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Preface

The EMS Guidelines contained herein provide medical direction to Cody Regional Health Emergency Medical Service (EMS).

The Cody Regional Health EMS Guidelines are intended to direct all levels of pre-hospital providers affiliated with either CRH-EMS. The Cody Regional Health EMS Guidelines will direct providers as they render care to patients within their respective response areas, on patient transfers both in and out of state, and on mutual aid responses.

The Cody Regional Health EMS Guidelines follow the Wyoming Office of EMS "Scope of Practice."



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Legend

R	EMR	R
B	EMT-Basic	B
A	EMT-Advanced	A
I	EMT-Intermediate	I
P	EMT-Paramedic	P
T	Transmit EKG Data	T
M	Contact Medical Control	M

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Scope of Practice

Skills	Levels					Interpretive Guideline
Supplemental Oxygen Therapy						
a. Oxygen delivery devices	R	B	A	I	P	This includes any type of cannula or mask designed for the delivery of supplemental oxygen.
b. Humidified Oxygen	R	B	A	I	P	
Basic Airway Management						
a: Manual maneuvers to open and control the airway	R	B	A	I	P	Head-tilt-chin-lift; tongue-jaw lift; modified chin lift; jaw thrust; Sellick’s maneuver
b: Manual maneuvers to remove an airway obstruction	R	B	A	I	P	
c: Insertion of airway adjuncts intended to go into the oropharynx (OPA)	R	B	A	I	P	
d: Insertion of airway adjuncts intended to go into the nasopharynx (NPA)	R	B	A	I	P	
Ventilation Management						
a: Mouth to barrier devices	R	B	A	I	P	
b: Bag-Valve-Mask	R	B	A	I	P	
c: Manually triggered ventilators	R	B	A	I	P	
d: Automatic Transport Ventilators			A	I	p	
e: Ventilators					P	Includes the use of PEEP

Scope of Practice

Skills	Levels					Interpretive Guideline
Suctioning						
a: Upper Airway suctioning	R	B	A	I	P	
b: Tracheobronchial suctioning			A	I	P	
Advanced Airway Management						
a: Continuous Positive Airway Pressure (CPAP) administration and management			A*	I	P	* AEMT may only provide CPAP via stand-alone , automatic CPAP device .
b: Bilevel Positive Airway Pressure (BiPAP) administration and management					P	
c: Supraglottic Airway			A	I	P	* AEMT may only insert devices that do not require laryngoscopy
d: Endotracheal intubation					P	* This includes nasal and oral endotracheal intubation at the paramedic level. IEMTs may NOT perform endotracheal intubation per CRH Clinical Guidelines, regardless of state-level endorsement.
e: Airway obstruction removal by direct laryngoscopy				I	P	
f: Percutaneous or Surgical Cricothyrotomy					P	
g: Gastric decompression					P	
h: Pleural decompression via needle thoracotomy				I	P	
i: Chest Tube Monitoring					P	

Scope of Practice

Skills	Levels					Interpretive Guidelines
Assessment Skills						
a: Perform patient assessments	R	B	A	I	P	
b: Obtaining vital signs manually and electronically	R	B	A	I	P	This includes manual measurements and the use of non-invasive blood pressure monitoring devise, pulse oximetry measurement, blood glucose monitoring. *EMR does not monitor BGL
Fundamental Pharmacological Skills						
a. Use of unit-dose , commercially pre-filled containers or auto-injectors for the administration of life saving medications intended for self, peer, or patient rescue after exposure to nerve agents .	R	B	A	I	P	Mark I kits
b. Assist patients in taking their own prescribed medications as approved by Medical Direction		B	A	I	P	Albuterol inhaler; Nitroglycerine tablet, spray, or patch
c. Administration of oral glucose (hypoglycemia) and aspirin (ischemic chest pain) with approval of medical direction.	R*	B	A	I	P	*EMR may not administer oral glucose
Advanced Pharmacological Skills: Venipuncture /Vascular Access						
a. Obtaining Peripheral venous blood specimens			A	I	P	Through direct venipuncture or existing peripheral IV catheter. *EMS will not collect blood for law enforcement screening outside of hospital setting
b. Peripheral IV insertion and maintenance (including removal)			A	I	P	This includes the placement of saline locks. *Peripheral lines include external jugular veins , but does not refer to umbilical catheters *Advanced and Intermediate will follow facility policies for in-hospital vascular access
c. Intraosseous (IO) device insertion (including removal)			A	I	P	
d. Access indwelling catheters and implanted central IV ports for fluid and medication administration					P	This includes PICC and ART Lines
e. Central line monitoring					P	

Scope of Practice

Skills	Levels					Interpretive Guidelines
Advanced Pharmacological Skills: Administration of Medications/Fluids						
a. Crystalloid IV solutions			A	I	P	IV solutions include 5% Dextrose in Water; Lactated Ringers; 0.9% Sodium Chloride Solution
b. Administration of hypertonic dextrose (D50, D25) solutions of hypoglycemia			A	I	P	
c. Administration of glucagon for hypoglycemia.			A	I	P	
d. Administration of sublingual Nitroglycerine to a patient experiencing ischemic chest pain		B	A	I	P	*Basic may administer Nitroglycerine prescribed to the patient <u>and</u> must have verbal orders from medical control.
e. Parenteral administration of epinephrine for anaphylaxis .	R	B*	A*	I	P	*EMR may only administer epinephrine via auto-injector *A/EMT may utilize syringe and needle to administer epinephrine 1:1000 by Intramuscular route.
f. Inhaled (nebulized) medications to patients with difficulty breathing and/or wheezing			A*	I	P	Inhaled (nebulized) refers to atomization of the medication through an oxygen/air delivery device with a medication chamber, or through the use of a metered dose inhaler. *AEMT may administer Albuterol; Atrovent; or Duo-Neb
g. Administration of naloxone (Narcan) to a patient suspected of narcotic overdose	R*	B*	A	I	P	*EMR and EMT-B must use unit-dose auto injector or unit-dose, premeasured commercial nasal spray .
h. Administration of Nitrous Oxide gas (50% NO, 50% O₂) for pain relief.			A	I	P	
i. Paralytic administration					P	
j. All other medications by Paramedics					P	Paramedics may administer any medication if they have been: * Trained to use medication <u>AND</u> * Demonstrated competence in use and side effects <u>AND</u> * State issued legal authority to use or perform <u>AND</u> * Authorization from medical director
k. Maintain an infusion of blood or blood products					P	

Scope of Practice

Skills	Levels					Interpretive Guidelines
Fundamental Cardiac Skills						
a. Manual, external CPR	R	B	A	I	P	*Includes EMR
b. Use of Automated External Defibrillator (AED)	R	B	A	I	P	*Includes EMR
Advanced Cardiac Skills						
a. Use of mechanical CPR assist device	R	B	A	I	P	Ex. LUCAS Device *Includes EMR
b. 4-lead ECG monitoring and interpretation				I	P	
c. 12-lead ECG Monitoring		B*	A*	I	P	* EMT/AEMT may only obtain and transmit
d. 12-lead ECG interpretation				I*	P	* IEMT is not expected to be capable of interpreting and providing interventions for all possible arrhythmias. IEMTs are expected to identify , and provide appropriate interventions for lethal arrhythmias (within their scope of practice)
e. Manual cardiac defibrillation				I*	P	* IEMT will only defibrillate a pulseless and apneic patient
f. Emergency cardioversion , including vagal maneuvers					p	
g. Transcutaneous cardiac pacing					p	
Emergency Childbirth Management						
a. Assist in the delivery of a newborn	R	B	A	I	P	*Includes EMR
Behavioral Emergencies						
a. Manual or mechanical patient restraints	R	B	A	I	P	Includes soft, disposable restraints and leather restraints, as approved by medical director. Requires appropriate patient monitoring. *Includes EMR
b. Chemical restraint of combative patient					p	See “Pharmacological Interventions” sub-section in Scope of Practice section of guidelines.

Scope of Practice

Skills	Levels					Interpretive Guidelines
Trauma Care: Injuries						
a. Manual cervical stabilization and cervical collar use	R	B	A	I	P	
b. Manual stabilization of orthopedic trauma	R	B	A	I	P	
c. Spinal motion restriction	R	B	A	I	P	Includes use of commercial devices (KED®)
d. Splinting	R	B	A	I	P	Includes traction splints
e. Pneumatic, anti-shock garment (PASG) and Medical, anti-shock trousers (MAST)		B	A	I	P	Only to be used for the purpose of splinting
f. Bleeding control	R	B	A	I	P	Includes use of tourniquets
g. Wound packing	R	B	A	I	P	
h. non-invasive eye irrigation	R	B	A	I	P	
i. Complex eye irrigation with Morgan® lens					P	
Movement/Extrication of Patients						
a. Emergency moves for endangered patients	R	B	A	I	P	
b. Rapid extrication of patients	R	B	A	I	P	

Scope of Practice

Medication	Levels					Interpretive Guidelines
Albuterol		B	A	I	P	*EMT-B May only administer the patient's prescribed, inhaler with orders from medical direction .
Amiodarone				I	P	
Aspirin	R*	B*	A	I	P	*EMR/EMT-B may give to patients with suspected cardiac-related chest pain only
Ativan				I	P	
Atropine				I	P	
Dextrose			A	I	P	
Diazepam				I	P	
Diphenhydramine				I	P	
Epinephrine 1:1,000	R*	B*	A*	I	P	*EMRs May use Epi-pen auto-injectors only. *EMT/AEMT May use a needle and syringe for IM injection to treat anaphylaxis
Epinephrine 1:10,000				I	P	
Fentanyl				I	P	
Furosemide				I	P	
Glucagon			A	I	P	
Glucose (Oral)		B	A	I	P	
Heparin Sodium				I	P	
Ipratropium			A	I	P	
IV Crystalloid Solutions			A	I	P	
Lidocaine (Bolus)			A*	I	P	*AEMTs may only use with IO for local anesthetic
Lidocaine (Drip)				I	P	
Mark I Kit	R	B	A	I	P	Approved for all levels , including EMR, for self and peer administration.
Morphine Sulfate				I	P	
Naloxone HCL	R*	B*	A	I	P	*EMR/EMT-B use unit-dose auto injector , or commercial, premeasured, unit-dose nasal spray
Nitroglycerine 0.4mg tablet or metered spray		B*	A	I	P	*EMT-B only administer patient's prescribed medication with verbal orders from medical direction

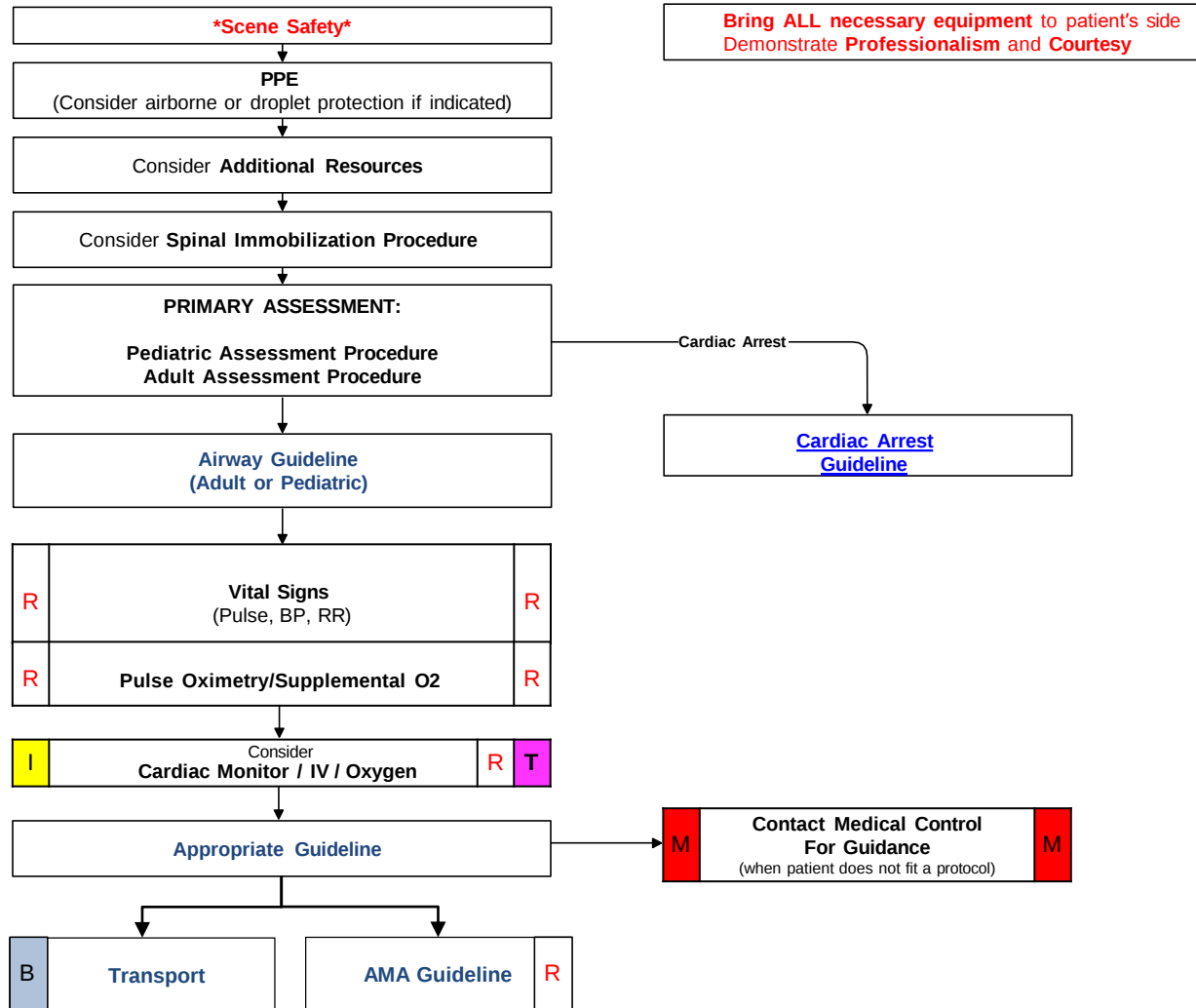
Scope of Practice

Medication	Levels					Interpretive Guidelines
Nitroglycerine (Drip)				I*	P	*IEMTs: Monitoring, titrating, and discontinuing infusion drips initiated by a healthcare facility
Nitrous Oxide			A	I	P	
Ondansetron				I	P	
Sodium Bicarbonate				I	P	
Thiamine				I	P	
Vasopressin				I	P	
Xopenex				I	P	
Monitoring Other Existing Medications		B*	A*	I	P	*EMT/AEMTs monitor only medications they are authorized to administer.

- Wyoming Office of Emergency Medical Services and Trauma. (Rev. 2021, March 10). Scope of Practice for EMS Personnel.

<https://health.wyo.gov/publichealth/ems/rules-and-scope-of-practice/scopeofpractice/>

Universal Patient Guideline

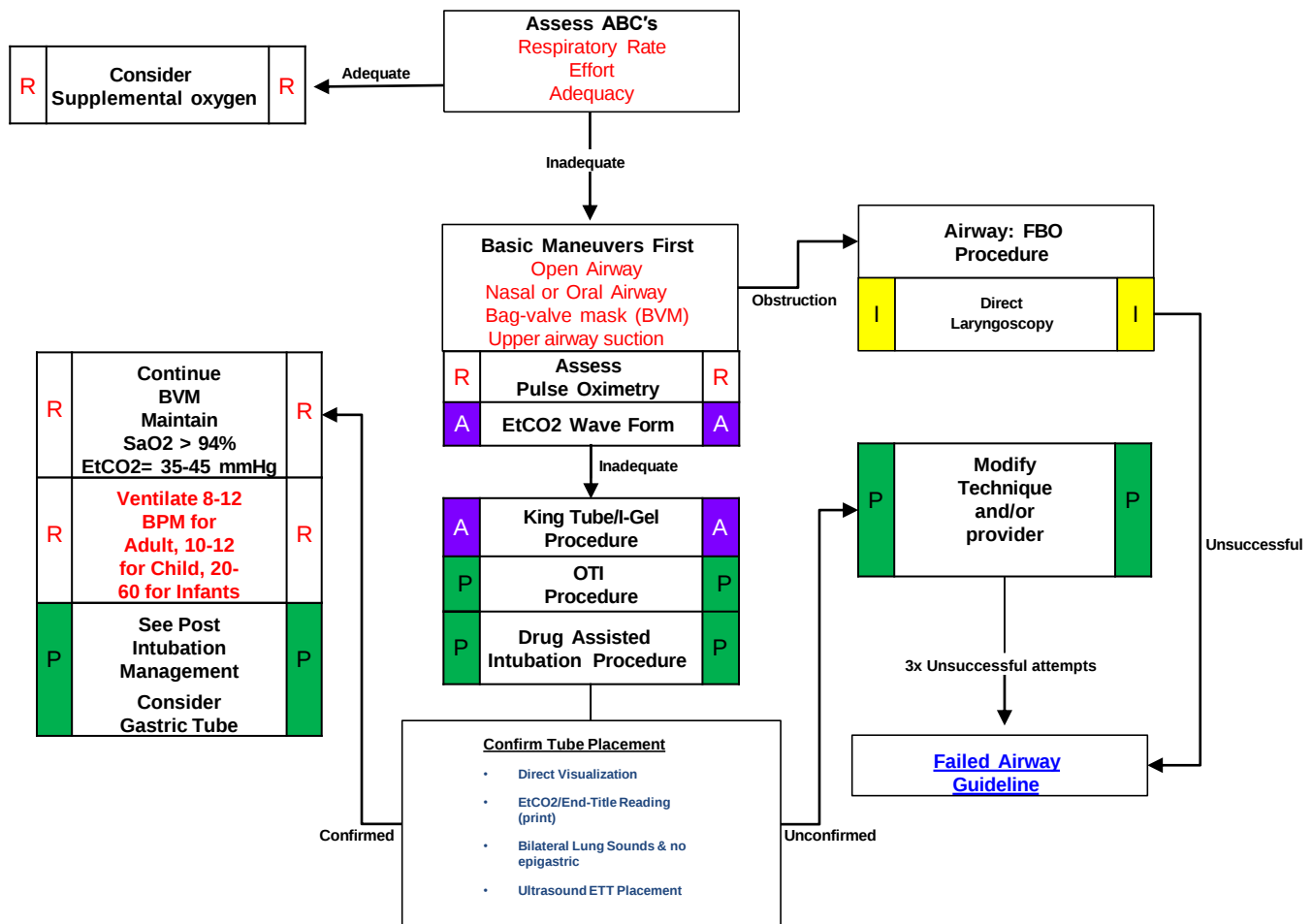


Pearls:

Exam: Minimum exam (if not noted on the specific protocol): Vital signs, mental status, and location of injury or complaint.

- The Broselow-Luten tape, or another similar tape defines pediatric patients
- Any patient contact which does not result in an EMS transport must have a completed Refusal documented.
- Required vital signs on every patient include: **pulse, respirations, and blood pressure**. IF stable, vitals every 15 minutes (Two sets of vitals minimum). IF unstable, vitals every 5 minutes.
- Pulse oximetry, blood glucose measurement and temperature measurement are dependent on the specific complaint.
- Timing of transport should be based on patient's clinical condition.

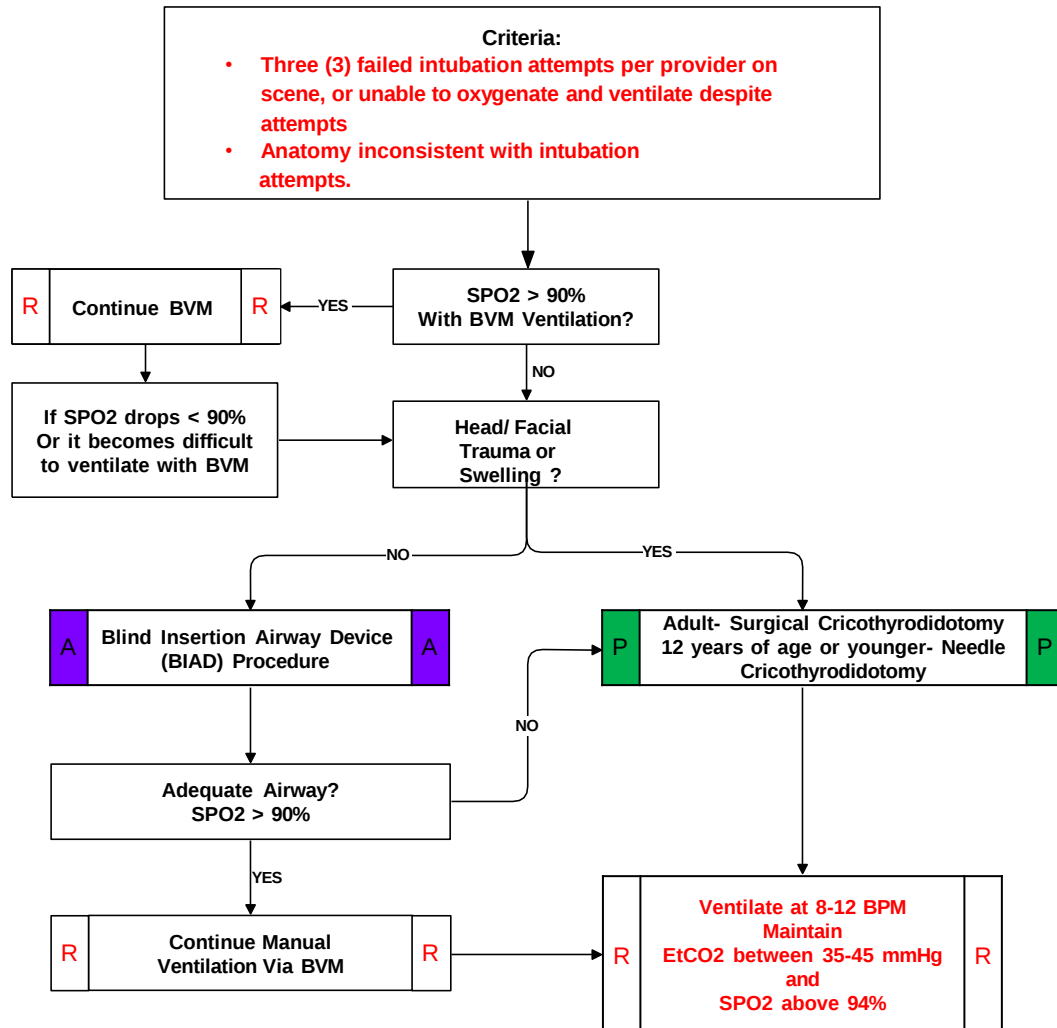
Airway



Pearls:

- Capnometry, and Auscultation is mandatory with all methods of intubation. Document results.
- **Continuous waveform EtCO2 monitoring is required for all intubated patients.**
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Do not assume hyperventilation is psychogenic.
- External laryngeal manipulation or the BURP maneuver may be used to assist with difficult intubations.
- An BIAD Airway when they are unable to intubate a patient.
- Hyperventilation in head trauma should only be done to maintain a EtCO2 of 40 mmHg.
- Nasogastric/Orogastric tube placement should be considered in all intubated patients.
- Continuous pulse oximetry should be utilized in all patients with an inadequate respiratory function.
- Ventilatory rate should be 8-12 per minute to maintain EtCO2 of 35-45 mmHg.
- Consider c-collar to maintain ETT placement for all intubated patients
- ETT/Bougie may be utilized on the 1st, 2nd, or 3rd attempt, based on initial airway assessment.

