	Glucose, D50, D10
Class.....	Carbohydrate. Dextrose (aka. glucose) is one of the basic building blocks of all sugars. Glucose is a monomer and is therefore readily processed in the blood. Insulin turns excess glucose into glycogen when blood sugars are high. Glucose is a large molecule that forms a ring, this structure is incapable of being absorbed into a cell without a mediator (insulin) and therefore increases damage to epithelium as it floats through the blood stream. It also causes an osmotic pressure as concentrations vary across membranes. The pressure is less with D10 and D25 therefore they are used in pediatrics.
Action.....	Principal form of glucose used by the body
Pharmacokinetics.....	Rapid absorption in bloodstream, readily absorbed via the digestive tract
Contraindications.....	Use with caution in patients with suspected increased ICP.  Oral administration is contraindicated in unconscious pts or pts unable to control their airway or <2years of age.
Adverse effects.....	Patients may complain of warmth, pain, or burning at the injection site. Extravasation causes necrosis. Oral administration can cause airway compromise.
Indications.....	Suspected or known hypoglycemia
Route.....	Oral, IV/IO
Per Protocols.....	M-7, M-28, M-29, P-6, P-15, P-16, SC5

# Diltiazem

Services should pick between diltiazem or metoprolol based on local medical control and carry only one.

Trade Name.....Cardizem

Class .....Calcium Channel Blocker

Action .....A slow calcium channel blocker that inhibits calcium ion influx through slow channels into cells of myocardial and arterial smooth muscle (both coronary and peripheral blood vessels). As a result, intracellular calcium remains at sub-threshold levels insufficient to stimulate cell excitation and contraction. Diltiazem slows SA and AV node conduction (antidysrhythmic effect) without affecting normal atrial action potential or intraventricular conduction. Inhibits the influx of calcium ions during membrane depolarization of cardiac and vascular smooth muscle. The therapeutic benefits are related to its ability to slow AV nodal conduction time and prolong AV nodal refractoriness. Diltiazem slows ventricular rates, interrupts the reentry circuit in AV nodal re-entrant tachycardias and reciprocating tachycardias. It also prolongs the sinus cycle length and decreases peripheral vascular resistance.

Pharmacokinetics ..... Onset: 3 minutes, Peak: 7 minutes, Duration: half-life 2-4 hours

Contraindications .....2nd & 3rd degree heart block, bradycardia, hypotension (systolic BP < 100mmHg), Acute MI, cardiogenic shock, Wide complex tachycardia, WPW syndrome, Sick Sinus Syndrome, IV Beta Blocker use (regular PO use is acceptable)

Adverse effects .....Hypotension, bradycardia, heart block, chest pain, asystole, nausea, vomiting, headache, fatigue, drowsiness, itching or burning at injection site.

Indications.....Uncontrolled atrial fibrillation or atrial flutter with a rapid ventricular response exhibiting signs and symptoms related to the rate.

Dosing .....IV/IO, must be given slow over at least 2 minutes.

Per Protocols.....M-24, M-25

Special Note.....Must be refrigerated. Only stable for 24 hours at room temp.

# Diphenhydramine

Trade Name.....	Benadryl, Benylin
Class.....	Antihistamine, Ethanolamine, Anticholinergic
Action.....	Diphenhydramine blocks the effects of Histamine (H1 histamine) on the H1 receptor site through a competitive competition for the peripheral H1 site. When diphenhydramine is bound the H1 site cannot be stimulated preventing the effects of histamines (swelling, etc...). As an H1 blocker diphenhydramine blocks the effects of H1 on its receptor in the cortex as well this causes a change in the cortex neural potassium channels causing neurons in the cortex to have a higher threshold to depolarize. This results in an increase in sedation as a result of the H1 block. As an antihistamine, diphenhydramine one of the most effective antihistamines.
Pharmacokinetics.....	Onset: 15 minutes IV, Peak: 1-4 hours, Duration: half-life 2-10 hours.
Contraindications .....	Known allergy, acute asthma attack
Adverse effects .....	Sedation, dizziness, HA, blurred vision, palpitations, wheezing, hypotension, hallucinations, and paradoxical excitement (especially in children).
Indications.....	Hives/Rash or Adult dystonic reaction, allergic reaction
Route .....	IV, IO, IM
Per Protocols.....	M-6, M-11, M-12, P-5