Failed Airway



Pearls:

- Continuous pulse oximetry should be utilized in all patients with inadequate respiratory function.
- Continuous EtCO2 should be applied to all patients with respiratory failure and to all patients with advanced airways.
- Providers should consider using a BIAD airway when they are unable to intubate a patient.
- Nasogastric/Orogastric tube placement should be considered in all patients with advanced airways.
- Notify Medical Control AS EARLY AS POSSIBLE of the patient's difficult/failed airway.

Airway: RSI (L.E.M.O.N)

Indications:

- Failure to Protect Airway
- Unable to Oxygenate/Ventilate
- Impending Airway Compromise

Precautions:

- Inability to Visualize Landmarks
- Anticipated Difficult Airway

EVALUATING for the Difficult Airway Between 1 – 3% of patients who require endotracheal intubation have airways that make intubation difficult. Recognizing those patients who may have a difficult airway allows the paramedic to proceed with caution and to keep as many options open as possible. It also allows the paramedic to prepare additional equipment (such as a cricothyrotomy kit) that may not ordinarily be part of a standard airway kit. The mnemonic LEMON is useful in evaluating patients for signs that may be consistent with a difficult airway and should raise the paramedic's index of suspicion.

Look externally External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, extreme cachexia, edentulous mouth, facial trauma, obesity, large front teeth or "buck teeth", high arching palate, receding mandible, short bull neck.

Evaluate 3-3-2 Rule 3 fingers between the patient's teeth (patient's mouth should open adequately to permit three fingers to be placed between the upper and lower teeth) 3 fingers between the tip of the jaw and the beginning of the neck (under the chin) 2 fingers between the thyroid notch and the floor of the mandible (top of the neck).

Mallampati

Class I (easy) = visualization of the soft palate, fauces, uvula, anterior and posterior pillars.

Class II = visualization of the soft palate, fauces and uvula.

Class III = visualization of the soft palate and the base of the uvula.

Class IV (difficult) = soft palate is not visible at all.

Obstruction? Besides the obvious difficulty if the airway is obstructed with a foreign body, the paramedic should also consider other obstructors such as tumor, abscess, epiglottitis, or expanding hematoma.

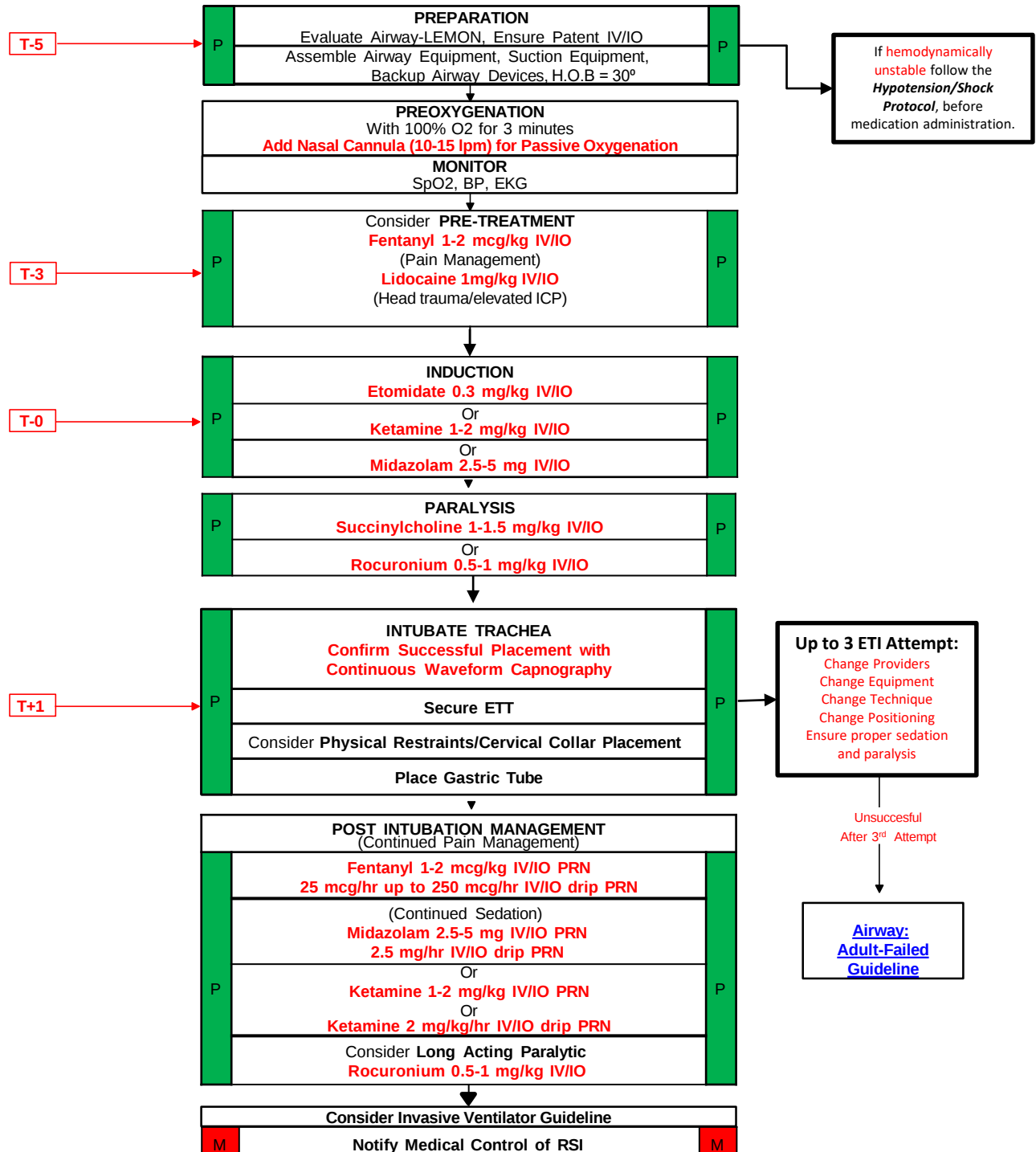
Neck Mobility Ask the patient to place their chin on their chest and to tilt their head backward as far as possible. Obviously, this will not be possible in the immobilized trauma patient.

Pearls

Preferred 2 Paramedics on scene.

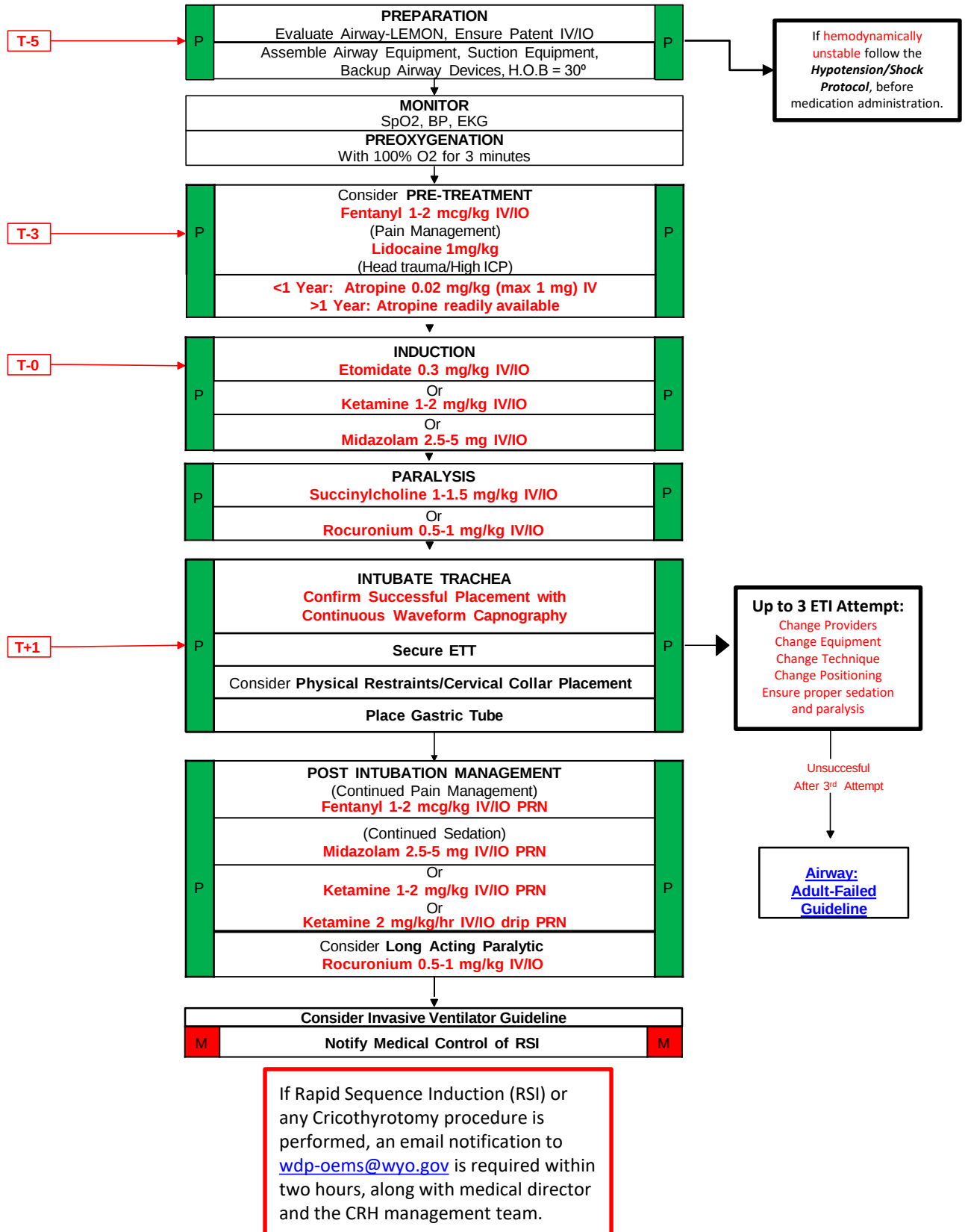
- **Once a patient has been given a paralytic drug, YOU ARE RESPONSIBLE FOR VENTILATIONS!**
- **This procedure will take away the patient's ability to breath on their own, you must be sure of your ability to intubate before giving medications (paralytics).**
- **Continuous Waveform Capnography and Pulse Oximetry are required for intubation verification and ongoing patient monitoring**
- Before administering any paralytic, screen for contraindications, and perform a thorough neurologic exam.
- If first intubation attempt fails, make an adjustment and try again:
 - Different laryngoscope blade
 - Change head positioning
 - Different ETT size
 - Change cricoid pressure
 - Consider BURP maneuver (Back [posterior], Up, and to pt's Right Pressure)
- **Continuous pulse oximetry should be utilized in all patients.**
- Divide the workload - ventilate, suction, cricoid pressure, drugs, intubation.
- All equipment must be in place and ready for use prior to administering any RSI drugs.
- Protect the patient from self-extubation when the drugs wear off. Longer acting paralytics may be needed post-intubation alongside proper sedation.

Airway: Adult RSI

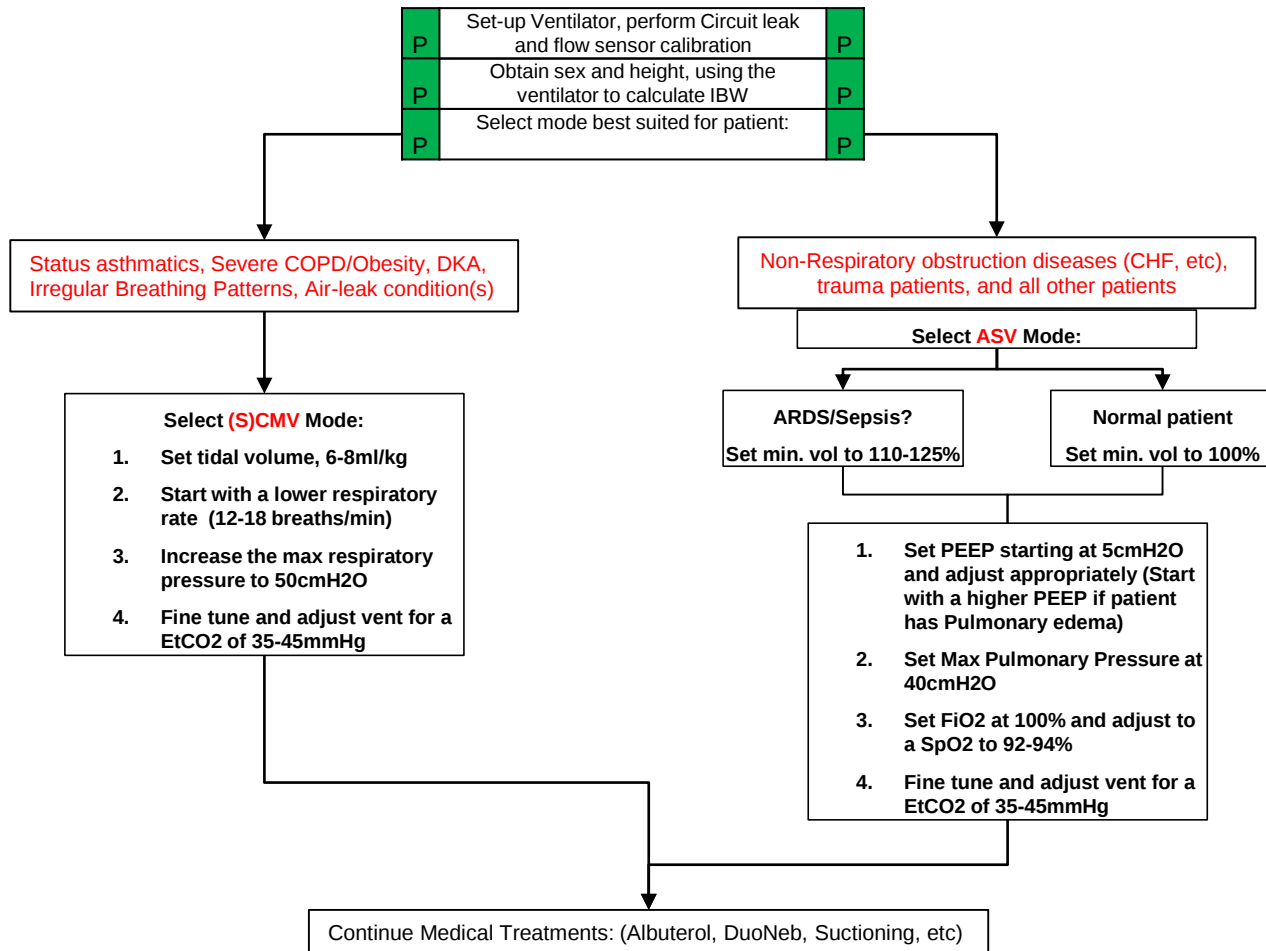


If Rapid Sequence Induction (RSI) or any Cricothyrotomy procedure is performed, an email notification to wdp-oems@wyo.gov is required within two hours, along with medical director and the CRH management team.

Airway: Pediatric RSI



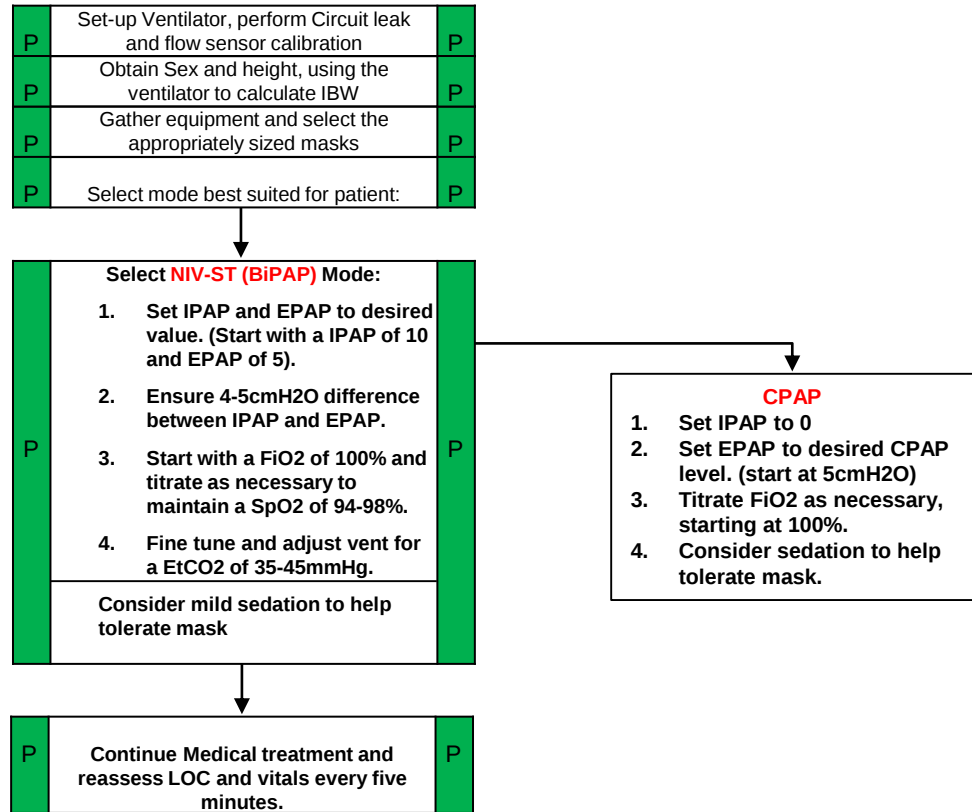
Airway: Hamilton Invasive Set-up Guide



Pearls:

- To manage EtCO₂, adjust rate and tidal-volume. Set the desired rate first and then adjust the Vt.
- Chronically obstructive lung disease, ARDS, or patients with poor lung compliance may have higher baseline EtCO₂; these patients are more likely to air-trap and should avoid being put on ASV mode.
- To manage oxygenation, you may adjust FiO₂ and PEEP. Adjusting FiO₂ first, by increments of 5-10%, and then PEEP by increments of 3-5cmH₂O.
- Note that a "air leak condition" may include a ET tube leak, tracheal disruption, bronchial disruption, or a broncho-pleural fistula.
- Monitor patient parameters with goal of achieving tidal volume of 8ml/kg maximum (4-6ml/kg for ARDS), and make only one change at a time and allow 3-4 breaths before making further changes.
- Elevate the head of the cot of all intubated patients approximately 30 degrees, unless contraindicated.

Airway: Hamilton Non-Invasive Set-up Guide



Pearls:

- Positive pressure ventilation with high PEEP will increase intrathoracic pressure, potentially causing poor preload which may result in low blood pressure.
- Insufficient respiratory effort or inability to protect the airway, pneumothorax, hemodynamic instability, poor mask seal due to facial trauma/surgery or deformity, altered level of consciousness to the point of not being able to follow commands, and active vomiting are all contraindications for BiPAP and CPAP.
- It is important to explain and coach the patient on the procedure in order to help manage anxiety.
- If the respiratory status deteriorates, remove the device and consider BVM ventilation and/or RSI.
- Notify receiving hospital as soon as possible if the patient is on CPAP or BiPAP so they can prepare.
- Watch for gastric distension and/or nausea. Suctioning of secretions may be required with some patients.

Pulmonary Edema

History:

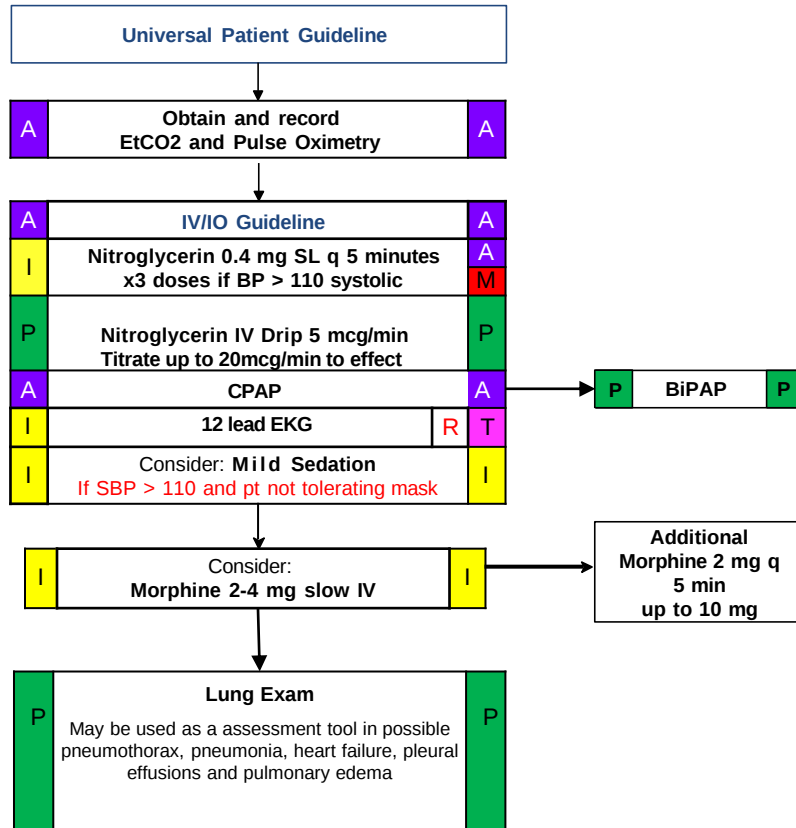
- CHF, altitude injury/HAPE, drowning/near drowning, toxic inhalation injury
- Past medical history
- Medications (digoxin, lasix)
- Viagra, Levitra, Cialis
- Cardiac history – past myocardial infarction

Signs/Symptoms:

- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential:

- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure



Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- **Avoid Nitroglycerin in any patient who has used Viagra or Levitra in the past 24 hours or Cialis in the past 36 hours due to possible severe hypotension.**
- If patient has taken nitroglycerin without relief, consider potency and check for undissolved tablets
- Consider **Myocardial Infarction** in: Diabetics, females, and geriatrics.
- These patients often have atypical pain, or only generalized complaints.
- **Careful monitoring of level of consciousness, BP, and respiratory status with above interventions is essential.**
- Allow the patient to be in their position of comfort to maximize their breathing effort. If patient condition precludes use of indicated NTG spray, proceed to NTG drip.
- If Nitro drip is used, do not continue to use Nitro Spray.
- Document CPAP application with copy of wave form. Document 12 Lead with copy of 12-Lead.

Respiratory Distress

History:

Asthma, COPD-chronic bronchitis/emphysema, CO poisoning, toxic inhalation injury
Home treatment (oxygen, nebulizer)
Medications (theophylline, steroids, inhalers)
Toxic exposure, smoke inhalation

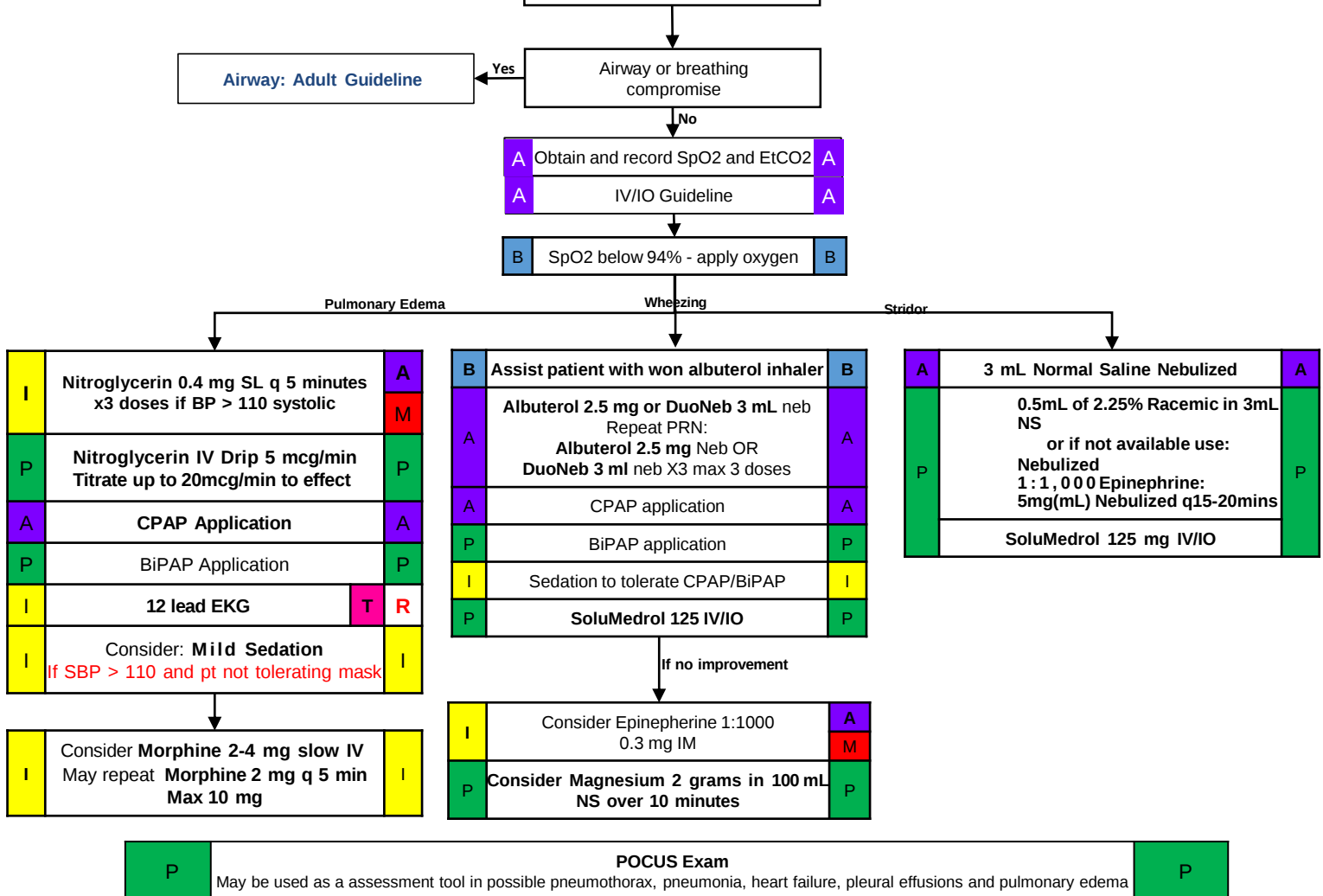
Signs and Symptoms:

Shortness of breath
Pursed lip breathing
Decreased ability to speak
Increased respiratory rate and effort
Wheezing, bronchi, rales, stridor
Use of accessory muscles
Fever, cough
Tachycardia

Differential:

Asthma
Anaphylaxis
Aspiration
COPD (Emphysema, Bronchitis)
Pleural effusion
Pneumonia
Pulmonary embolus
Pneumothorax
Cardiac (MI or CHF)
Pericardial tamponade
Hyperventilation
Inhaled toxin (Carbon monoxide etc.)

Universal Patient Care Guideline



- EMT-B administration of albuterol MDI is restricted only to patients who are under doctor's orders/ prescription for an albuterol MDI. EMT-B may only assist with the patient's OWN albuterol MDI.
- Pulse oximetry should be monitored continuously if initial saturation is < or = 94%, or there is patient deterioration.
- CPAP may be considered in asthma/COPD patients not responding to bronchodilators. This requires continuous monitoring for hypotension, changes in mental status.
- **Contact Medical Control** prior to administering IV Epinephrine in patients who are >50 years of age, have a history of cardiac disease, or if the patient's heart rate is >150. Epinephrine may precipitate cardiac ischemia. A 12 Lead EKG should be performed on these patients.
- A silent chest (in the case of respiratory distress) is a sign of pre-respiratory arrest.
- **EtCO2 should be recorded for patients who require CPAP, SoluMedrol, or Epinephrine.**
- Do not delay transport on critical patients or life saving treatments for ultrasound

Asystole

History:

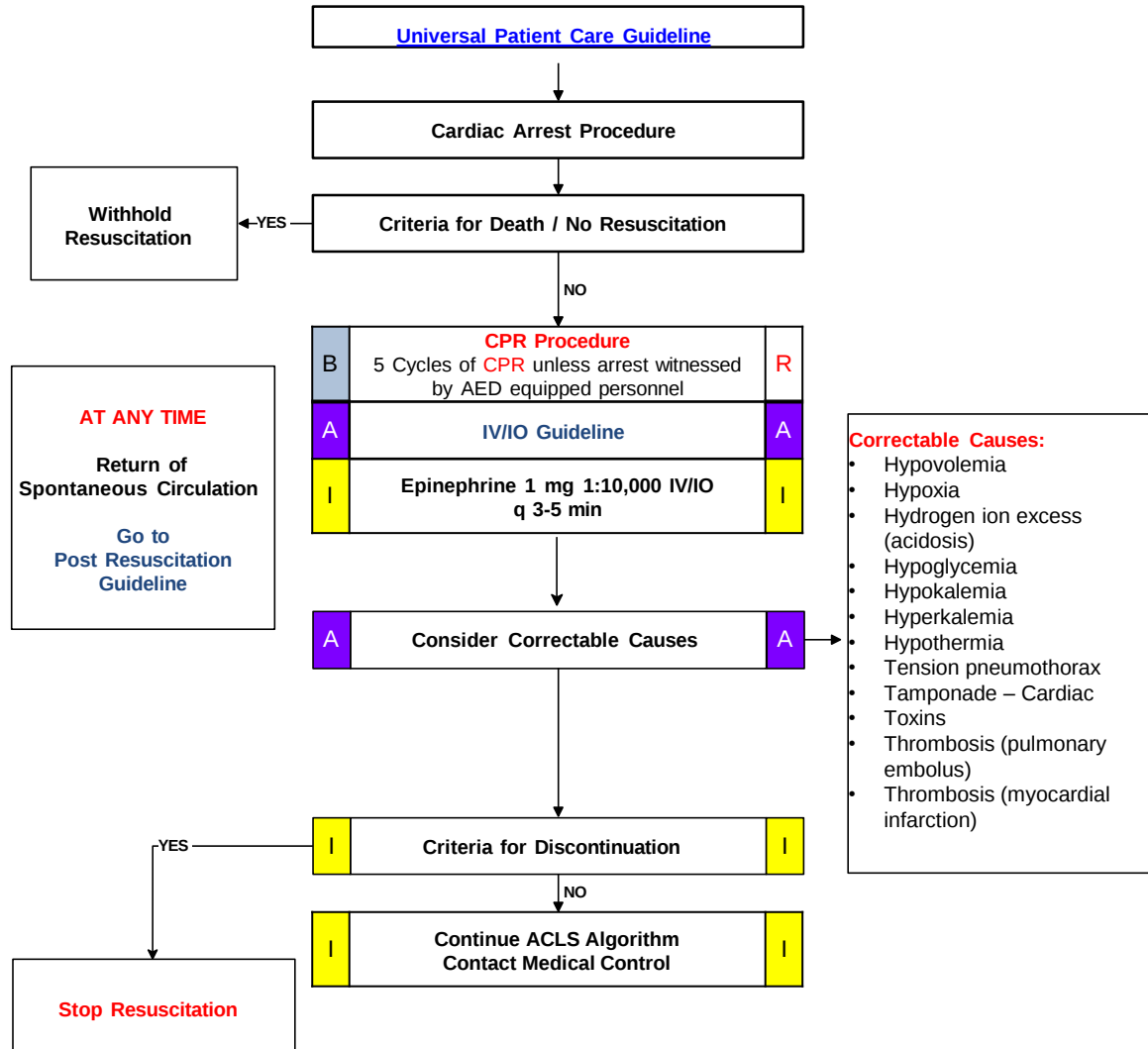
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
- DNR

Signs and Symptoms:

- Pulseless
- Apnea
- No electrical activity on ECG
- No auscultated heart tones

Differential:

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


Pearls:

Exam: Mental Status

- Always confirm asystole in more than one lead with maximum gain.
- Correctable causes must be addressed.

Atrial Fibrillation/Atrial Flutter

History:

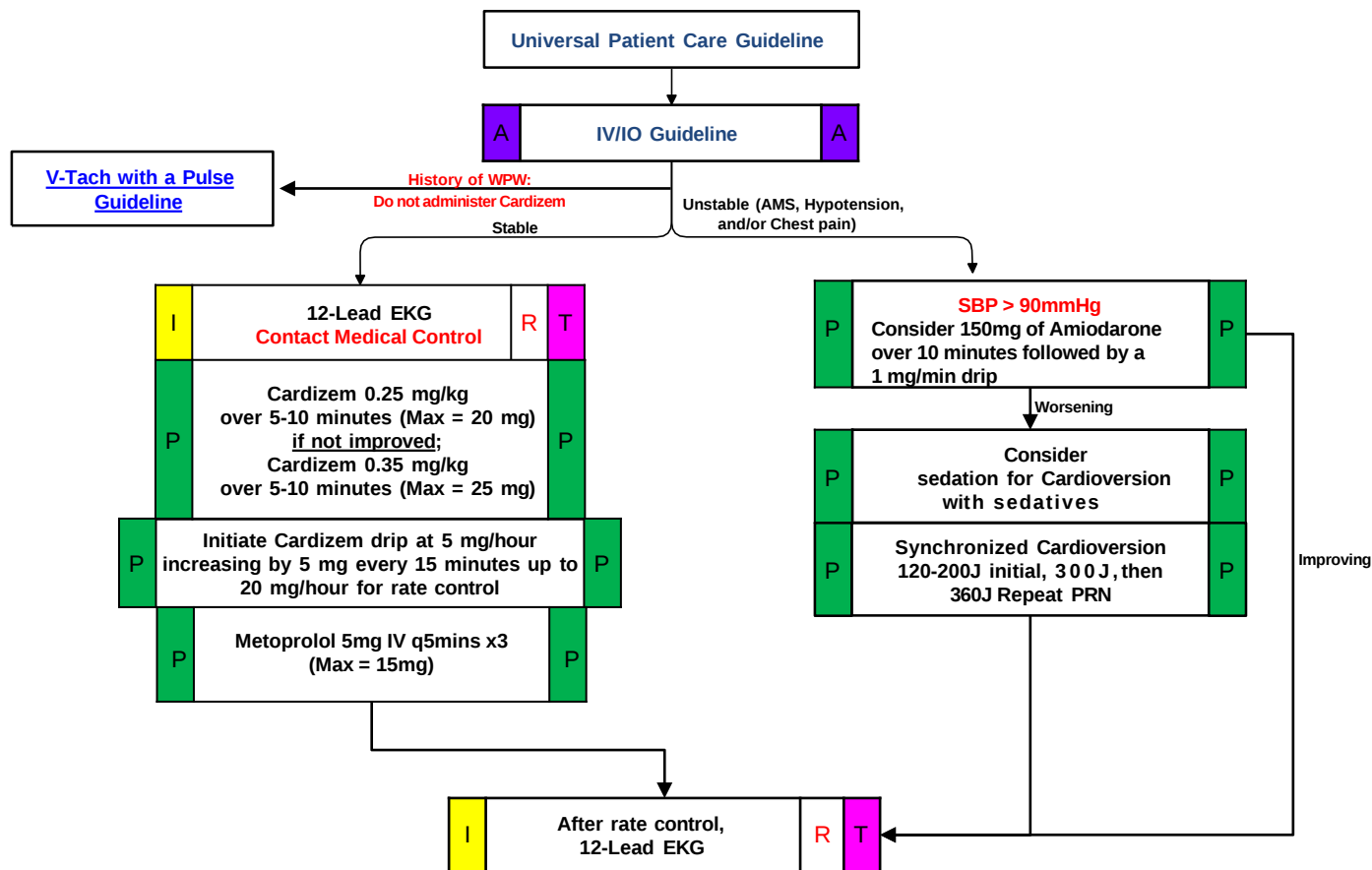
- Medications
 - Aminophylline
 - Diet pills
 - Thyroid supplements
 - Decongestants
 - Digoxin
- Diet (caffeine, chocolate)
- Drugs (stimulants, meth)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

Signs and Symptoms:

- HR > 130/Min
- **QRS < .12 Sec**
- Dizziness, CP, SOB
- Potential presenting rhythm
 - Sinus tachycardia
 - Atrial fibrillation / flutter
 - Multifocal atrial tachycardia

Differential:

- 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



Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- Adenosine may not be effective in identifiable atrial flutter/fibrillation, yet is not harmful.
- Monitor for hypotension after administration of Cardizem.
- Monitor for respiratory depression and hypotension associated with Versed.
- Continuous pulse oximetry is required for all Atrial Fibrillation patients.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Bradycardia

History:

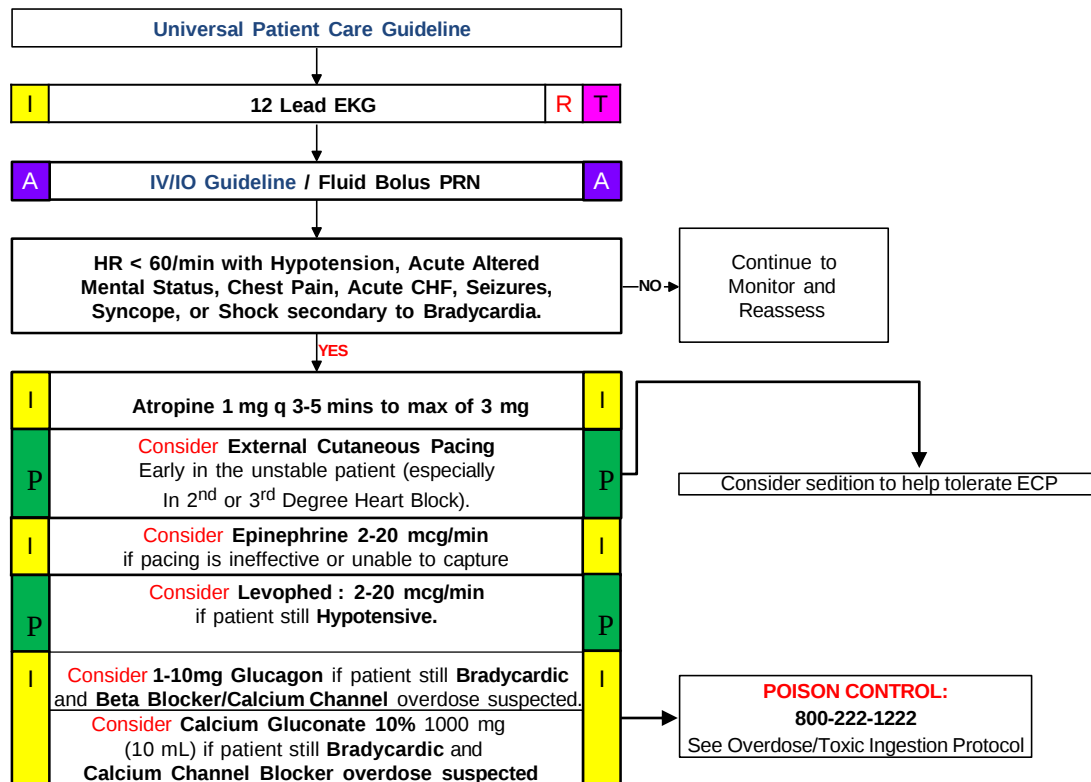
- Past medical history
- Medications
- Beta-Blockers (Toprol, Atenolol)
- Calcium channel blockers (Verapamil, Calan)
- Clonidine
- Digitalis
- Pacemaker

Signs and Symptoms:

- HR < 60/min
- Chest pain
- Respiratory distress
- Hypotension or Shock
- Altered mental status
- Syncope

Differential:

- Acute myocardial infarction
- Hypoxia
- Hypothermia
- Sinus bradycardia
- Athletes
- Head injury (elevated ICP) or Stroke
- Spinal cord lesion
- Sick sinus syndrome
- AV blocks (1°, 2°, or 3°)
- Overdose



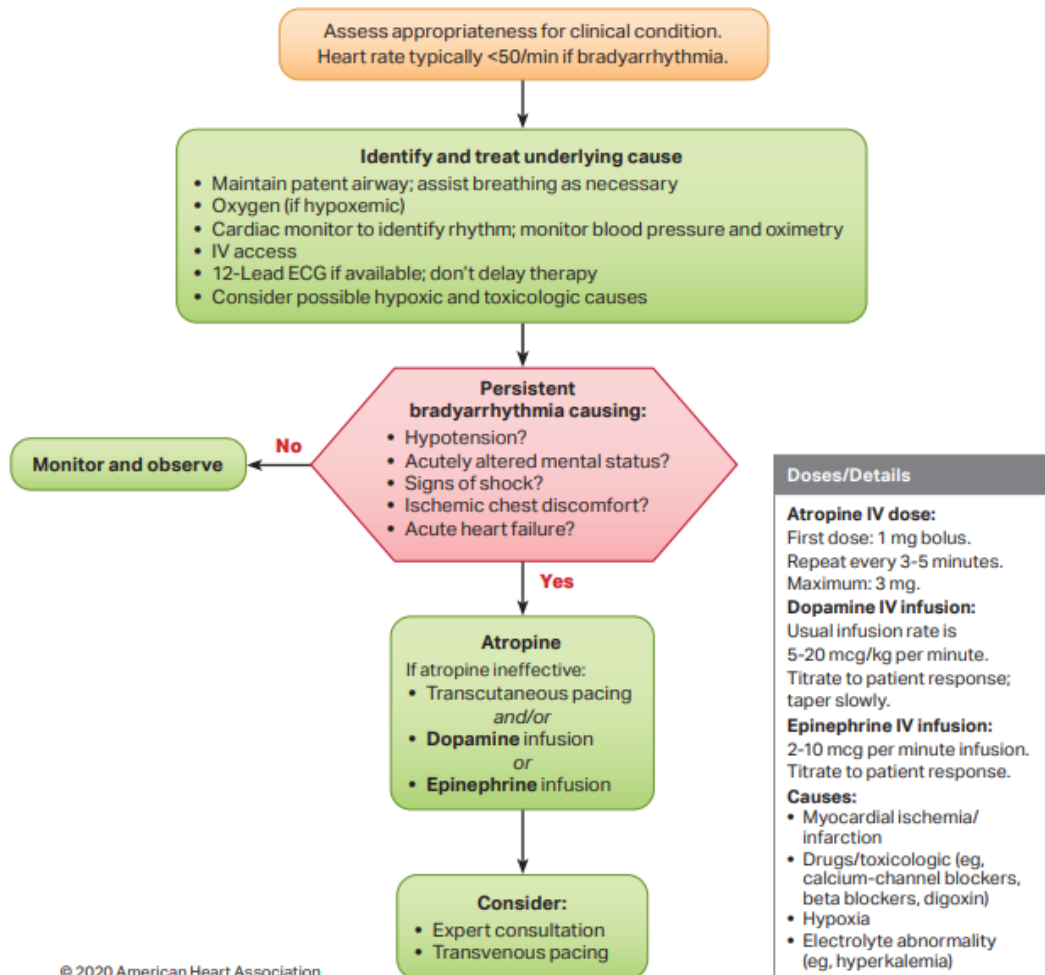
Pearls:

Exam: Mental Status, Neck, Heart, Lungs, Neurological

- **The use of lidocaine in heart block can worsen bradycardia and lead to asystole and death.**
- Pharmacological treatment of bradycardia is based upon the presence or absence of symptoms.
- If symptomatic, treat. If asymptomatic, monitor only.
- **Remember: The use of atropine with PVC's in the presence of an MI may worsen heart damage.**
- Consider treatable causes for bradycardia (Beta blocker OD, Calcium channel blocker OD, etc.)
- Be sure to aggressively oxygenate the patient and support respiratory effort.