Trade Name.....	Intropin
Class.....	Sympathomimetic, Catecholamine
Action.....	Naturally occurring hormone and precursor to Norepinephrine. This catecholamine has different effects at different doses due to the sensitivity of receptors at different sites being related to the concentration of dopamine present. At low doses (2-5 mcg/kg/min) Dopamine increases the perfusion of the mesenteric arteries and the kidneys. Low doses can be used to try and perfuse an ischemic bowel or a failing kidney. Has a direct action on alpha and beta-adrenergic receptors. As doses are increased (5-10 mcg/kg/min), beta receptors are stimulated increasing force of contraction as well as heart rate and conduction. As dopamine becomes more concentrated (10-20 mcg/kg/min) the less sensitive peripheral alpha receptors become activated this causes a increase in vascular constriction that increases as the drug becomes more concentrated until at 20 mcg/kg/min the effects are mainly on the peripheral vasculature.
Pharmacokinetics.....	Onset < 5 minutes, Duration: half-life 10 minutes
Contraindications .....	Pheochromocytoma (adrenal tumors), tachydysrhythmias, HTN, hypotension due to hypovolemia
Adverse effects .....	Tachydysrhythmias, VF, VT, AMI, N/V, HA, dyspnea, tissue necrosis at IV site.
Indications.....	Hypotension unresponsive to fluid therapy
Route .....	IV/IO
Per Protocols.....	M-16, M-23, M-30, P-8, P-18, T-1

Mixing.....Mix at a 1600 mcg/ml concentration. Mix 400 mg in 250 ml D5W. Use 60 gtts tubing or tubing with a flow regulator. When using a flow regulator, the gtts/min in the chart will be the same as ml/hr on dial.

Patient Weight	5 mcg/kg/min	10 mcg/kg/min	15 mcg/kg/min	20 mcg/kg/min
50 kg	9 gtts/min	18 gtts/min	28 gtts/min	38 gtts/min
60 kg	11 gtts/min	22 gtts/min	34 gtts/min	45 gtts/min
70 kg	13 gtts/min	26 gtts/min	39 gtts/min	53 gtts/min
80 kg	15 gtts/min	30 gtts/min	45 gtts/min	60 gtts/min
90 kg	18 gtts/min	34 gtts/min	51 gtts/min	68 gtts/min
100 kg	19 gtts/min	37 gtts/min	56 gtts/min	75 gtts/min
110 kg	21 gtts/min	41 gtts/min	62 gtts/min	83 gtts/min
120 kg	23 gtts/min	45 gtts/min	68 gtts/min	90 gtts/min

Trade Name.....	Vasotec
Class.....	ACE Inhibitor
Action.....	Enalaprilat is the injectable form of the medication enalapril. Enalaprilat's action is that of blocking Angiotension-converting enzyme (ACE). This enzyme produces a chemical agent that narrows blood vessels and causes a rise in blood pressure, thus this medication's action is relaxation of blood vessels, helps lower blood pressure and reduces afterload (primary desired effect).
Pharmacokinetics.....	Onset: 15 minutes, Peak 5-60 min, Duration 4 hours.
Contraindications .....	Pregnant patients, history of angioedema Use with caution in dialysis patients as may cause adverse hypotension
Adverse effects .....	hypotension, fatigue, dizziness, non-productive cough, orthostatic effects, muscle cramping, blurred vision, taste alteration, tinnitus, HA, chest pain, irregular heartbeat, angioedema, tingling in hands and feet.
Indications.....	Congestive heart failure, pulmonary edema
Route .....	IV, IO over 5 minutes
Per Protocols.....	M-4

Trade Name.....	Adrenaline
Class.....	Sympathomimetic
Action.....	Naturally occurring catecholamine obtained from animal adrenal glands. Acts on alpha and beta adrenergic receptors. The most potent alpha agonist. Beta1: Strengthens myocardial contraction, increase sys BP (may decrease dia BP), increases HR and cardiac output. Beta2: Dilates bronchial smooth muscle and inhibits mucous secretion. Alpha: Constricts bronchiole arterioles, inhibits histamine release, constricts arterioles in the skin, mucous membranes, and kidneys but dilates those in the skeletal muscle. Action is through a natural hormonal mechanism.
Pharmacokinetics.....	Onset: <2m IV, 3-10m IM, Peak 5m IV, 20m IM, Duration 5-10m IV, 20-30m IM.
Contraindications .....	Tachydysrhythmias, coronary artery disease.
Adverse effects .....	HA, N/V, tachydysrhythmias, AMI, diaphoresis, anxiety, palpitations.
Indications.....	Allergic Reaction/Anaphylaxis, Reactive Airway Disease, Pediatric Bradycardia, Cardiac Resuscitation
Route .....	IV, IO, IM
Per Protocols.....	M-3, M-6, M-28, M-29, P-3, P-5, P-11, P-15, P-16

Trade name.....	Amidate
Class.....	Anesthetics, General
Action.....	Short acting sedative/hypnotic without amnesiac effects
Pharmacokinetics.....	Exact mechanism of actions unknown; may have GABA-like effects, depresses brain stem reticular formation activity and produces hypnosis; onset 30-60sec, peak 1min, duration 3-5 min
Contraindications .....	Known hypersensitivity to Etomidate
Precaution.....	Be prepared to prevent aspiration and protect patient's airway. Intubation should follow shortly after administration of medication. Etomidate provides no amnesiac qualities so fentanyl should be given for patient comfort before administration
Adverse effects .....	Tonic-clonic skeletal muscle contractions can occur; the pre-administration of fentanyl should correct the issue. Apnea, laryngospasm, hypertension/hypotension, tachycardia/bradycardia
Indications.....	Induction for RSI
Protocol Dosing.....	IV/IO
Per Protocol.....	M-5, P-4