Bradycardia AHA

Adult Bradycardia Algorithm



Cardiac Arrest

History:

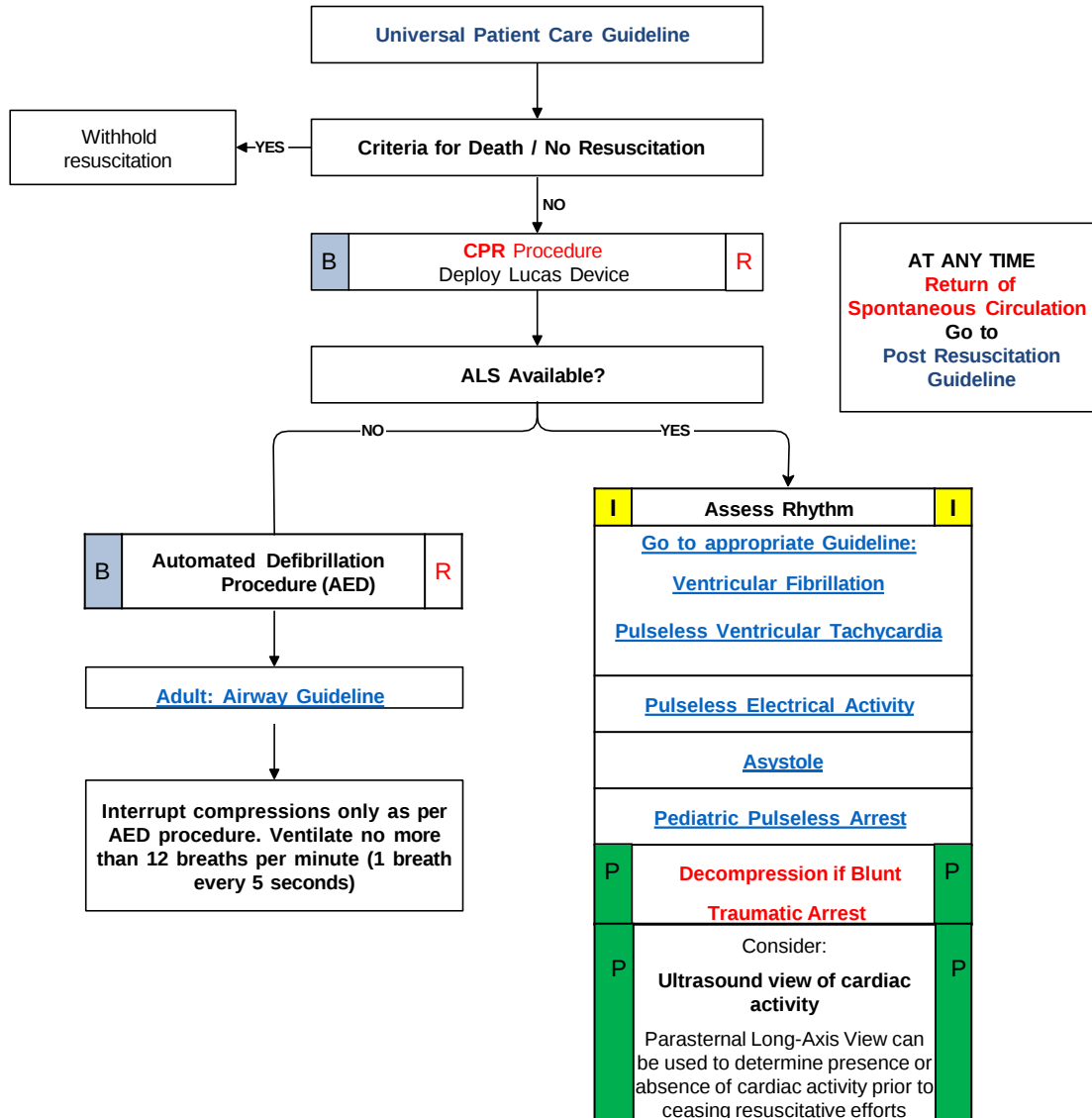
- Events leading to arrest
- Estimated downtime
- Past medical history
- Medications
- Existence of terminal illness
- Signs of lividity, rigor mortis
- DNR

Signs and Symptoms:

- Unresponsive
- Apneic
- Pulseless

Differential:

- Medical vs Trauma
- V. fib vs Pulseless V. tach
- Asystole
- Pulseless electrical activity (PEA)



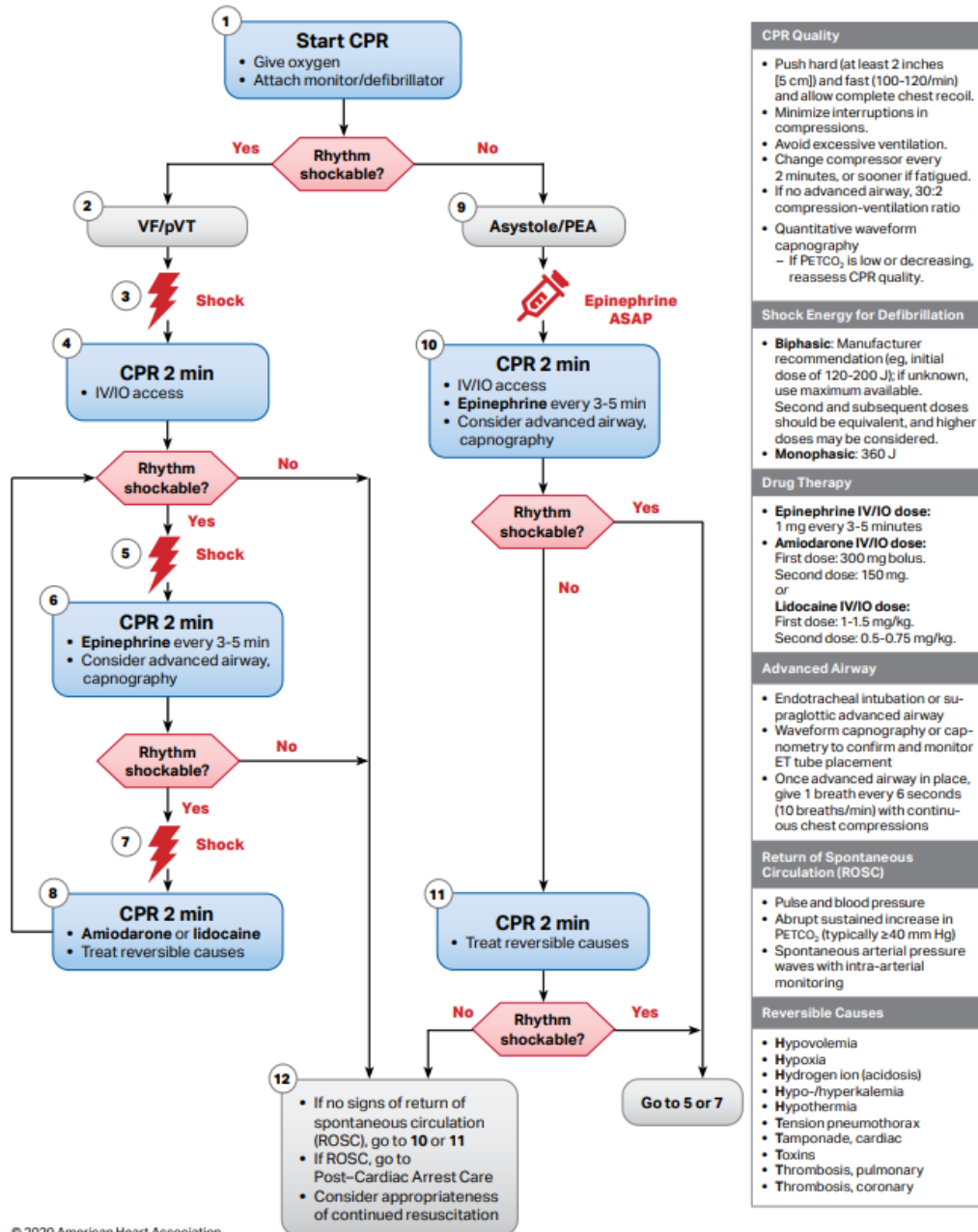
Pearls:

Exam: Mental Status

- Success is based on proper planning and execution. Procedures require space and patient access. Make room to work.
- Reassess airway frequently and with every patient move.
- Maternal Arrest: Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport transport. Post-mortem C-section ideally happens 6 minutes post-arrest.
- Adequate compressions with timely defibrillation are the keys to success.
- In the obviously pregnant patient manually displace the uterus to the left to relieve pressure on the Vena Cava.

Cardiac Arrest AHA

Adult Cardiac Arrest Algorithm

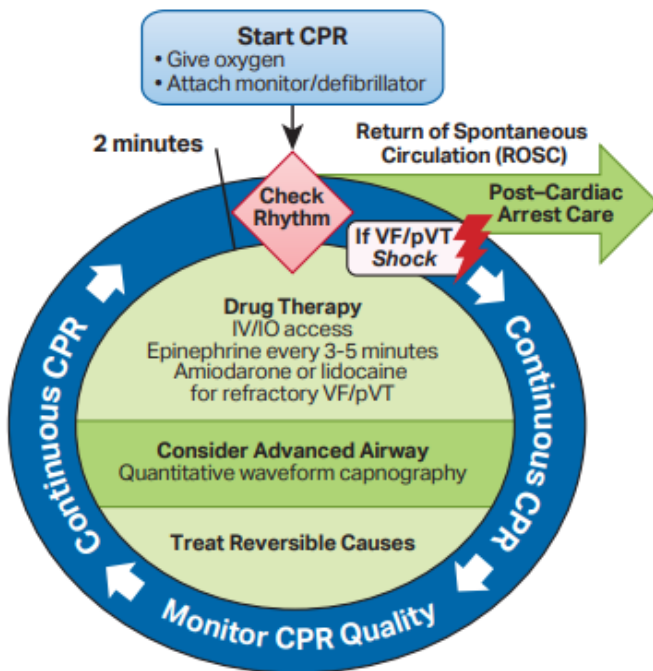


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CPR Quality
- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil. - Minimize interruptions in compressions. - Avoid excessive ventilation. - Change compressor every 2 minutes, or sooner if fatigued. - If no advanced airway, 30:2 compression-ventilation ratio - Quantitative waveform capnography - If PETCO₂ is low or decreasing, reassess CPR quality.
Shock Energy for Defibrillation
Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered. Monophasic: 360 J
Drug Therapy
Epinephrine IV/IO dose: 1 mg every 3-5 minutes Amiodarone IV/IO dose: First dose: 300 mg bolus. Second dose: 150 mg, or Lidocaine IV/IO dose: First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.
Advanced Airway
- Endotracheal intubation or supraglottic advanced airway - Waveform capnography or capnometry to confirm and monitor ET tube placement - Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions
Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure - Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg) - Spontaneous arterial pressure waves with intra-arterial monitoring
Reversible Causes
- Hypovolemia - Hypoxia - Hydrogen ion (acidosis) - Hypo-/hyperkalemia - Hypothermia - Tension pneumothorax - Tamponade, cardiac - Toxins - Thrombosis, pulmonary - Thrombosis, coronary

Cardiac Arrest Circle AHA

Adult Cardiac Arrest Circular Algorithm



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CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
 - If PETCO₂ is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
- **Lidocaine IV/IO dose:** First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- | | |
|---------------------------|-------------------------|
| • Hypovolemia | • Tension pneumothorax |
| • Hypoxia | • Tamponade, cardiac |
| • Hydrogen ion (acidosis) | • Toxins |
| • Hypo-/hyperkalemia | • Thrombosis, pulmonary |
| • Hypothermia | • Thrombosis, coronary |

Chest Pain: Cardiac & STEMI

History:

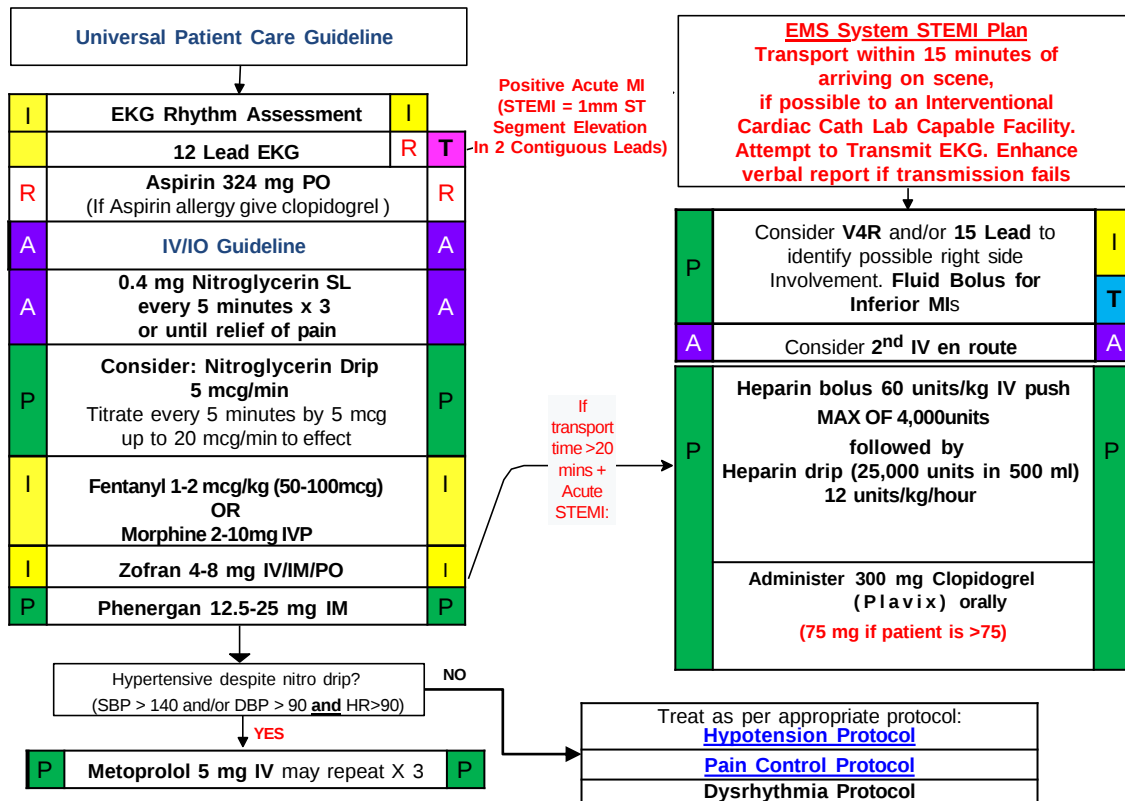
- Age
- Medications
 - Viagra, Levitra, Cialis
- Past medical history (MI, Angina, Diabetes, Post Menopausal)
- Allergies (Morphine, Lidocaine)
- Recent physical exertion

Signs and Symptoms:

- Chest pain (dull pain, pressure, aching, vicelike tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness

Differential:

- Trauma vs. Medical
- Angina vs. Myocardial infarction
- Pericarditis
- Pulmonary embolism
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- GE reflux or Hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose (Cocaine)



Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- Avoid Nitroglycerin in any patient who has used Viagra or Levitra in the past 24 hours or Cialis in the past 36 hours due to potential severe hypotension. Check for undissolved Nitro tablets if used prior to EMS arrival.
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- If positive STEMI EKG changes, establish a second IV while en route to the hospital.
- Monitor for hypotension after administration of nitroglycerin and morphine.
- Diabetics and geriatric patients often have atypical pain, or only generalized complaints.
- Try to avoid placing IVs in the right hand or wrist.

Pulseless Electrical Activity (PEA)

History:

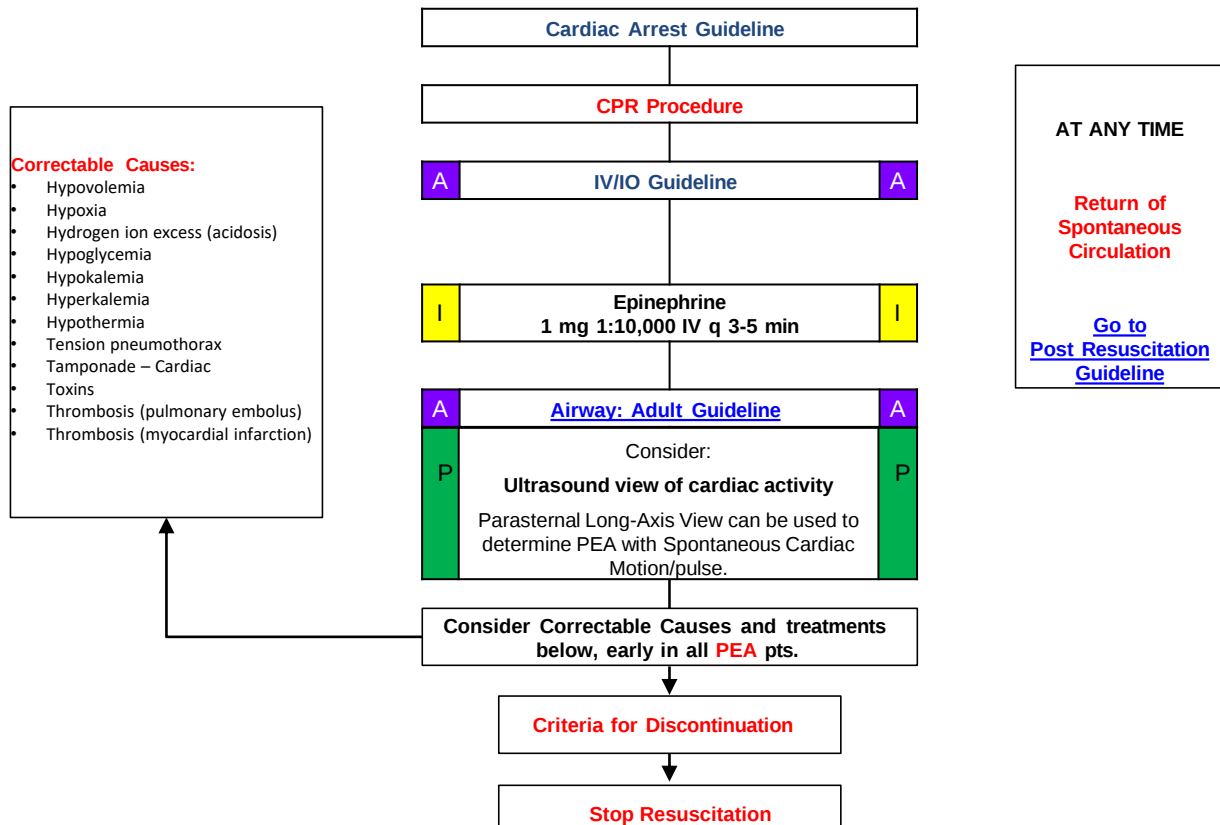
- Past medical history
- Medications
- Events leading to arrest
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
- Tricyclic medications
- Digitalis
- Beta blockers
- Calcium channel blockers
- DNR

Signs and Symptoms:

- Pulseless
- Apnea
- Electrical activity on ECG
- No heart tones on auscultation

Differential:

- Hypovolemia (Trauma, AAA, other)
- Cardiac tamponade
- Hypothermia
- Drug overdose (Tricyclics, Digitalis, Beta blockers, Calcium channel blockers)
- Massive myocardial infarction
- Hypoxia
- Tension pneumothorax
- Pulmonary embolus
- Acidosis
- Hyperkalemia



Pearls:

Exam: Mental Status

- Consider each possible cause listed in the differential: Survival is based on identifying and correcting the cause!
- If administering both CaCl and Bicarbonate, be sure to completely flush IV line or access a 2° IV line.
- ***DO NOT administer Calcium Gluconate or Sodium Bicarbonate to patients taking Digoxin (LANOXIN).***
- Discussion with **Medical Control** can be a valuable tool in developing a differential diagnosis and identifying possible treatment options.

Post-Resuscitation

History:

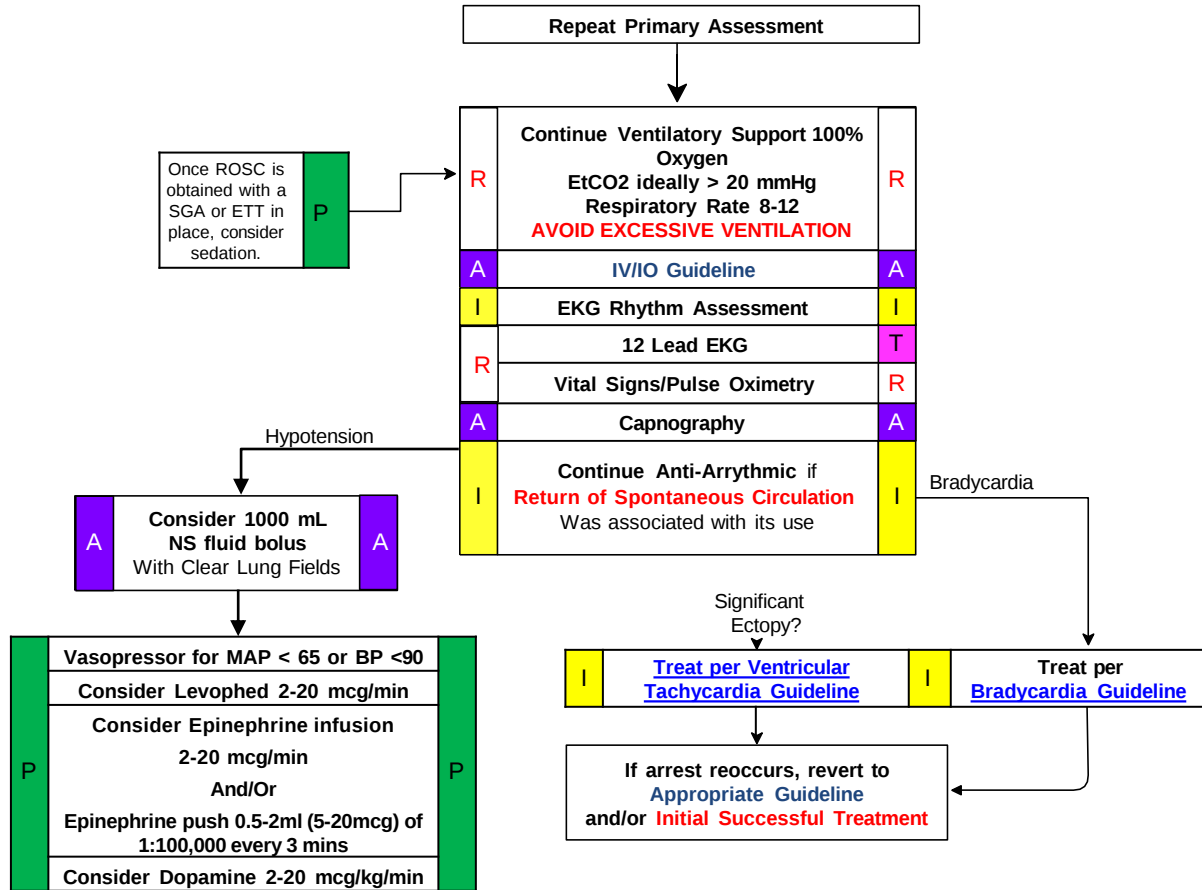
- Respiratory arrest
- Cardiac arrest

Signs/Symptoms:

- ROSC

Differential:

- Continue to address specific differentials associated with the original dysrhythmia


Pearls:

Exam: Mental Status, Neck, Skin, Lungs, Heart, Abdomen, Extremities, Neurological

- Excessive ventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided at all costs.
- 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 may be planned in consultation with medical control.
- Common causes of post-resuscitation hypotension include hyperventilation, hypovolemia, pneumothorax, and medication reaction to ALS drugs.
- Titrate vasopressor to maintain MAP of 65 or systolic >90. Ensure adequate fluid resuscitation is ongoing.

Supraventricular Tachycardia

History:

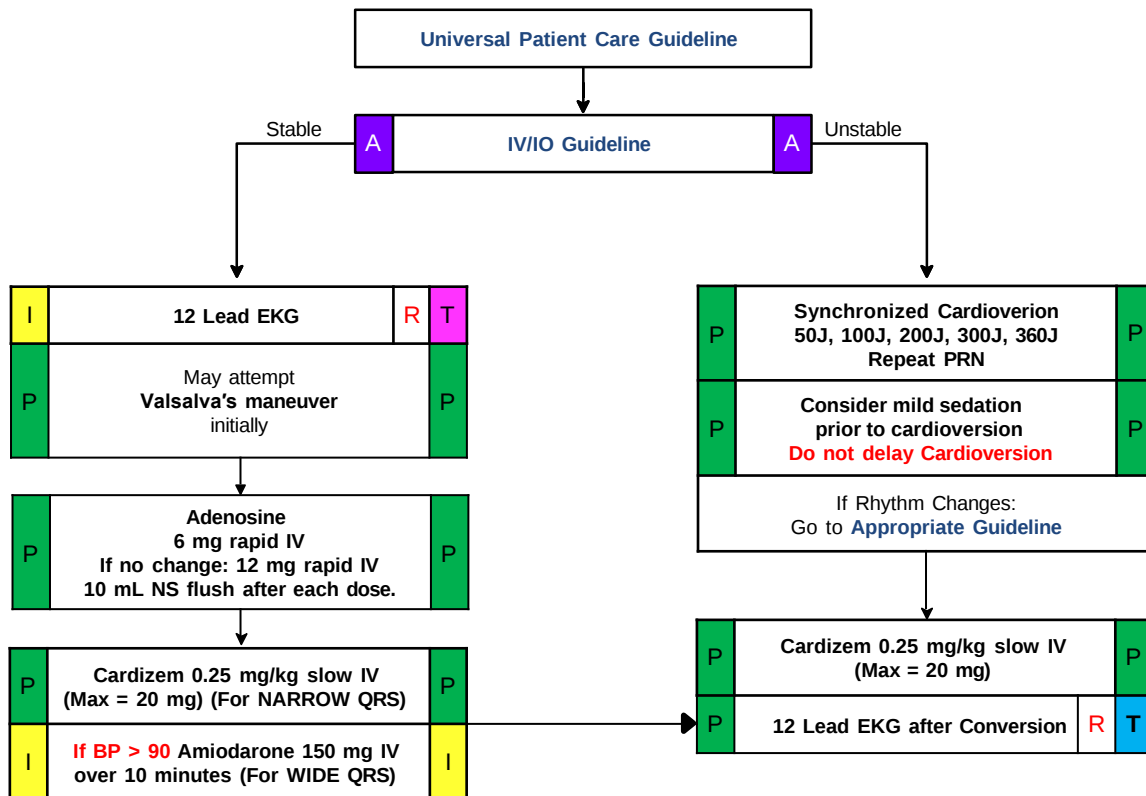
- Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, stimulants)
- Past medical history
- History of palpitations / heart racing
- Syncope / near syncope

Signs and Symptoms:

- HR > 150/Min, QRS<.12sec, regular
- **QRS > .12 sec, go to V-Tach Guideline**
- **If history of WPW, go to V-Tach Guideline**
- Dizziness, CP, SOB
- Potential alternative rhythm(s)
 - Sinus tachycardia Atrial
 - fibrillation / flutter
 - Multifocal Atrial Tachycardia

Differential:

- 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



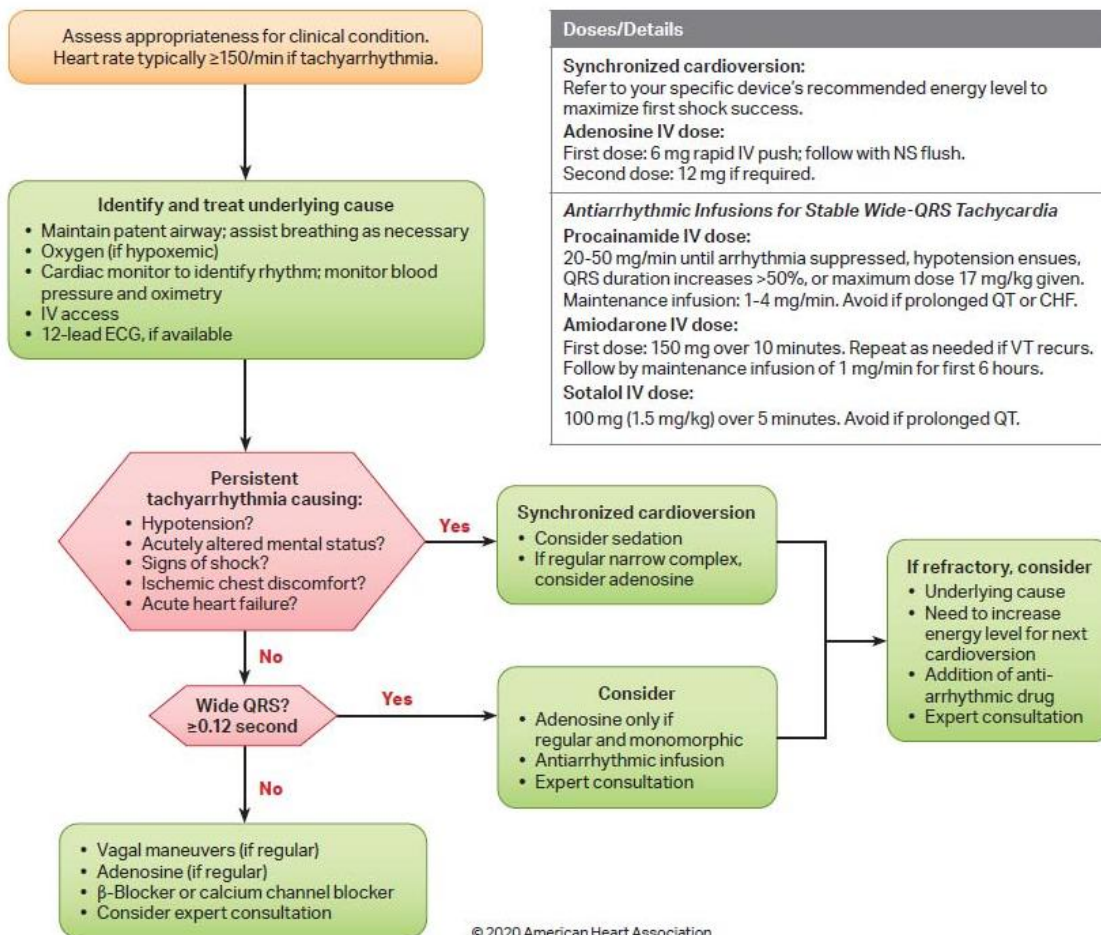
Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- **If patient has history of or 12 Lead EKG reveals Wolfe Parkinson White (WPW), DO NOT administer Adenosine, Beta Blockers, Calcium Channel Blockers, or Digoxin.**
- Adenosine may not be effective in identifiable Atrial Flutter/Fibrillation, yet is not harmful. Monitor for hypotension after administration of Cardizem.
- Monitor for respiratory depression and hypotension associated with Versed.
- Continuous pulse oximetry is required for all SVT Patients.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Tachycardia AHA

Adult Tachycardia With a Pulse Algorithm



Ventricular Fibrillation/ Pulseless Ventricular Tachycardia

History:

- Estimated down time
- Past medical history
- Medications
- Events leading to arrest
- Renal failure / dialysis
- DNR

Signs and Symptoms:

- Unresponsive, apneic, pulseless
- Ventricular fibrillation or ventricular tachycardia on ECG

Differential:

- Asystole
- Artifact / Device failure
- Cardiac
- Endocrine / Metabolic
- Drugs
- Pulmonary

Apply O2 via BVM with 1 or more OPA or NPA			
I	Defibrillation @ 200 J Immediately Initiate CPR Procedure for 2 minutes, then reassess rhythm	↔	Apply AED, analyze for shock Immediately Initiate CPR Procedure for 2 minutes, then reassess rhythm
R	Apply O2 via BVM with 1 or more OPA or NPA		
A	IV/IO Guideline starting NS/LR flowing		
I	Epinephrine 1 mg 1:10,000 IV/IO repeat every 3-5 minutes		
A	Consider Advanced Airway		
R	After 2 minutes / 5 cycles of CPR check rhythm and pulse		
If Rhythm shockable: Defibrillation @ 300 J, After resume CPR immediately			
I	Amiodarone 300 mg IV/IO Push May be repeated once at 150 mg in 5-10 minutes		
After 2 minutes / 5 cycles of CPR check rhythm and pulse			
If Rhythm shockable: Defibrillation @ 360 J, After defibrillation resume CPR immediately			
Airway: Adult Guideline Establish an advanced airway: Ventilations 10-12/min, Continuous Compressions 100/min			
Continue AHA ACLS algorithm, shocking at 360J as needed, otherwise consider discontinuation/contact medical control			

AT ANY TIME:

1. Rhythm Changes

Go to:
Appropriate
Guideline

2. ROSC (Return of Spontaneous Circulation)

Go to:
Post-Resuscitation
Guideline

OR →

I	Lidocaine 1-1.5 mg/kg repeat at 0.5-0.75mg/kg for second dose	I
---	--	---

Pearls:

- Wait **three to five minutes** between anti-arrhythmic doses.
- Reassess and document advanced airway placement and EtCO₂ frequently, after every move, and at discharge.
- **Calcium** and **sodium bicarbonate (DO NOT Mix together!)** if hyperkalemia is suspected (renal failure, dialysis).
- Polymorphic V-Tach (Torsades de Pointes) may benefit from administration of **magnesium sulfate**.
- **Effective CPR and prompt defibrillation are the keys to successful resuscitation.**
- If BVM successful, advanced airway may be deferred 2 to 3 defibrillation sequences or until rhythm changes.

Ventricular Tachycardia/ Wide Complex with Pulse

History:

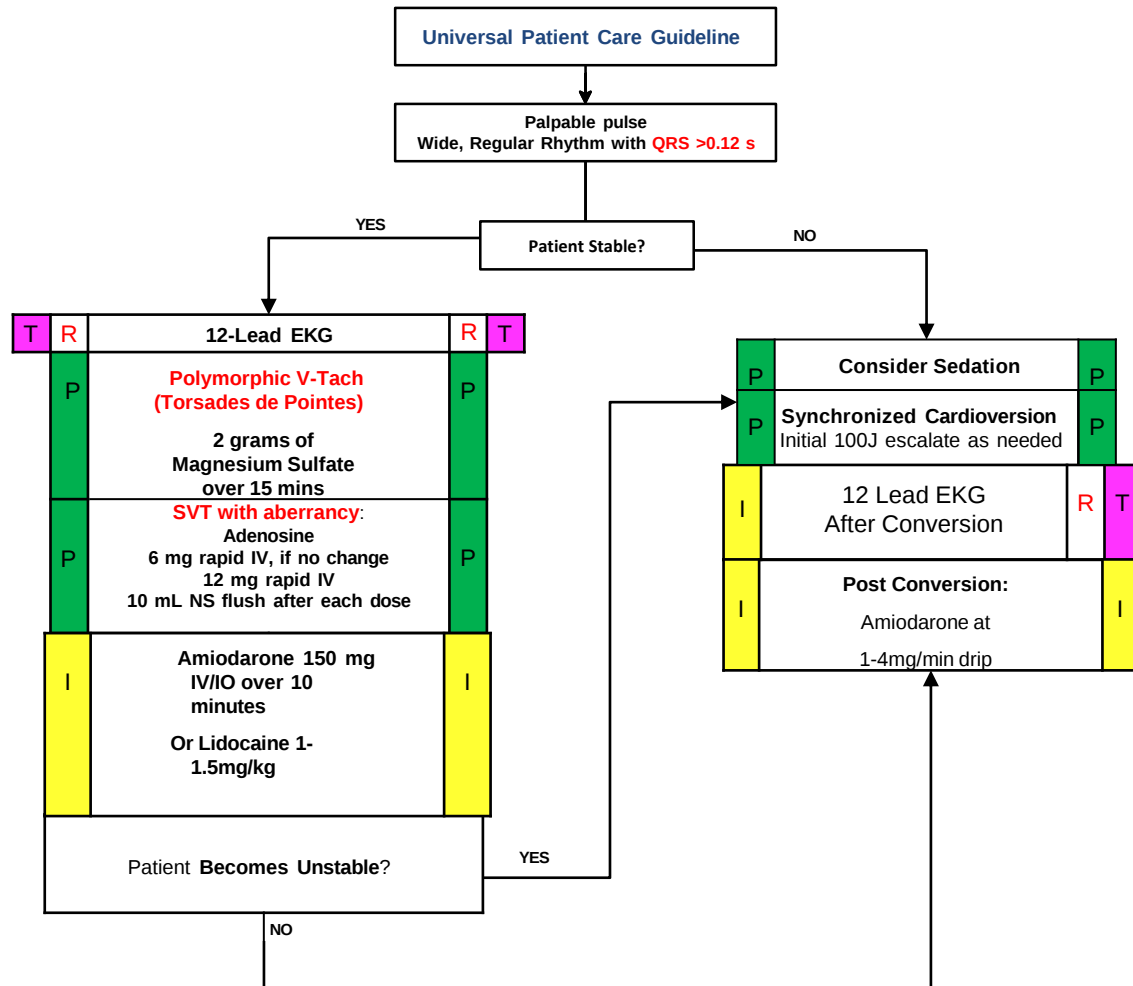
- Past medical history / medications, diet, drugs.
- Syncope / near syncope
- Palpitations
- Pacemaker
- Allergies: lidocaine / novacaine

Signs and Symptoms:

- 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 > .12 Sec

Differential:

- Artifact / Device failure
- Cardiac
- Endocrine / Metabolic
- Hyperkalemia
- Drugs
- Pulmonary



Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- For witnessed / monitored ventricular tachycardia, try having patient cough.
- If presumed hyperkalemia (end-stage renal disease, dialysis, etc), administer 1mEq/kg of **sodium bicarbonate**.

Allergic Reaction

History

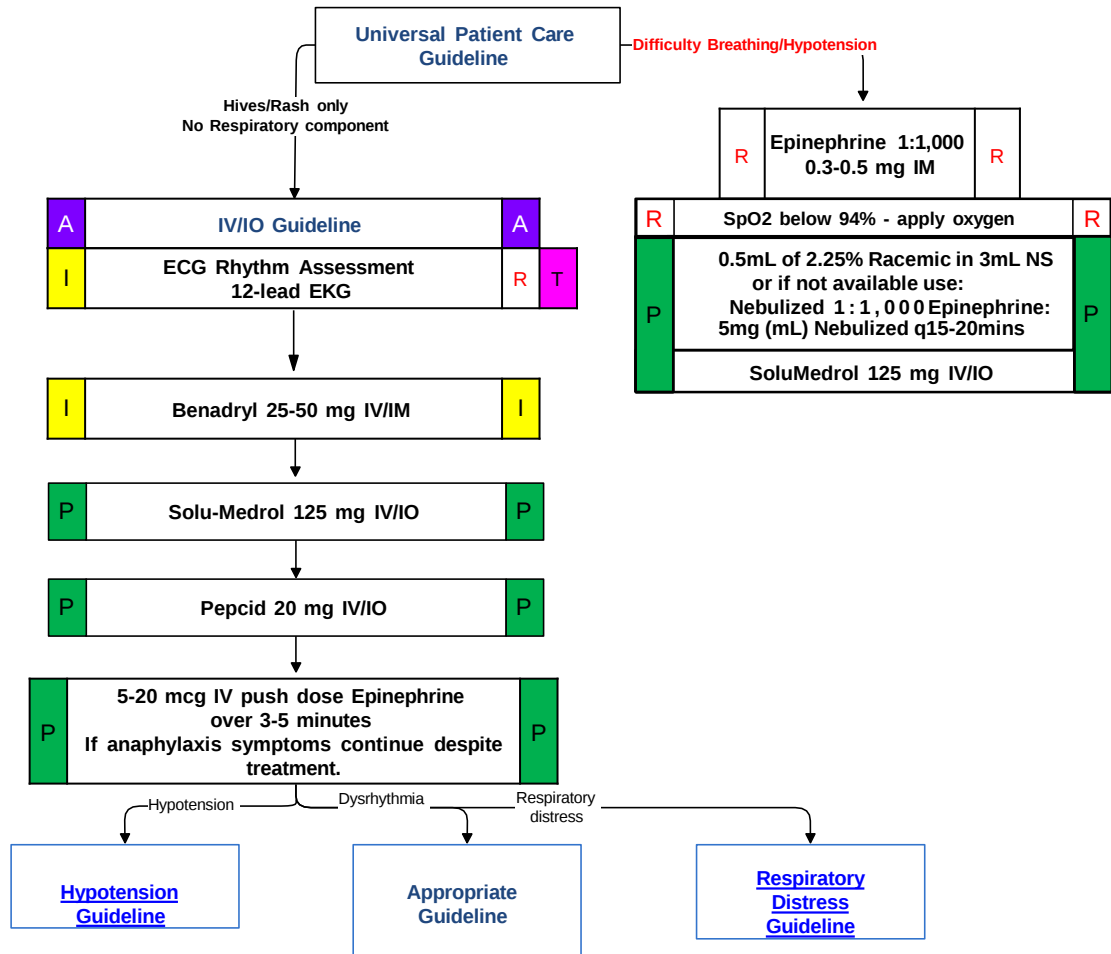
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms:

- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema

Differential:

- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF



Pearls:

Exam: Mental Status, Skin, Heart, Lungs

- **Use Caution** when administering IV epinephrine in patients who are >50 years of age, have a history of cardiac disease, or if the patient's heart rate is >150. Epinephrine may precipitate cardiac ischemia. These patients should receive a 12-lead EKG and careful monitoring.
- The shorter the onset of symptoms from contact, the more severe the reaction.