Trade Name.....	Sublimaze
Class.....	Narcotic analgesic
Action.....	The principal actions of therapeutic value are analgesia and sedation.
Pharmacokinetics.....	Opioid (narcotic, CNS-acting) analgesics are derivatives of opium. These drugs modify the perception of pain and provide a sense of euphoria by binding to specific opiate receptors throughout the central nervous system. Many of the characteristics of particular opioids relate to the receptor to which they bind. Fentanyl is classified as full agonists and binds to mu receptor sites, blocks pain impulses, and produces maximum pain control. Onset: immediate, Peak 3-5 minutes, Duration 30-60 minutes.
Contraindications .....	Fentanyl is not indicated for MAOI use, asthma, myasthenia gravis, and evidence of hypoperfusion.
Adverse effects .....	Fentanyl may cause muscle rigidity, particularly involving the muscles of respiration. In addition, skeletal muscle movements of various groups in the extremities, neck and external eye have been reported during induction of anesthesia with fentanyl; these reported movements have, on rare occasions, been strong enough to pose patient management problems. This effect is related to the dose and speed of injection and its incidence can be reduced by slower administration and lower doses titrated to effect. As with other narcotic analgesics, the most common serious adverse reactions reported to occur with fentanyl are respiratory depression, apnea, rigidity, and bradycardia; if these remain untreated, respiratory arrest, circulatory depression or cardiac arrest could occur. Other adverse reactions that have been reported are hypertension, hypotension, dizziness, blurred vision, nausea, emesis, laryngospasm, and diaphoresis.
Indications.....	Acute pain management
Route .....	IN, IV, IO, IM
Per Protocol.....	M-5, M-22, M-31, P-4, SC6, T-6, U-8

Class.....	Hormone, Antihypoglycemic
Action.....	Causes a breakdown of stored blood glycogen to glucose and inhibits glycogen synthesis. Glucagons acts by binding to glucagon receptor sites and stimulating a secondary messenger through the increase of adenylate cyclase. Beta stimulation causes an increase in the adenylate cyclase. Therefore glucagon has been known to have beta like effects just as Beta drugs such as Epinephrine are known to stimulate Glycogenolysis in the liver. Increases circulating blood sugar.
Pharmacokinetics.....	Onset 5-20minutes, Peak: 30 minutes, Duration: 1-1.5 hours. Half-life 30 minutes. Can be given intranasal if dose doubled.
Contraindications.....	Not efficacious in poorly nourished individuals as they have no glycogen stores. Allergy or known hypersensitivity.
Adverse effects.....	N/V, HA
Indications.....	Hypoglycemia < 40 if unable to obtain IV access for D50
Route.....	IM, IN dose doubled
Per Protocols.....	M-7, M-23, M-28, M-29, P-6, P-11, P-15, P-16

Trade Name.....Too numerous to list (520 at the time of this printing).

Class.....Anticoagulant

Action.....Heparin sodium, a glycosaminoglycan, inhibits the mechanisms that induce the clotting of blood and the formation of stable fibrin clots at various sites in the normal coagulation system. When heparin sodium is combined with antithrombin III (heparin cofactor), thrombosis is blocked through inactivation of activated Factor X and inhibition of prothrombin's conversion to thrombin. This also prevents fibrin formation from fibrinogen during active thrombosis.

Pharmacokinetics.....Onset: IV – immediate, SQ – 20-30 minutes.

Contraindications.....Active bleeding, uncontrolled (except when due to DIC); instances in which blood coagulation tests cannot be performed at necessary intervals (full-dose heparin only); pregnant or nursing women (do not administer product preserved with benzyl alcohol); thrombocytopenia (severe).

Precautions.....**1)** medication errors resulting in fatal hemorrhage have occurred; heparin sodium injection vial should not be confused with or used as "catheter lock flush" product; carefully examine and confirm correct vial choice before administering **2)** benzyl alcohol is contained in some heparin sodium products; consider total daily benzyl alcohol load, especially if other medications containing the preservative are coadministered; serious adverse events and death have been associated with benzyl alcohol use, particularly in pediatric patients **3)** age greater than 60 years; increased risk of bleeding, primarily in women **4)** bacterial endocarditis, subacute; increased risk of hemorrhage **5)** bleeding disorders, congenital or acquired (ie, hemophilia, thrombocytopenia, and some vascular purpuras); increased risk of hemorrhage **6)** gastrointestinal ulceration; increased risk of hemorrhage **7)** heparin resistance has been frequently reported in fever, thrombosis, thrombophlebitis, infections with thrombosing tendencies, myocardial infarction, cancer, and following surgery **8)** hepatic disease with impaired hemostasis; increased risk of hemorrhage

**9)** hypersensitivity to heparin; administer only in clearly life-threatening situations **10)** hypertension, severe; increased risk of hemorrhage **11)** menstruation; increased risk of hemorrhage **12)** surgery, major (especially involving brain, spinal cord, or eye) and/or spinal tap or spinal anesthesia; increased risk of hemorrhage during and immediately following procedure **13)** thrombocytopenia has occurred; monitoring recommended; discontinuation of therapy may be necessary **14)** tube drainage of stomach or small intestine, continuous; increased risk of hemorrhage

Adverse effects.....hypotension, vasospasm, ecchymosis, eczema, erythema, erythroderma, injection site pain, purpura, system inflammatory response syndrome, tissue necrosis, , hyperkalemia, DIC, hematoma, hemorrhage, heparin-induced thrombocytopenia, increased platelet aggregation, thrombocytopenia, hepatotoxicity, cerebral hemorrhage, epidural hematoma, non-traumatic spinal subdural hematoma, ventricular hemorrhage, bronchospasm, hemopneumothorax, pulmonary edema, general adverse reaction, drug action decreased, fever, withdrawal signs/symptoms

Indications.....Acute STEMI

Route.....IV

Per Protocol.....M-22

# Hydroxocobalamin

This drug is kept available for EMS use but not necessarily on the ambulances.

Trade Name.....	Cyanokit
Class .....	Vitamin, antidote
Action .....	Binds with cyanide to form cyanocobalamin which that can be excreted in the urine.
Pharmacokinetics .....	Reduces whole blood cyanide concentrations by approx. 50% by the end of the 15 minute infusion. Half-life: 26-31 hours.
Contraindications .....	None
Cautions.....	Known anaphylaxis or angioedema to hydroxocobalamin (B12) or Cyanocobalamin.
Adverse effects .....	May cause elevation in BP >180mmHg systolic or >110mmHg diastolic but generally returns to baseline after infusion is finished. It can last up to 4 hours so use caution in those w/BP already >180/100.
Side Effects.....	Erythema (red coloring of skin), rash, nausea, HA, infusion site Reactions, chromaturia (red colored urine can last up to 35 days)
Pregnancy.....	Should be used during pregnancy only if the potential benefit Justifies the potential risk to the fetus. No safety & efficacy studies have been performed on humans.
Indications.....	Cyanide Poisoning
Route.....	IV, IO Should be used in a separate line as it is not combatable with most medications.
Per Protocols.....	SC12
Mixing Instructions.....	To reconstitute place the vial in an upright position. Add 200ml of 0.9% Sodium Chloride (normal saline) to the vial using the Fill to the line. (D5W can also be used if Sodium Chloride is not readily available.)

The vial should be repeatedly inverted or rocked, not shaken, for at least 60 seconds prior to infusion.

Use vented intravenous tubing, hang and infuse over 15 minutes.

Cyanokit solution should be visually inspected for particulate matter and color prior to administration. Discard solution if particulate matter is present or solution is **not** dark red.

Trade Name.....Atrovent

Class .....Parasympatholytic Bronchodilator

Action .....Anticholinergic agent, chemically closely related to atropine and has the same actions as Atropine. Acts directly on the smooth muscle and decreases secretions. Reduces the vagally mediated reflex bronchospasm caused by inhaled irritants.

Pharmacokinetics .....10% of inhaled dose reaches lower airway, 0.5% reaches systemic distribution. Peak: 1.5-2 hours, Duration: 4-6 hours, half-life 1.5-2 hours.

Contraindications .....Narrow-angle Glaucoma, Hypersensitivity to Atropine or allergy to soy products,

Adverse effects .....Dry mouth, HA, cough, dries secretions

Indications.....Obstructive Airway Disease, Reactive Airway Disease

Route.....Nebulized

Per Protocols.....M-3, P-3, P-5, P-21, T-8

Trade Name.....Ketalar

Class .....Sedative, Analgesic

Action ..... A phencyclidine derivative that acts as a dissociative anesthetic. It produces profound sedation and uncouples cortical pain perception. Releases endogenous catecholamine (epi, norepi) which maintains blood pressure and heart rate, dilates bronchial smooth muscles and stimulates beta receptors in the lungs.

Pharmacokinetics ..... Onset: 30 seconds IV, 3-4 minutes IM, Duration: 5-10 min IV, 12-25 mg IM. Half-life 2.5-3 hours.

Contraindications .....Hypersensitivity to the drug, **PT experiencing STEMI or CHF.**

Adverse effects .....Hypertension, tachycardia, hypotension, bradycardia, arrhythmia, increased ICP, emergence reaction (vivid imagery, hallucinations, delirium, confusion, excitement, and irrational behavior), nausea/vomiting, hypersalivation, respiratory stimulation, respiratory depression, apnea, laryngospasm.