Altered Mental Status

History:

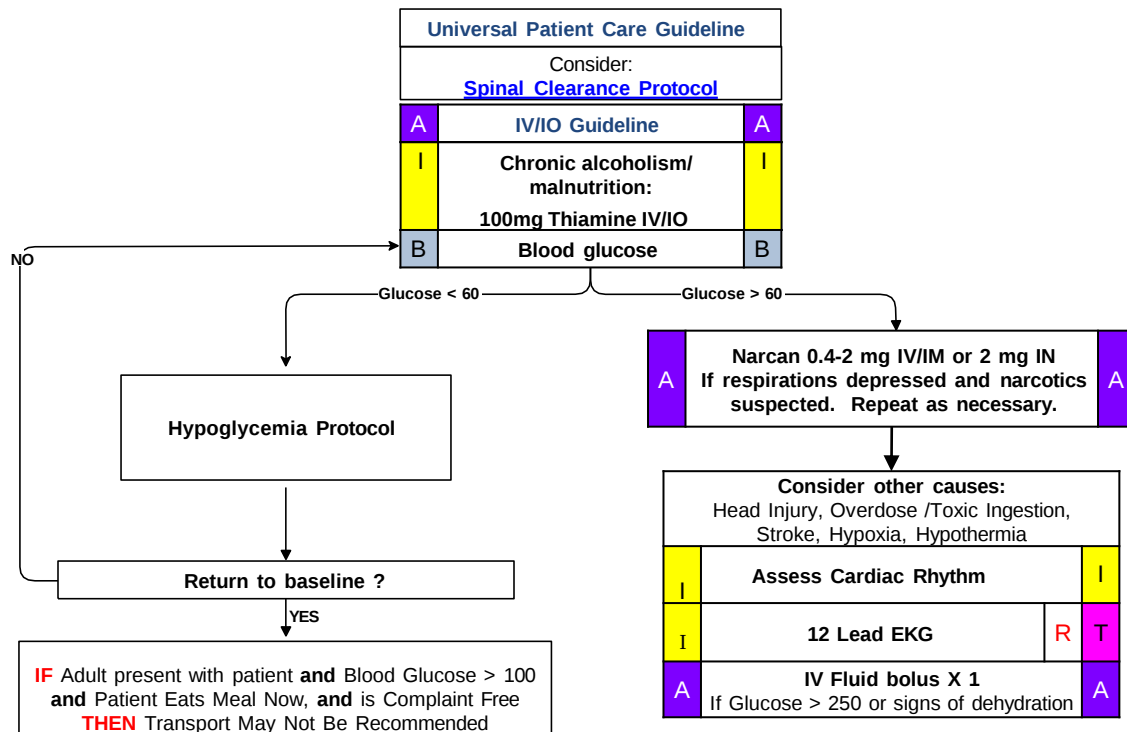
- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition

Signs/Symptoms:

- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul resps; signs of dehydration)

Differential:

- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Infection
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicologic
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality
- Psychiatric disorder



Pearls:

Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neurological

- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Recheck blood glucose after D10 or Glucagon.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia.
- Do not give oral glucose if patient cannot protect own airway.
- Consider restraints if necessary for patient's and/or personnel's protection per the restraint procedure.
- Thiamine may be omitted if the patient has no signs of malnutrition or ETOH

Back Pain

History:

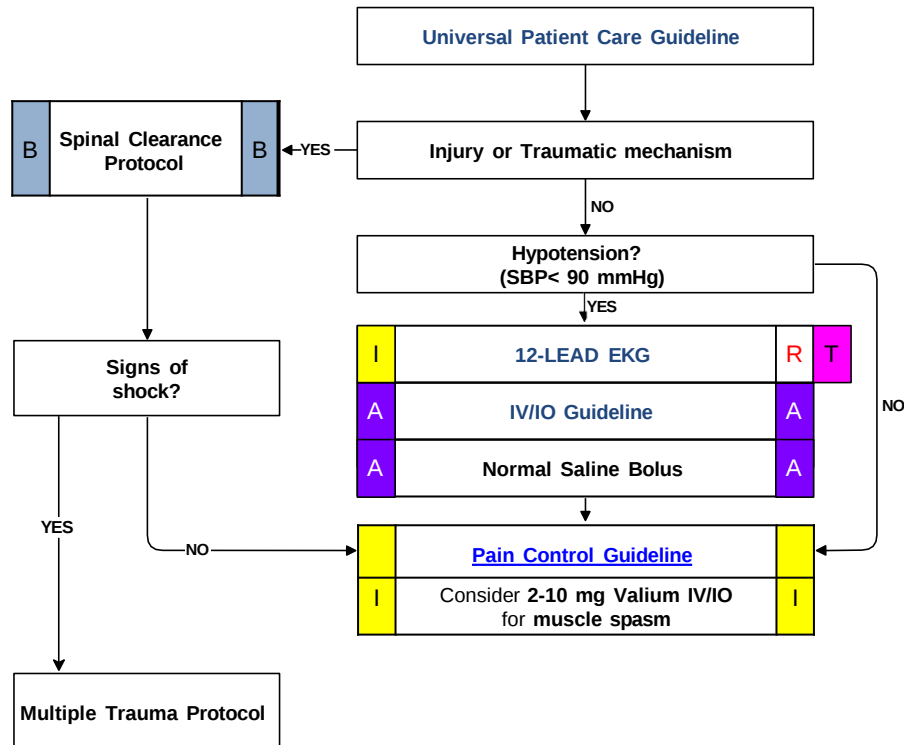
- Age
- Past medical history
- Past surgical history
- Medications
- Onset of pain / injury
- Previous back injury
- Traumatic mechanism
- Location of pain
- Fever
- Improvement or worsening with activity

Signs and Symptoms:

- Pain (paraspinous, spinous process)
- Swelling
- Pain with range of motion
- Extremity weakness
- Extremity numbness
- Shooting pain into an extremity
- Bowel / bladder dysfunction

Differential:

- Muscle spasm / strain
- Herniated disc with nerve compression
- Sciatica
- Spine fracture
- Kidney stone
- Pyelonephritis (Kidney infection)
- Aneurysm
- Pneumonia
- Cardiac related



Pearls:

Exam: Mental Status, HEENT, Neck, Chest, Lungs, Abdomen, Back, Extremities, Neurological

- Abdominal aneurysms are a concern in patients over the age of 50.
- Kidney stones typically present with an acute onset of flank pain which radiates around to the groin area.
- Patients with midline pain over the spinous processes should be spinally immobilized.
- Any bowel or bladder incontinence is a significant finding which requires immediate medical evaluation.

Behavioral/Agitated Delirium

History:

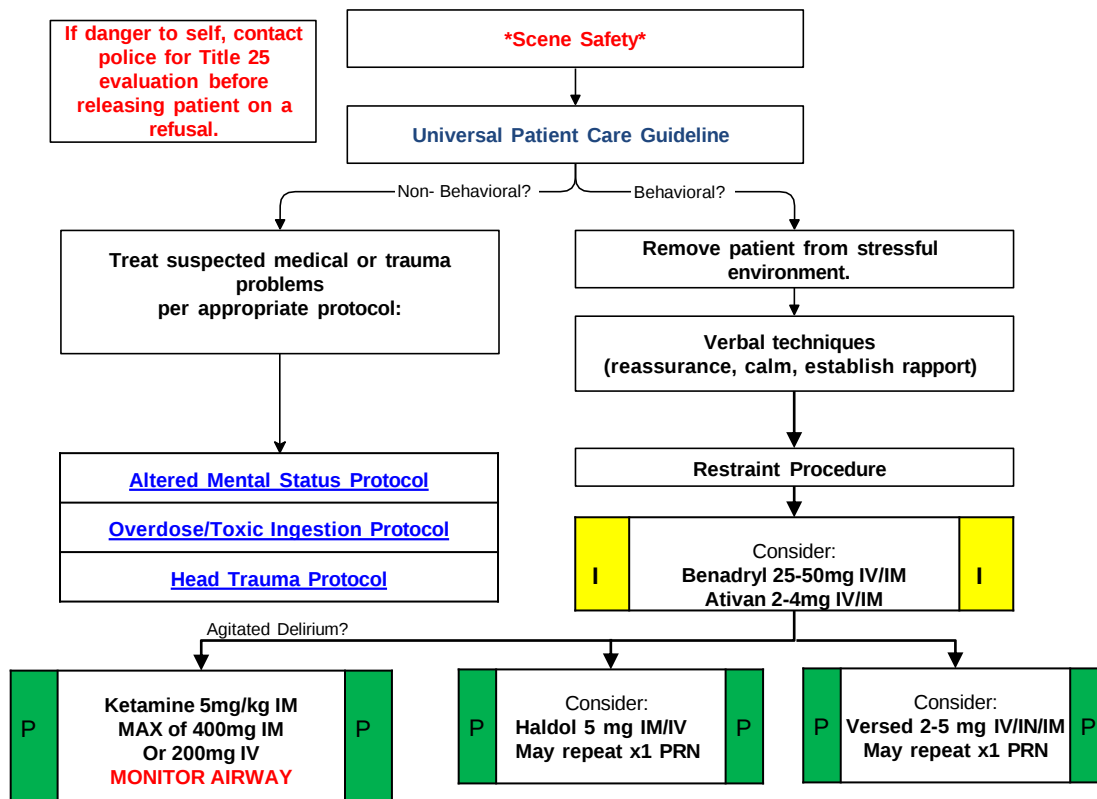
- Situational crisis
- Psychiatric illness/medications
- Injury to self or threats to others
- Medic alert tag
- Substance abuse / overdose
- Diabetes

Signs and 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



Pearls:

Exam: Mental Status, Skin, Heart, Lungs, Neurological

- Consider Haldol for patients with history of psychosis, Valium for patients with presumed substance abuse.
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, malignant hyperthermia, etc.).
- Do not overlook the possibility of associated domestic violence or child abuse.
- If patient suspected of agitated delirium suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early.
- All patients who receive either physical or chemical restraint must be continuously observed on a monitor by ACLS personnel on scene or immediately upon their arrival in the ED.
- IM Ketamine should not be given if available concentration does not allow it to be given safely.

Blood Transfusion-IFT

History:

- Trauma
- GI Bleed
- Chronic Anemia
- Cancer
- Pregnancy
- Surgery
- Age > 12

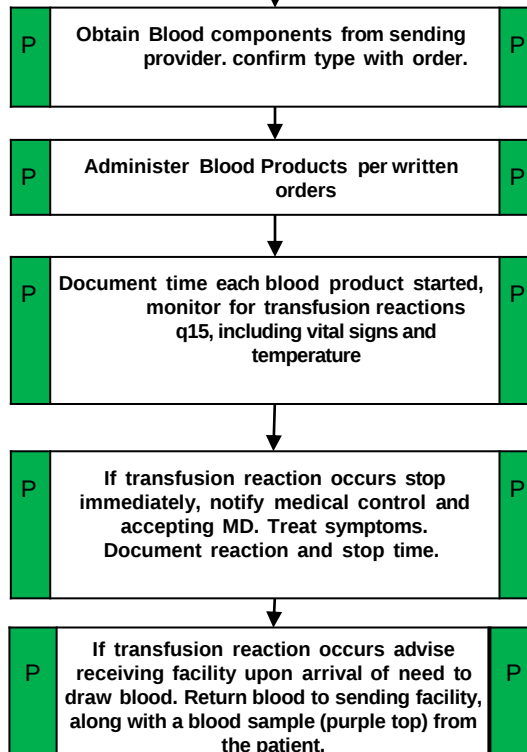
Signs and Symptoms:

- Significant loss of blood in a traumatic event
- Shortness of breath
- Grey Pallor
- Significant loss of blood from upper or lower GI bleed
- Significant loss of blood from vaginal bleeding

Differential:

- Dehydration
- Stress-related response
- Fluid dilution
- Sepsis

Obtain written or verbal order via sending doctor



Obtain temperature of patient and document Vital signs before departure from sending facility

Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- Consider using blood product over crystalloids in resuscitation
- Monitor for fluid overload, including pulmonary edema.
- Watch for transfusion reaction: fever, hives, hypotension, rigors and dyspnea. Stop infusion of blood when reaction is suspected. Administer 50 mg of benadryl IV and crystalloids IV as appropriate.
- Blood protocol is only for patients age > 12.
- Administering cooled blood products can contribute to hypothermia in patients. Utilize blood warmer.
- Document start and stop times for each unit of blood administered
- Attach paperwork obtained from lab to patient care report

Blood Transfusion Field

History:

- Trauma
- GI Bleed
- Chronic Anemia
- Cancer
- Pregnancy
- Surgery
- Age > 12

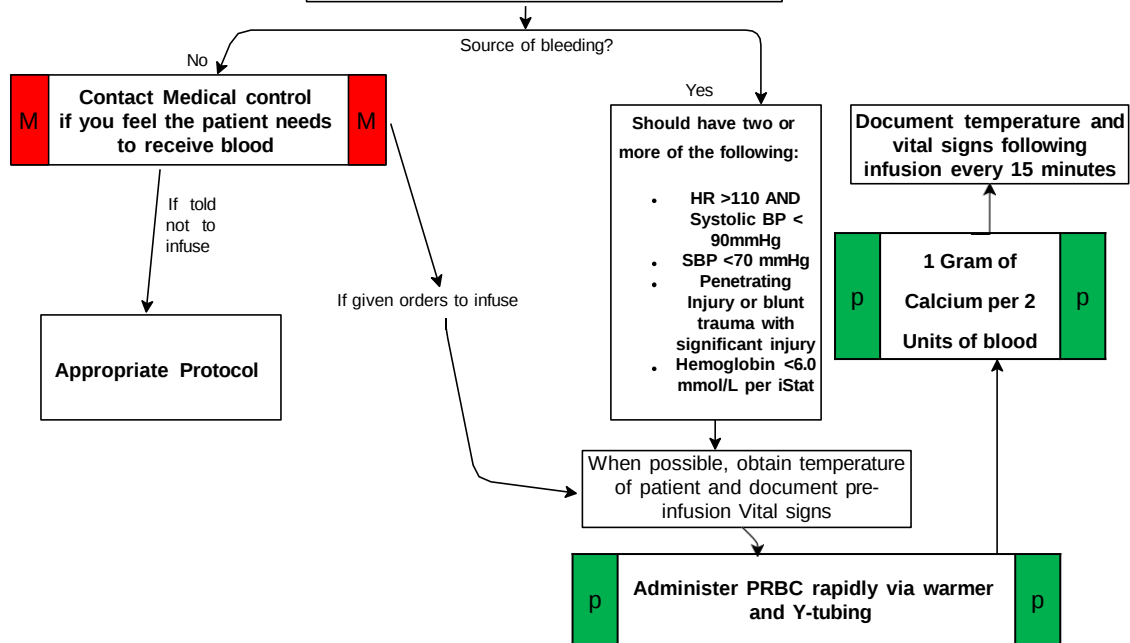
Signs and Symptoms:

- Significant loss of blood in a traumatic event
- Shortness of breath
- Grey Pallor
- Significant loss of blood from upper or lower GI bleed
- Significant loss of blood from vaginal bleeding
-

Differential:

- Dehydration
- Stress-related response
- Fluid dilution (with iStat results)
- Sepsis

Universal Patient Care Guideline



Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- Watch for transfusion reaction: fever, hives, hypotension, and dyspnea. Stop infusion of blood when reaction is suspected. Administer 50 mg of benadryl IV and crystalloids IV.
- Blood protocol is only for patients age > 12.
- Administering cooled blood products can contribute to hypothermia in patients. Utilize blood warmer. Document start and stop times for each unit of blood administered
- Attach paperwork obtained from lab to patient care report

Suspected Stroke/CVA

History:

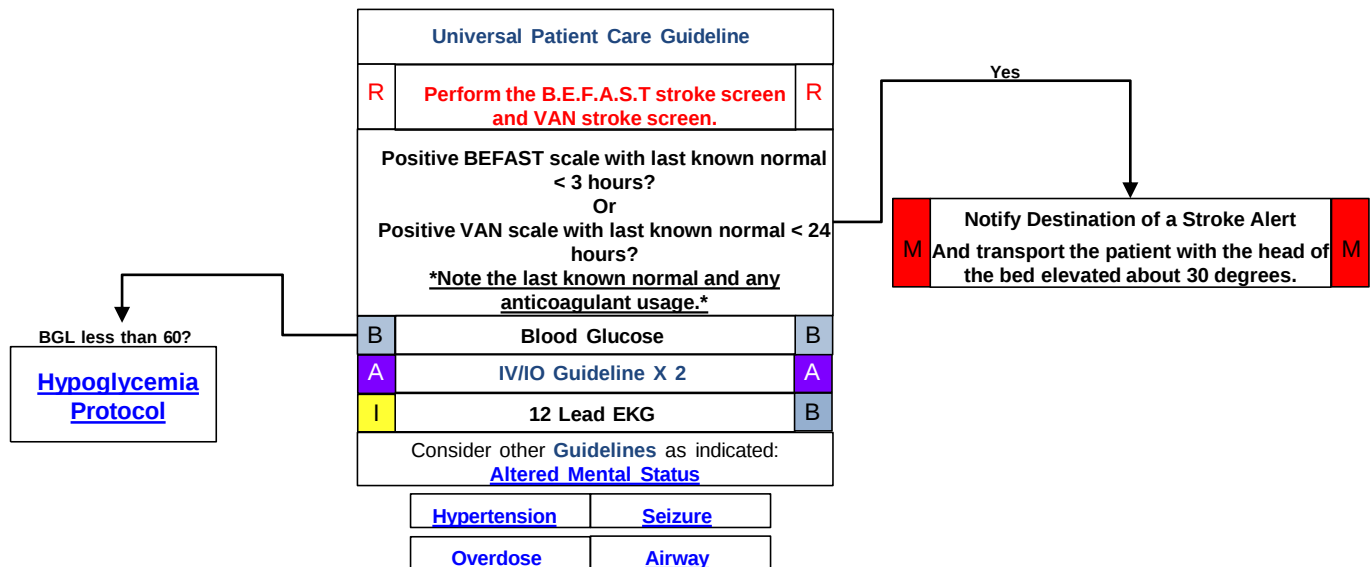
- Previous CVA and/or TIA
- Previous cardiac / vascular surgery
- Associated diseases: diabetes, hypertension, CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma

Signs and Symptoms:

- Altered mental status
- Weakness / Paralysis
- Blindness or other sensory loss
- Aphasia / Dysarthria
- Syncope
- Vertigo / Dizziness
- Vomiting
- Headache
- Seizures
- Respiratory pattern change
- Hypertension / hypotension

Differential:

- Altered Mental Status
- TIA (Transient ischemic attack)
- Seizure
- Hypoglycemia
- Stroke (Thrombotic or Embolic; hemorrhagic only 15% of time)
- Tumor
- Trauma
- Migraine



Pearls:

Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Neurological

- **BE FAST stroke exam should be used: Balance disturbances, Vision disturbances, Facial drooping, Arm drift, leg drift, Speech disturbances.**
- **With a duration of symptoms of less than 3 hours, scene times and transport times should be appropriate. Consider delay of procedures such as IV initiation until transport is under way.**
- Onset of symptoms is defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom free).
- Whenever possible a family member should accompany patient to hospital to provide additional history and/or consent. If this is not possible, attempt to obtain a phone number for further contact
- The differential 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 neurologic deficit, especially in the elderly.
- If a patient presents with stroke-like symptoms and is found to be hypoglycemic, titrate dextrose administration to a blood sugar of 80-100 until it is determined if the stroke symptoms remain.
- Document the evaluation using the "Stroke Screen" procedure in the call reporting system..