Indications.....Induction of anesthesia for RSI procedures, for pain control as an adjunct to narcotic medication, for sedation of the intubated patient with a systolic BP <100, control of the aggressive excited delirium or severe agitation patient with an imminent safety threat is posed to providers, bystanders or patients.

Dosing .....IV/IM, given over 60 seconds IV.

Per Protocols.....M-5, M-11, M-13, U-8, U-3, P-4

Special Note.....Must be stored at 60-86° and protected from light. If an emergence reaction is recognized, administer midazolam.

Administration.....Must be diluted for IV administration and give slowly over 1 min. Easiest dilution for the 500mg/5ml concentration is to mix 1ml with 9ml of saline. This will give you 10mg/ml.

Class .....	Antidysrhythmic, Sodium channel blocker
Action.....	Raises the threshold for ventricular contractions and lowers the threshold for defibrillation and cardioversion. Suppresses automaticity in the His-Purkinje system and by elevating the electrical stimulation threshold of ventricular contractions. This is accomplished by blocking the rapid influx of Na <sup>+</sup> during the initial phase of depolarization. Typically shortens the action potential and the refractory period secondary to a blockade of sodium channels that usually (in procainamide's blockade) continue to function normally through phase 2 of the action potential. Lidocaine functions well in hyperkalemic and acidotic states therefore it works well on ischemic tissues.
Pharmacokinetics .....	Onset 3m, peak 5-7m, duration 10-20m, ½ life 1.5-2h.
Contraindications .....	CHF, shock, use caution in the elderly, second or third degree heart block, allergy or known hypersensitivity.
Adverse effects .....	Seizures, slurred speech, AMS, anxiety, drowsiness, confusion, respiratory/cardiac arrest, hypotension, bradycardia, arrhythmias.
Indications.....	Pain Management for IO Infusion.
Route.....	IO
Per Protocols.....	CP13



Trade Name.....	Ativan
Class.....	Benzodiazepines
Action.....	Binds to benzodiazepine receptors; enhances GABA effects
Pharmacokinetics.....	Unknown, liver; onset- 5 min, half-life - 12-14hrs
Contraindications .....	Respiratory compromise, allergy, neonates
Precaution.....	Pulmonary impairment, sleep apnea, CNS depression, alcohol use, avoid abrupt withdrawal, renal impairment, hepatic impairment, elderly or debilitated patients
Adverse effects .....	Respiratory failure, resp depression, apnea, respiratory failure, syncope, suicidality, tachycardia, hypotension, jaundice, CNS stimulation, paradoxical
Indications.....	Seizures, behavioral emergencies, alcohol withdrawal
Route .....	IV/IO/IN
Per Protocol.....	M-8, M-11, M-12, M-13, P-7, SC6

Class .....	Electrolyte
Action .....	Molecularly Mg <sup>+</sup> is very similar to Ca as it has the same electron valence. Because of this it chemically very similarly to Ca <sup>+</sup> and in some reactions in the body. Ca <sup>+</sup> is significantly larger than Mg <sup>+</sup> therefore Mg <sup>+</sup> does not adequately replace it in cases that are not purely chemical. Because of these qualities Mg <sup>+</sup> can prevent Ca <sup>+</sup> from binding to Troponin and prevent muscles from contracting as described in the action for "Calcium Gluconate". Because of its extremely positive charge it also blocks neuromuscular transmission by changing the electric potentials threshold.
Pharmacokinetics .....	Onset immediate, duration 30m
Contraindications .....	Renal disease, AV block, previous myocardial damage, shock, hypocalcemia, hypermagnesemia.
Adverse effects .....	Hypotension, asystole, cardiac arrest, respiratory/CNS depression, flushing, sweating, dizziness, drowsiness, altered level of consciousness.
Indications.....	Obstetrical Emergencies/ Seizures (adult only), Reactive Airway Disease, Toxic Exposure (Hydrofluoric Acid), Pulseless Arrest, Tachycardia w/ pulse (adults only).
Route.....	IV/IO
Per Protocol.....	M-3, M-21, M-26, M-28, P-3

When the protocols call for an infusion over time: Dilute the Magnesium Sulfate dose into either 500ml of NS or 250ml of D5W (depending on what is more appropriate for the patient) and infuse over the time indicated per protocol.