Drowning / Near Drowning

History:

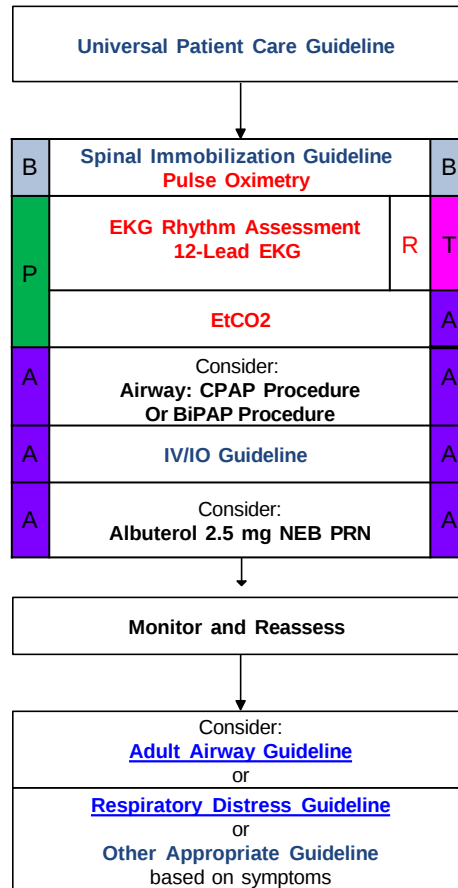
- Submersion in water regardless of depth
- Possible history of trauma ie: diving board
- Duration of immersion
- Temperature of water
- Fresh/Salt Water

Signs and Symptoms:

- Unresponsive
- Mental status changes
- Decreased or absent vital signs
- Vomiting
- Coughing

Differential:

- Trauma
- Pre-existing medical problem
- Pressure injury (diving)
- Barotrauma
- Decompression sickness



Pearls:

Exam: Trauma Survey, Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neurological

- Resuscitate ALL cold water drownings. These patients have an increased chance of survival.
- 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 and certified rescuers to remove victims from areas of danger.
- With pressure injuries (decompression / barotrauma), consider transport or availability of a hyperbaric chamber (Cody Regional Health, Billings Clinic Hospital, Cheyenne Regional Medical Center, Fort Collins Hospital).

Fever/Infection Control

History:

- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Environmental exposure
- Last acetaminophen or ibuprofen

Signs and Symptoms:

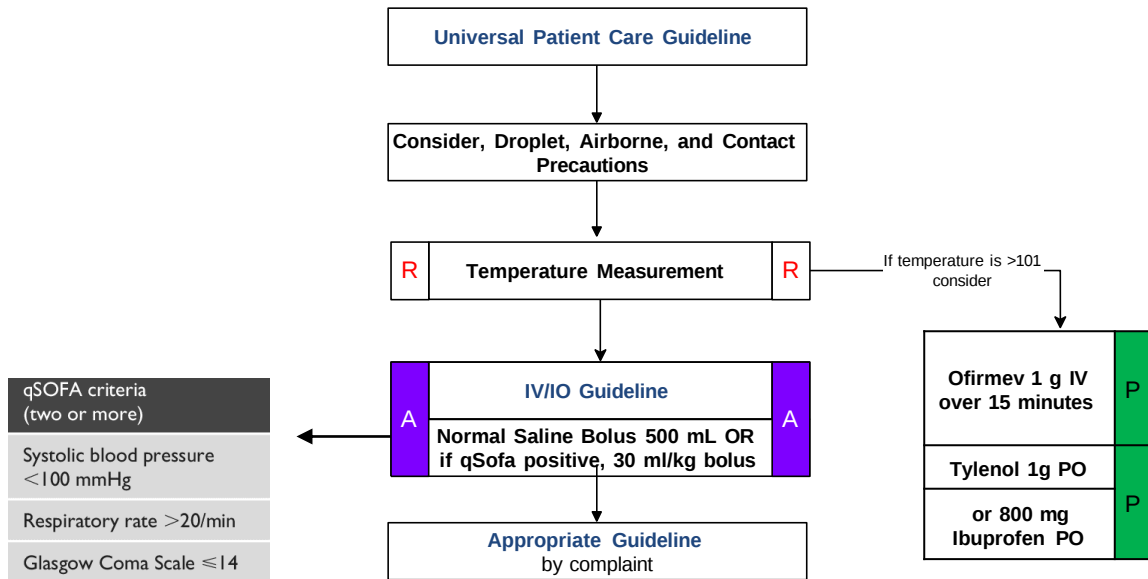
- Warm
- Flushed
- Sweaty
- Chills/Rigors

Associated Symptoms: (Helpful to localize source)

- Myalgias
- Cough
- Chest pain
- Headache
- Dysuria
- Abdominal pain
- Mental status changes
- Rash
- Stiff neck

Differential:

- Infections / Sepsis
- Cancer / Tumors / Lymphomas
- Medication or drug reaction
- Connective tissue disease
- Arthritis
- Vasculitis
- Hyperthyroid
- Heat Stroke
- Meningitis



qSOFA criteria (two or more)

Systolic blood pressure
<100 mmHg

Respiratory rate >20/min

Glasgow Coma Scale ≤14

Pearls:

Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neurological

- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- **Droplet precautions** include: standard PPE plus a standard surgical mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when influenza, meningitis, mumps, streptococcal pharyngitis, and other illnesses spread via large particle droplets are suspected.
- **Airborne precautions** include: standard PPE plus an N-95 mask for providers who accompany patients in the back of the ambulance and a surgical mask or NRB O2 mask for the patient. This level of precaution should be utilized when tuberculosis, measles, varicella, or other infections that are spread by droplet nuclei are suspected.
- **Contact precautions** include: standard PPE plus utilization of a gown, change of gloves after every patient contact, and strict hand washing precautions. This level of precaution is utilized when multi-drug resistant organisms (e.g., MRSA), scabies, or zoster (shingles), or other illnesses spread by contact are suspected.
- **All-hazards precautions** include: standard PPE plus airborne precautions plus contact precautions. This level of precaution is utilized during the initial phases of an outbreak when the etiology of the infection is unknown or when the causative agent is found to be highly contagious (e.g, SARS).

Hyperglycemia

History:

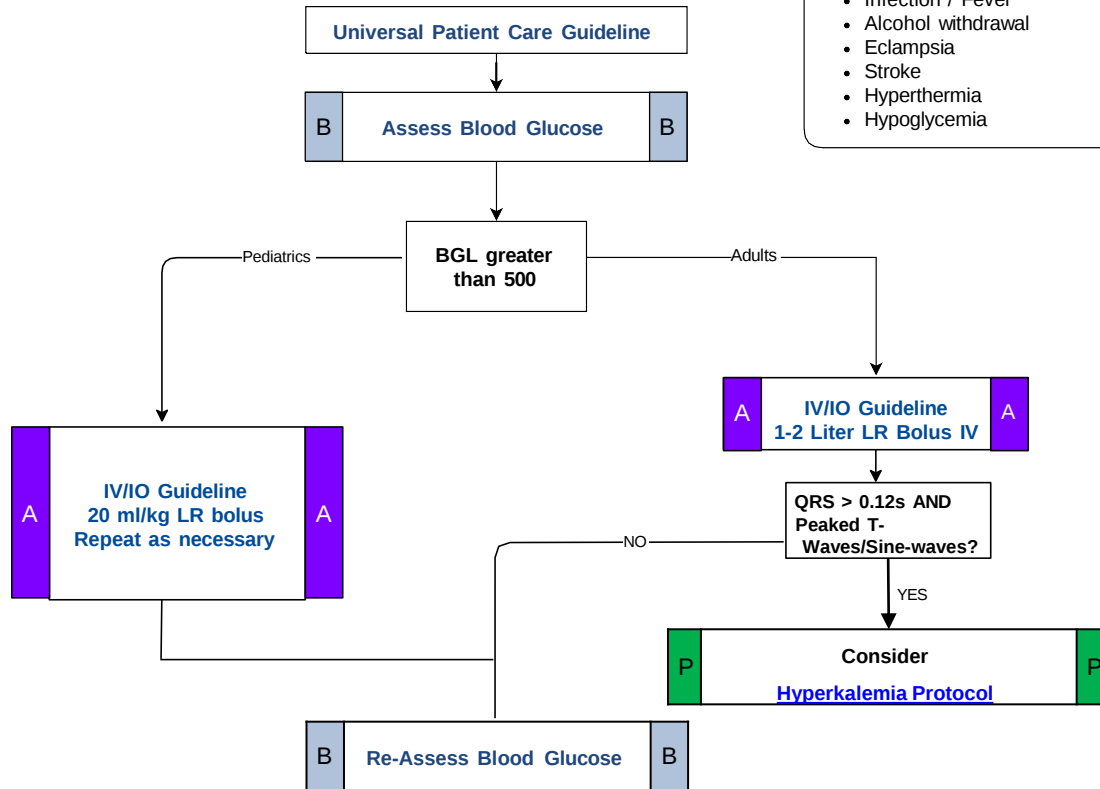
- Diabetes Type 1 or Type 2
 - Not taking medications appropriately
 - Illness
 - Inactivity
- Thyroid Disease

Signs and Symptoms:

- Decreased mental status
- Coma
- Increased Thirst
- Polyuria
- Blurred Vision
- Trouble concentrating
- Fast Breathing (Kussmaul's)
- Fruity (Katabatic) Breath

Differential:

- CNS (Head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia



Pearls:

Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neurological

- Tachypnea is normal and is a compensatory mechanism, **avoid correcting the patient's breathing rate.**
- Avoid intubation if possible. If necessary prepare to have a increased minute ventilation.
- End-tidal CO2 monitoring is required on potential DKA patients.
- Nausea, vomiting, and abdominal pain are common with DKA patients.

Hypoglycemia

History:

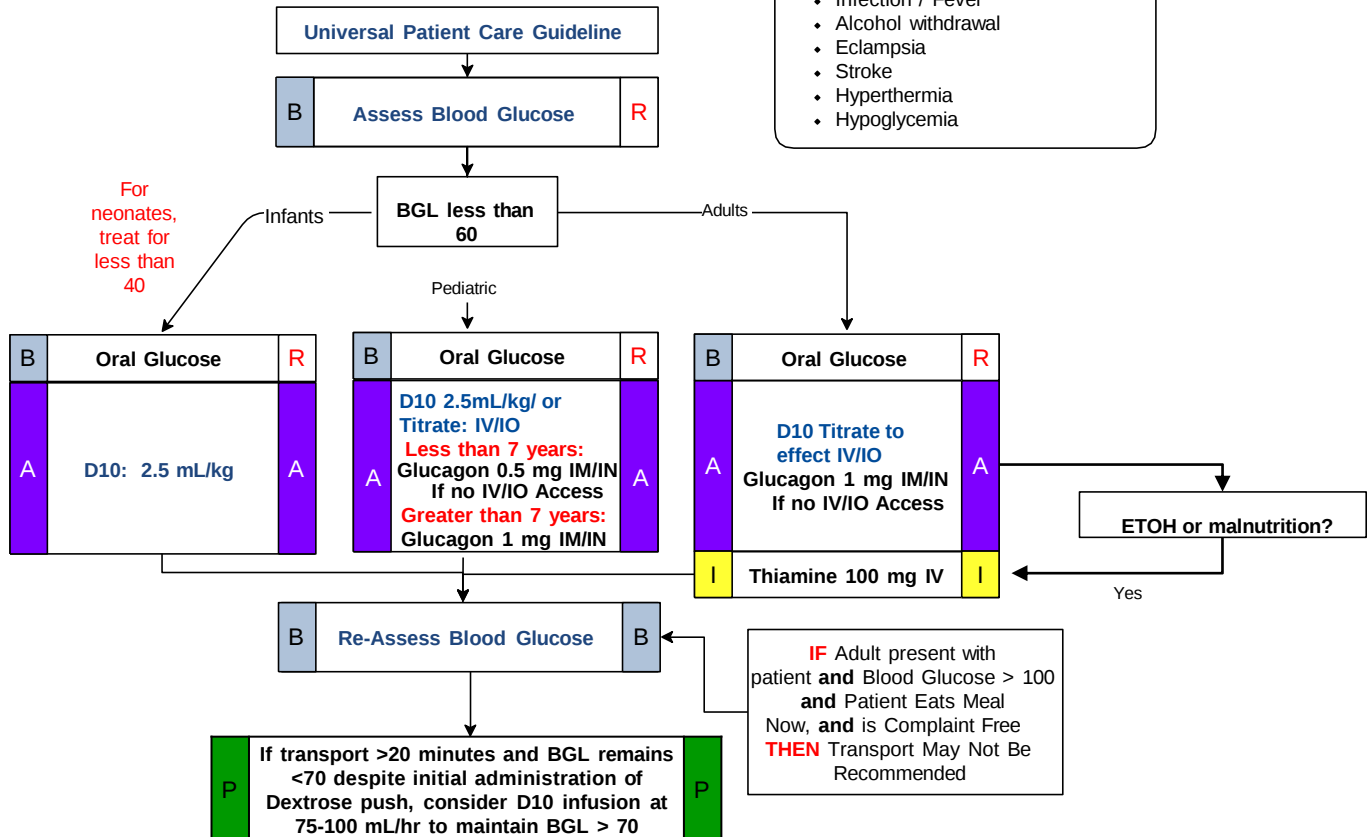
- Diabetes Type 1 or Type 2
- Malnourished
- Alcoholism
- Prolonged strenuous activity

Signs and Symptoms:

- Decreased mental status
- Sleepiness
- Unable to follow commands
- Unable to speak appropriately
- Unconscious

Differential:

- CNS (Head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia



Pearls:

Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neurological

- Consider giving oral glucose rectally when necessary.
- Retake the blood glucose approximately 5 minutes after administration of dextrose.
- Ensure patient can eat and drink normally, including encouraging protein intake.
- If altered mental status does not improve, consider other differentials as cause.
- Patient must be alert to have oral glucose, otherwise you must continue on down the algorithm.
- Beware that insulin overdoses can happen and will require multiple administrations of dextrose to manage. This will need to be taken to the hospital.
- Patients may refuse after a dextrose administration, but they must be alert and oriented x 4 with a GCS of 15. They should also exhibit to you that they can eat properly and have no remaining deficits.

Hyperthermia

History:

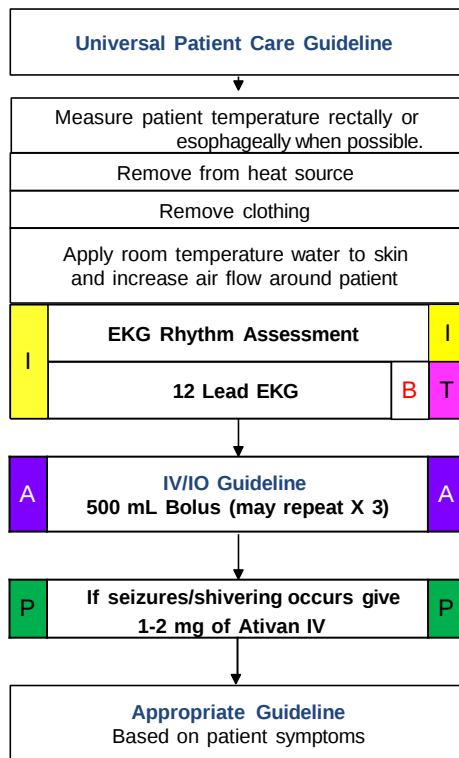
- Age
- Exposure to increased temperatures and / or humidity
- Past medical history / medications
- Extreme exertion
- Time and length of exposure
- Poor PO intake
- Fatigue and / or muscle cramping

Signs and Symptoms:

- Altered mental status or unconsciousness
- Hot, dry, or sweaty skin
- Hypotension or shock
- Seizures
- Nausea

Differential:

- Fever (Infection)
- Dehydration
- Medications
- Hyperthyroidism (Storm)
- Delirium tremens (DT's)
- Heat cramps
- Heat exhaustion
- Heat stroke
- CNS lesions or tumors



Pearls:

Exam: Mental Status, Skin, HEENT, Heart, Lungs, Neurological

- Extremes of age are more prone to heat emergencies (i.e. young and old).
- Predisposed by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- **Cocaine, Amphetamines, and Salicylates may elevate body temperatures.**
- **Malignant Hyperthermia use Valium 2-10 mg to manage condition.**
- Sweating generally disappears as body temperature rises above 104°F (40°C).
- Intense shivering may occur as patient is cooled.
- **Heat Cramps** consists of: benign muscle cramping secondary to dehydration and is not associated with an elevated temperature.
- **Heat Exhaustion** consists of: dehydration, salt depletion, dizziness, fever, weakness, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consist of tachycardia, hypotension, and an elevated temperature.
- **Heat Stroke** consists of: dehydration, tachycardia, hypotension, temperature >104°F (40°C), and an **altered mental status** with exposure to a heated environment.

Hypothermia

History:

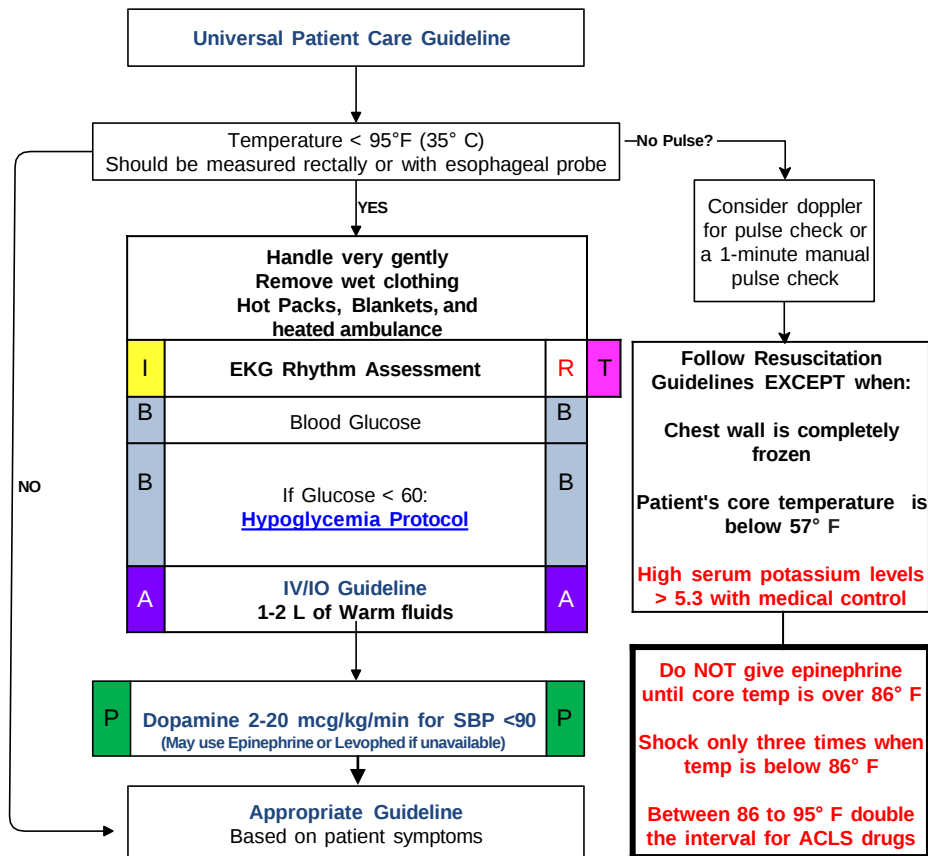
- Past medical history
- Medications
- Exposure to environment even in normal temperatures
- Exposure to extreme cold
- Extremes of age
- Drug use: Alcohol, barbituates
- Infections / Sepsis
- Length of exposure / Wetness

Signs and Symptoms:

- Cold, clammy
- Shivering
- Mental status changes
- Extremity pain or sensory abnormality
- Bradycardia
- Hypotension or shock

Differential:

- Sepsis
- Environmental exposure
- Hypoglycemia
- CNS dysfunction
 - Stroke
 - Head injury
 - Spinal cord injury



Pearls:

Exam: Mental Status, Heart, Lungs, Abdomen, Extremities, Neurological

NO PATIENT IS DEAD UNTIL WARM AND DEAD = 32°C (89.6°F)

Consider transport to a facility with ECMO for best outcomes.

Extremes of age are more susceptible (i.e. young and old).

With temperature less than 31°C (88°F) Ventricular Fibrillation is common cause of death. Handling patients gently may prevent this (rarely responds to defibrillation).

Onset of medications may be delayed due to poor peripheral perfusion.

If the temperature is unable to be measured, treat the patient based on the suspected temperature.

Hypothermia may produce severe bradycardia.

Shivering stops below 32°C (90°F).