-In the case of fluid overload do not dilute the Magnesium Sulfate and give slowly (over at least 5 minutes)

# Methylprednisolone

Trade Name.....	Solu-Medrol
Class.....	Glucocorticosteroid
Action.....	Adrenal Corticosteroid with fewer sodium and water retention effects than hydrocortisone. Methylprednisolone alters the body's immune response. Swelling is reduced because it prevents the white blood cells traveling to the area.
Pharmacokinetics.....	Half-life of 2.5-3.5h.
Contraindications.....	None for anaphylaxis. Caution in patients with CHF, seizure disorder, diabetes, hypertension, tuberculosis, or impaired liver function.
Adverse effects.....	Peptic ulcer, hyperglycemia, hypokalemia, impaired ability to fight infection, adrenal insufficiency, steroid psychosis, CHF, anaphylaxis, in the prolonged use the side effects are so numerous they are the subject of several books.
Indications.....	Allergic Reaction/Anaphylaxis, Reactive Airway Disease, COPD
Dosing.....	IV
Per Protocols.....	M-3, M-6, P-3, P-5

# Metoprolol

Services should pick between diltiazem or metoprolol based on local medical control and carry only one.

Trade Name.....Lopressor

Class .....Beta-adrenergic antagonist

Action .....Negative inotropic and chronotropic responses are demonstrated by slowing of AV nodal conduction and decreased heart rate. Decreased myocardial oxygen consumption, antiarrhythmic effect, suppression of renin release and inhibition of central nervous system outflow is observed

Pharmacokinetics ..... Onset: 5-10 minutes, Peak: 20 minutes, Duration: half-life 3-7 hours

Contraindications .....2nd & 3rd degree heart block, heart rate < 45 beats per minute, hypotension (systolic BP < 100mmHg), moderate to severe cardiac failure

Adverse effects .....Hypotension, CHF, bronchospasm, bradycardia, dizziness, chest pain, and headache

Indications.....Rate control for uncontrolled atrial fibrillation or atrial flutter. Use with adult patients exhibiting signs and symptoms and a rapid ventricular response over 100bpm.

Dosing .....IV/IO

Per Protocols.....M-24, M-25

Trade Name.....Versed

Class.....Sedative, Benzodiazepine

Action.....As a Benzodiazepine this drug functions on GABA similarly to the action of "Diazepam". Midazolam is a short-acting muscle-relaxant, anticonvulsant, in addition to these effects Midazolam also has anterograde amnesic effects, it is therefore preferred prior to cardioversion.

Pharmacokinetics.....Onset 3-5m IV, 6-14 IN, peak 20-60, duration < 2h, ½ life 1-4h.

Contraindications.....Acute narrow angle glaucoma, coma

Adverse effects.....Resp. depression, hypotension, bradycardia, HA, N/V

Indications.....Seizures, Violent Patient/Chemical Sedation, Sedation for Electrical therapy, Hyperthermia (Environmental) and Induced Hypothermia, RSI, Dizziness/Vertigo.

Route.....IV/IN/IM/IO

Per Protocols.....M-5, M-8, M-12, M-23, M-24, M-25, M-26, M-31, M-32, P-4, P-7, P-12, P-13, SC5, SC6, U-8

Trade Name..... Narcan

Class..... Narcotic Antagonist

Action..... Competitive antagonist for opioids competing for opiate receptor sites in the brain. Displaces narcotic molecules from opiate receptors through this competition. Higher doses are needed to overcome overdoses of opiates that have a higher affinity for the opiate receptor in the brain.

Pharmacokinetics..... Onset <2 minutes, Peak <2 minutes, duration 2-20 minutes, half-life 60-90 minutes.

Contraindications..... Neonates with narcotic-addicted mothers.

Adverse effects..... Withdrawal symptoms, hypotension, hypertension.

Indications..... Narcotic overdose, as a diagnostic tool in coma of unknown origin.

Route..... IV/IM/IO/IN (IN is considered the safer route)

Per Protocols..... M-7, P-6

# Nitroglycerin

Class.....	Nitrate
Action.....	Potent vasodilator with antianginal, anti-ischemic, and antihypertensive effects. Relaxes vascular smooth muscle by an unknown mechanism. Decreases peripheral vascular resistance, preload, and afterload.
Pharmacokinetics.....	Onset 1-3m SL, 30m transdermal. Peak 5-10m SL. Duration is 20-30m SL, 3-6h transdermal.
Contraindications.....	Hypotension, hypovolemia, severe bradycardia or tachycardia, use of erectile dysfunction drugs within past 24hrs up to 48 hours depending on use of extended release medications, head trauma.
Adverse effects.....	Hypotension, HA, syncope, tachycardia, dizziness, weakness.
Indications.....	Chest Pain, CHF/Pulmonary Edema, Hypertension (only on physician order)
Route.....	SL
Per Protocols.....	M-4, M-22

Trade Name.....	Zyprexa
Class.....	Antipsychotics
Action.....	Antagonize dopamine type 2 and serotonin receptors in the CNS, also has anticholinergic, anti-histaminic, and anti-alpha 1 adrenergic effects
Pharmacokinetics.....	Onset: 15 minutes, half-life 30 hours
Contraindications .....	Known hypersensitivity to Zyprexa
Precaution.....	Elderly pts with a history of Alzheimer's disease and or dementia (increases the risk of sudden death, heart failure, and stroke/TIA), history of attempted suicide, pregnancy (unknown effect to fetus), hx of seizures (can increase risk for seizures), alcoholism (could decrease resp effort), neuroleptic malignant syndrome (life threatening neurological disorder that can cause a fever, AMS, diaphoresis, rigid muscles, and and autonomic imbalance)
Adverse effects .....	orthostatic hypotension, hypertension, seizures, and hyperglycemia
Indications.....	Psychotic disorders: Schizophrenia and Bipolar 1 Mania, combative behavior requiring chemical sedation, prolonged agitation with no response to de-escalation technique
Route .....	IM
.....	Olanzapine must be diluted in 2ml of Sterile Water NOT normal saline. Must only be given IM, not IV.
Per Protocol.....	M-11, M-13



- Trade Name.....Zofran
- Class.....Antiemetic, 5-HT<sub>3</sub> receptor antagonist
- Action.....Ondansetron is a selective 5-HT<sub>3</sub> receptor antagonist. While its mechanism of action has not been fully characterized, Ondansetron is not a dopamine-receptor antagonist. Serotonin receptors of the 5-HT<sub>3</sub> type are present both peripherally on vagal nerve terminals and centrally in the chemoreceptor trigger zone of the area postrema. It is not certain whether Ondansetron antiemetic action is mediated centrally, peripherally, or in both sites. The released serotonin may stimulate the vagal afferents through the 5-HT<sub>3</sub> receptors and initiate the vomiting reflex.
- Pharmacokinetics.....Rapid onset, half-life 3-4 hours
- Contraindications.....If the patient is sensitive to or has ever had an allergic reaction to Ondansetron hydrochloride, do not give Zofran. If drugs similar to Zofran (for instance, Anzemet or Kytril) have caused a reaction, Zofran may cause one too. If your patient has phenylketonuria (an excess of the amino acid phenylalanine) Zofran also contains this substance. Known long QT syndrome.
- Precautions.....Pregnancy as there is unknown effects to fetus
- Adverse effects.....Blurred vision or temporary blindness, fever, slow heart rate, trouble breathing, anxiety, agitation, shivering, feeling light-headed or fainting, hypotension, EKG alterations (2nd degree AVB, PVC's, Atrial Fibrillation), pain or burning at injection site, angina, extrapyramidal reactions.
- Indications.....Nausea and/or Vomiting
- Route.....IV, IO, IN, IM
- Per Protocols.....M-12, M-17, M-32, P-9, SC6, SC7, U-8

Class.....Inhalation gas

Action.....Increases arterial oxygen tension (SaO<sub>2</sub>) and hemoglobin saturation

Pharmacokinetics.....Immediate onset of action

Contraindications.....None in the prehospital setting.

Adverse effects.....Nonhumidified oxygen can dry mucous membranes, but humidified O<sub>2</sub> is not indicated in the prehospital setting.

Indications.....Smoke, carbon monoxide, or toxic gas inhalation, trauma or suspected blood loss, hypoxia (SaO<sub>2</sub> < 95%) from any cause, respiratory distress, poor capillary refill or other indications of poor oxygenation, unresponsive patients, obstetric patients with known or suspected complications.

Dosing.....NRB, NC, Blow-by, ETT, BVM

Per Protocols.....M-5, M-6, M-22, SC2, U-3

Trade Name.....Zemuron

Class.....Nondepolarizing neuromuscular blocker

Action.....Binds competitively to cholinergic receptors on motor end-plate to antagonize action of acetylcholine, resulting in block of neuromuscular transmission.

Pharmacokinetics.....Onset: 1-2 minutes, Duration: 31-67 minutes

Contraindications.....Allergy or known hypersensitivity to Rocuronium

Adverse effects.....Anaphylaxis, hypotension, hypertension

Indications.....Muscle relaxation for intubation

Route.....IV/IO

Per Protocols.....M-5, M-31, P-4

# Sodium Bicarbonate

Class.....	Electrolyte
Action.....	Short-acting, potent, systemic antacid. Immediately raises the pH of blood plasma by buffering excess hydrogen ions. This occurs because the Na <sup>+</sup> (sodium) and the HCO <sub>3</sub> <sup>-</sup> (bicarbonate ion) separate in solution. While separate the negative charge on the bicarbonate is able to accept (and will prefer over sodium) hydrogen ions. The HCO <sub>3</sub> <sup>-</sup> then becomes H <sub>2</sub> CO <sub>3</sub> which the body will turn into water and CO <sub>2</sub> . In tricyclic overdoses the Na <sup>+</sup> ion is important also in its use to attempt to overcome the sodium blockade that occurs.
Pharmacokinetics.....	Onset immediate, duration 1-2h.
Contraindications.....	None with indicated use.
Adverse effects.....	Metabolic acidosis, hypokalemia, fluid overload, may cause hypernatremia, hyperosmolality, and hypocalcemia.
Indications.....	Overdose, Hyperkalemic Arrest, Neonatal Resuscitation (OLMC), Burns, Crush Injuries
Route.....	IV/IO
Per Protocols.....	M-12, M-26, M-28, M-29, P-11, P-15, P-16, T-11

# Succinylcholine

Trade Name.....Anectine

Class..... Depolarizing neuromuscular blocker

Action..... As does acetylcholine, it combines with the cholinergic receptors of the motor end plate to produce depolarization. This depolarization may be observed as a fasciculation. Subsequent neuromuscular transmission is inhibited so long as adequate concentration of succinylcholine remains at the receptor site. Onset of flaccid paralysis is rapid (less than 1 minute after IV administration), and with single administration lasts approximately 4 to 6 minutes.

Pharmacokinetics.....Onset: 1 minute, Duration 4-6 minutes.

Contraindications..... Allergy or known hypersensitivity to succinylcholine, personal or family history of malignant hyperthermia, skeletal muscle myopathies, known renal failure or hyperkalemic patient, crush or burn > 72 hours old.

Adverse effects.....Apnea, cardiac arrhythmias (profound bradycardia can occur in children and any patient receiving a second dose of succinylcholine), increased intraocular pressure and increased intracranial pressure, malignant hyperthermia, muscular fasciculation, hyperkalemia.

Indications.....Muscle relaxation for intubation.

Route.....IV/IO

Per Protocols.....M-5, P-4

Class..... Anesthetic

Action..... Used as an ophthalmic anesthetic. Decreases ion permeability by stabilizing neuronal membrane and prevents the initiation and transmission of nerve impulses, thereby effecting local anesthesia.

Pharmacokinetics..... Onset: 25-30 seconds, Duration: 15 minutes.

Contraindications..... Hypersensitivity to para-aminobenzoic acid.

Adverse effects..... Blurred vision, stinging and burning, lacrimation, photophobia, conjunctival redness.

Indications..... Foreign body removal, eye flushing, burns (thermal and chemical)

Route..... Intraocular

Per Protocols..... T-10

# Tranexamic Acid (TXA)

Trade Name:.....Lysteda

Class:.....Anti-fibrinolytic, miscellaneous coagulation modifiers

Action:.....It is an anti-fibrinolytic that inhibits plasminogen activation and plasmin activity, therefore preventing clot breakdown. It does not promote new clot formation or have an effect on platelet count, platelet aggregation or coagulation pathway enzyme activity.

Pharmacokinetics:.....Half-life is approximately 2 hours

Adverse effects:.....Nausea, vomiting, diarrhea, hypotension, visual disturbances, changes in visual color perceptions (which may indicate toxicity), seizures and thrombotic complications

**Exclusion Criteria:.....**

- 1. <18years old;**
- 2. >3 hours from onset of trauma and blood loss;**
- 3. Known thrombotic process: MI,CVA, PE;**
- 4. Pre-existing subarachnoid hemorrhage;**
- 5. A patient who has received factor IX complex concentrates**
- 6. Pregnancy**

**Inclusion Criteria:.....**Patients with known or suspected blood loss from blunt or penetrating trauma should receive TXA if either or both of the following are met:

- 1. SBP< 90 currently or reported/documentd any time since onset of traumatic injury.**
- 2. Patients who are receiving/or have received blood products or 3% saline due to this traumatic injury**

Route/Administration:.....

1. Must have a large bore IV
2. TXA is available in 1gm/10ml vials
3. Dilute TXA with 50ml Normal Saline
4. Infuse TXA bolus of 1gm over 10minutes - **must use IV pump**
5. Maximum rate of 100mg/minutes - **Rapid Infusion can cause hypotension**
6. Monitor for adverse effects and stop infusion if hypotension or visual color change perceptions occur
7. Flush IV thoroughly after administration

Per Protocols:.....T1

Trade Name.....Norcuron

Class..... Non-depolarizing neuromuscular blocker

Action.....The relaxation of skeletal muscles which facilitates endotracheal intubation and mechanical ventilation.

Pharmacokinetics.....Binds to receptors and prevents acetylcholine (Ach) from stimulating receptors. It competes with Ach for nicotinic receptor binding sites. The blockade is competitive, hence muscle paralysis occurs gradually.

Pharmacokinetics.....Onset: 2-3 minute, Duration 37-60 minutes.

Contraindications..... None

Adverse effects..... Prolonged paralysis, apnea, bronchospasm, hypotension, tachyarrhythmia, prolonged muscle weakness, prolonged neuromuscular block (half-life is approximately 65-75 minutes) especially in patients with renal or hepatic insufficiency or geriatric patients.

Indications.....To facilitate invasive cooling procedure, muscle relaxation for intubation.

Route.....IV/IO

Per Protocol.....M-5, M-31, P-4



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