Hypertension

History:

- Documented hypertension
- Related diseases: diabetes, CVA renal failure, cardiac
- Medications (compliance?)
- Viagra, Levitra, Cialis
- Pregnancy

Signs and Symptoms:

One of these:

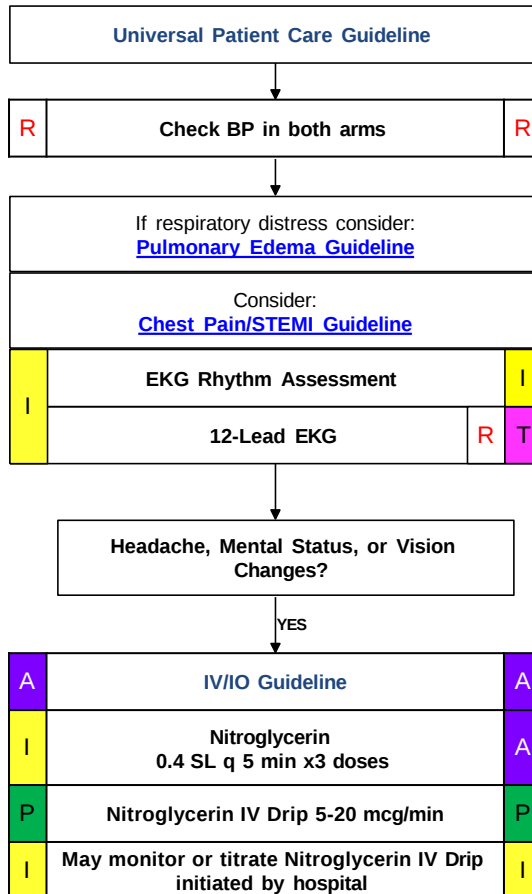
- Systolic BP 200 or greater
- Diastolic BP 110 or greater without symptoms of Stroke/CVA

AND at least one of these:

- Headache
- Nosebleed
- Blurred vision
- Dizziness

Differential:

- Hypertensive encephalopathy
- Primary CNS Injury
 - (Cushing's response =bradycardia with hypertension)
- Myocardial infarction
- Aortic dissection (aneurysm)
- Pre-ecampsia / Eclampsia



Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- Never treat elevated blood pressure based on one set of vital signs.
- Symptomatic hypertension is typically revealed through end organ damage to the cardiac, CNS or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated.
- Nitroglycerin may be given to lower blood pressure in patients who have an elevated diastolic BP of > 110 and are symptomatic with chest pain, respiratory distress, syncope, headache or mental status changes.
- **Avoid Nitroglycerin in any patient who has used Viagra or Levitra in the past 24 hours or Cialis in the past 36 hours due to potential severe hypotension.**

Hypotension/Shock (Non-Trauma)

History:

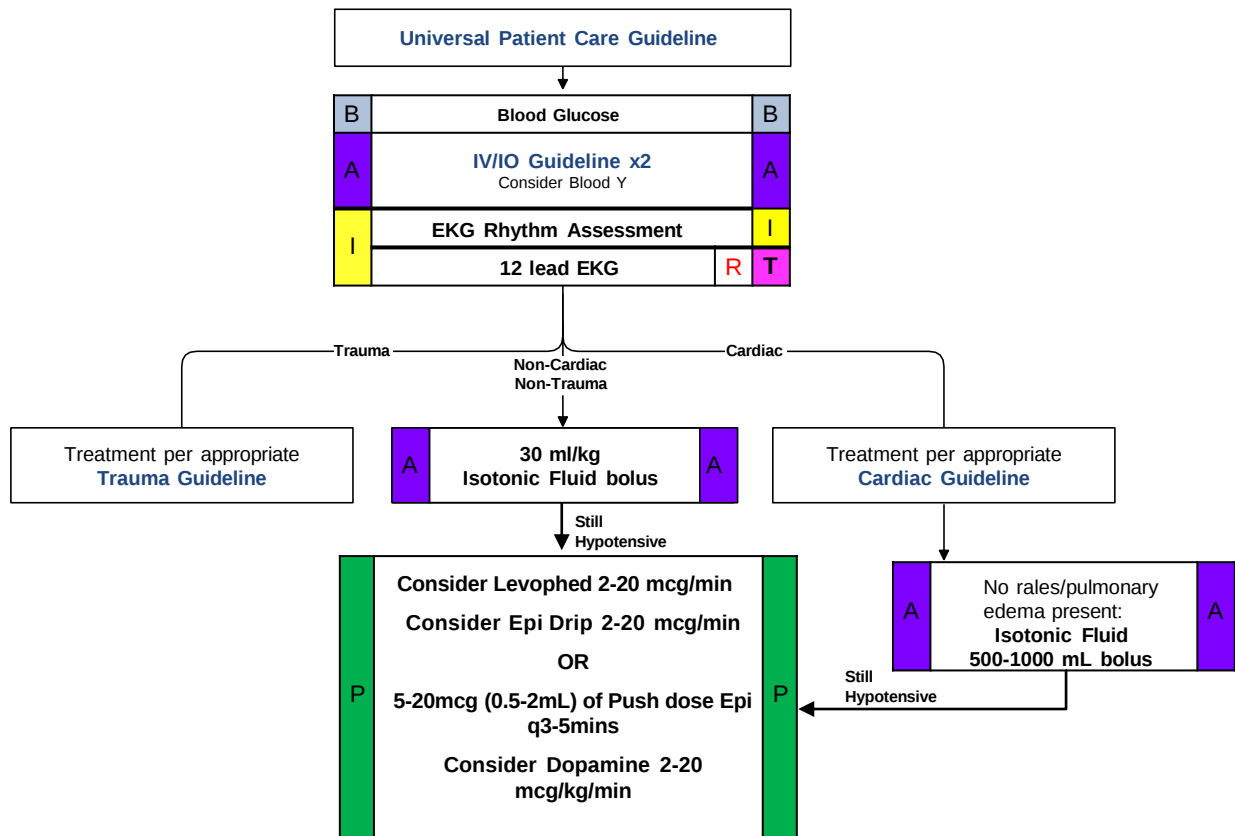
- Blood loss - vaginal or gastrointestinal bleeding, AAA, ectopic
- Fluid loss - vomiting, diarrhea, fever
- Infection
- Cardiac ischemia (MI, CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

Signs and Symptoms:

- Restlessness, confusion
- Weakness, dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Hypotension
- Coffee-ground emesis
- Obvious bleeding/Tarry stools

Differential:

- Shock
 - Hypovolemic
 - Cardiogenic
 - Septic
 - Neurogenic
 - Anaphylactic
- Ectopic pregnancy
- Dysrhythmias
- Pulmonary embolus
- Tension pneumothorax
- Medication effect / overdose
- Vasovagal
- Physiologic (pregnancy)



Pearls:

Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neurological

- Reassess lung sounds frequently for possible fluid overload in Cardiac shock patients
- Hypotension can be defined as a systolic blood pressure of less than 90 mmHg.
- Consider performing orthostatic vital signs on patients in non-trauma situations if suspected blood or fluid loss.
- Consider all possible causes of shock and treat per appropriate protocol.

Hyperkalemia

History:

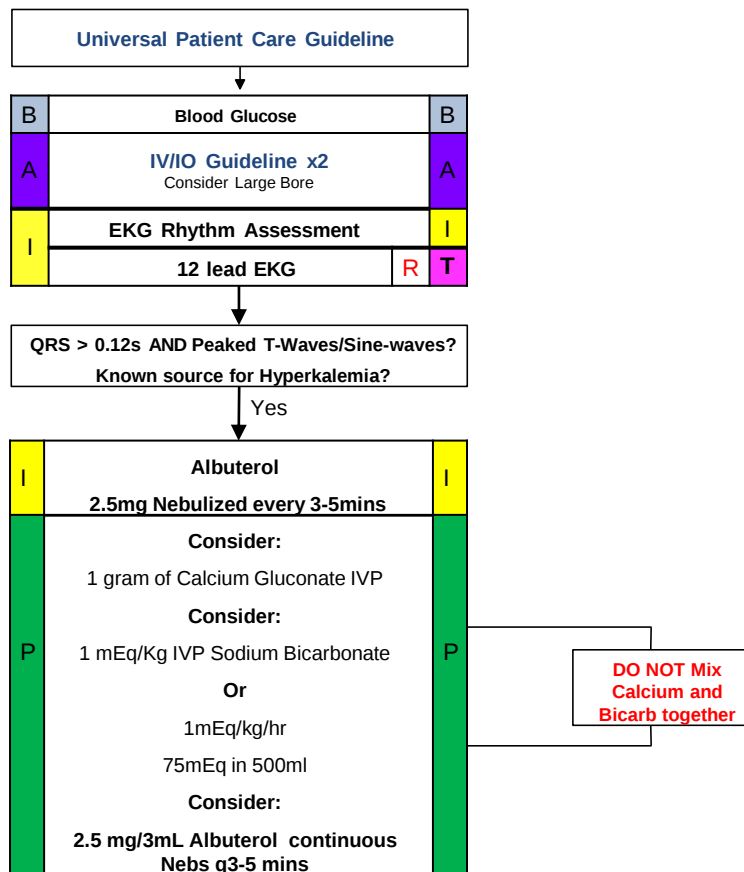
- Known History of Hyperkalemia
- Acute/Chronic Kidney Injury and disease
- Renal Failure
- Dialysis
- Hyperglycemia
- Crush Injuries
- Burns

Signs and Symptoms:

- Muscle weakness/paralysis
- Cardiac arrhythmias or palpitations
- Fatigue/generalized weakness
- Numbness or tingling in extremities
- Nausea or vomiting

Differential:

- Chronic kidney disease or renal failure
- Adrenal insufficiency
- Tumor lysis syndrome
- Acidosis (e.g., diabetic ketoacidosis)
- Medication side effects (e.g., potassium-sparing diuretics)



Pearls:

- Patients with severe hyperkalemia may experience cardiac conduction abnormalities such as sinus bradycardia, sinus arrest, idioventricular rhythms, or V-Tach/V-Fib.
- Calcium and Bicarbonate should not be given together in the same IV line, if not possible, thoroughly flush (50-100mL) the IV between medications.

Obstetric Emergency

History:

- Past medical history
- Hypertension meds
- Prenatal care
- Prior pregnancies / births
- Gravida / Para / Abortus

Signs and Symptoms:

- Vaginal bleeding
- Abdominal pain
- Seizures
- Hypertension
- Severe headache
- Visual changes
- Edema of hands and face

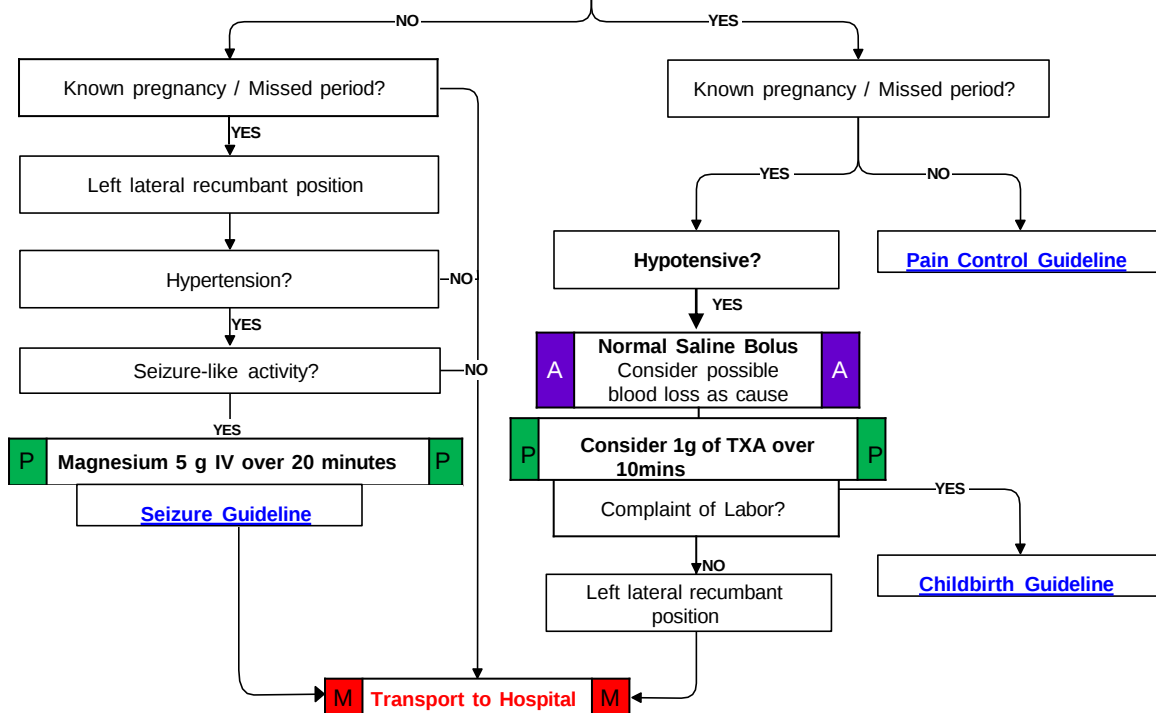
Differential:

- Pre-eclampsia / Eclampsia
- Placenta previa
- Placenta abruptio
- Spontaneous abortion

Universal Patient Care Guideline

IV/IO Guideline

Vaginal bleeding / Abdominal pain ?



Pearls:

Exam: Mental Status, Abdomen, Heart, Lungs , Neurological

- Severe headache, vision changes, or RUQ pain may indicate preeclampsia.
- In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Maintain patient in a left lateral position to minimize risk of supine hypotensive syndrome.
- Ask patient to quantify bleeding - number of saturated pads used per hour.
- Any pregnant patient involved in a MVC should be seen immediately by a physician for evaluation and fetal monitoring.
- Magnesium may cause hypotension and decreased respiratory drive. (4 grams in 250 mL NS over 20 min).

Overdose/Toxic Ingestion

History:

- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

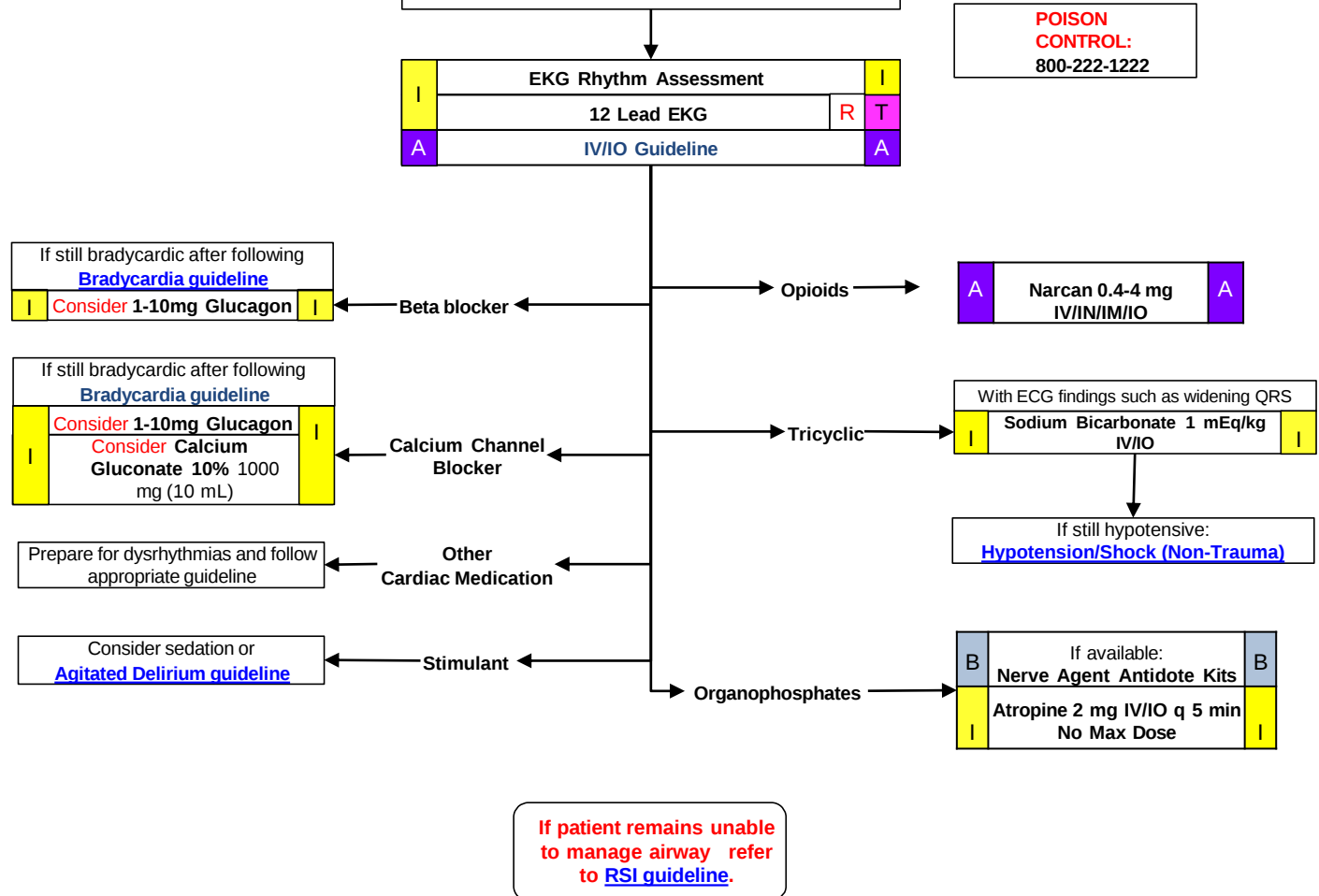
Signs and Symptoms:

- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures

Differential:

- Tricyclic antidepressants (TCAs)
- Acetaminophen (tylenol)
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)

Universal Patient Care Guideline



Pearls:

Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Extremities, Neurological

- Do not rely on patient history of ingestion, especially in suicide attempts.
 - Bring bottles, contents, emesis to ED.
 - **Tricyclic:** 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
 - **Acetaminophen:** initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure.
 - **Depressants:** decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils.
 - **Stimulants:** increased HR, increased BP, increased temperature, dilated pupils, seizures.
 - **Anticholinergic:** increased HR, increased temperature, dilated pupils, mental status changes.
 - **Cardiac Meds:** dysrhythmias and mental status changes.
 - **Solvents/Inhalants:** nausea, vomiting, and mental status changes.
 - **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
 - Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
 - **MARK 1 kits** contain 2 mg of Atropine and 600 mg of pralidoxime in an autoinjector for self administration or patient care. These kits may be available as part of the domestic preparedness for Weapons of Mass Destruction.
 - Consider contacting the Poison Control Center for guidance.
- When dialing poison control, it will connect you to the same state that your area-code/phone number is from. (i.e #406 = Montana poison control)

Pain Control: Adult

History:

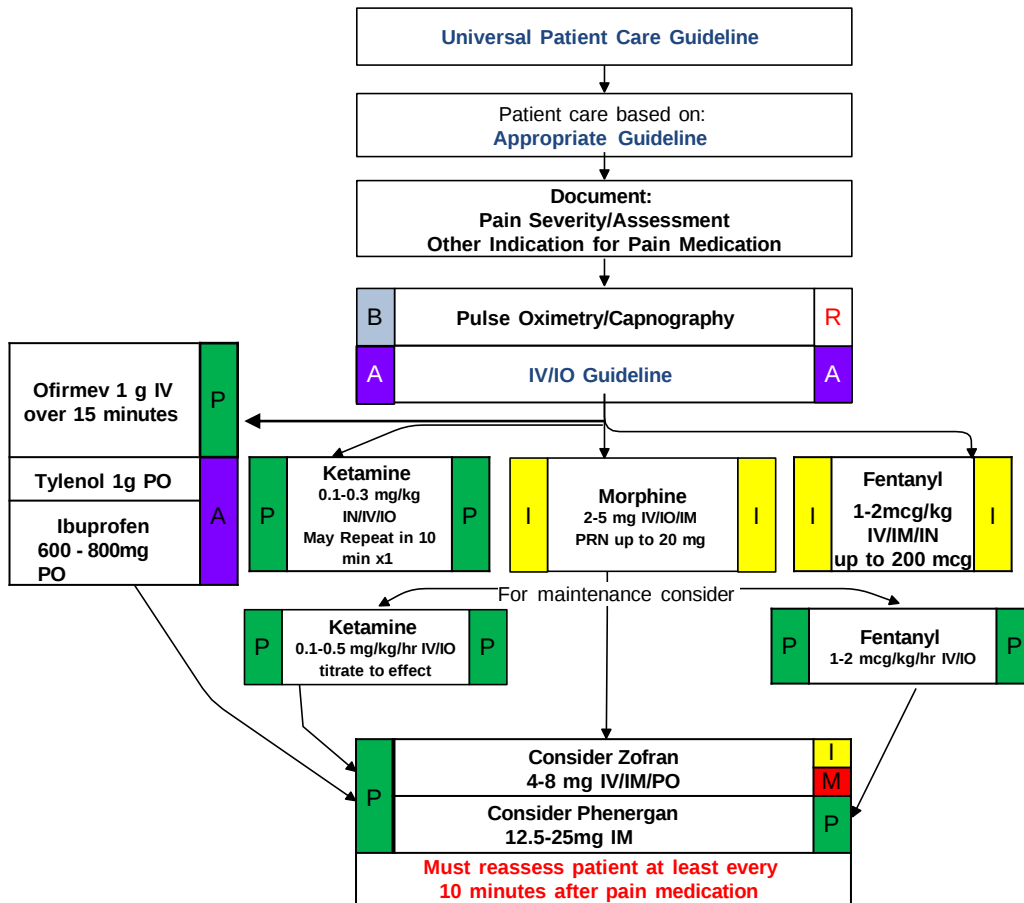
- Age
- Location
- Duration
- Severity (0 - 10)
- Past medical history
- Medications
- Drug allergies

Signs and Symptoms:

- Severity (pain scale)
- Quality (sharp, dull, etc.)
- Radiation
- Relation to movement, respiration
- Increased with palpation of area

Differential:

- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)


Pearls:

- **Pain severity (0-10) is a vital sign to be recorded pre and post medication delivery and at disposition.**
- Vital signs should be obtained pre, 10 minutes post, and at disposition with all pain medications. Precautions to **opioids** use include hypotension, altered mental status, head injury, respiratory compromise. Use Ketamine with caution with psychiatric disorders.
- All patients should have drug allergies documented prior to administering pain medications.
- All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- **Consider** pain medications for the initial movement, consider addition of **Morphine** as longer acting narcotic.

Police Custody

History:

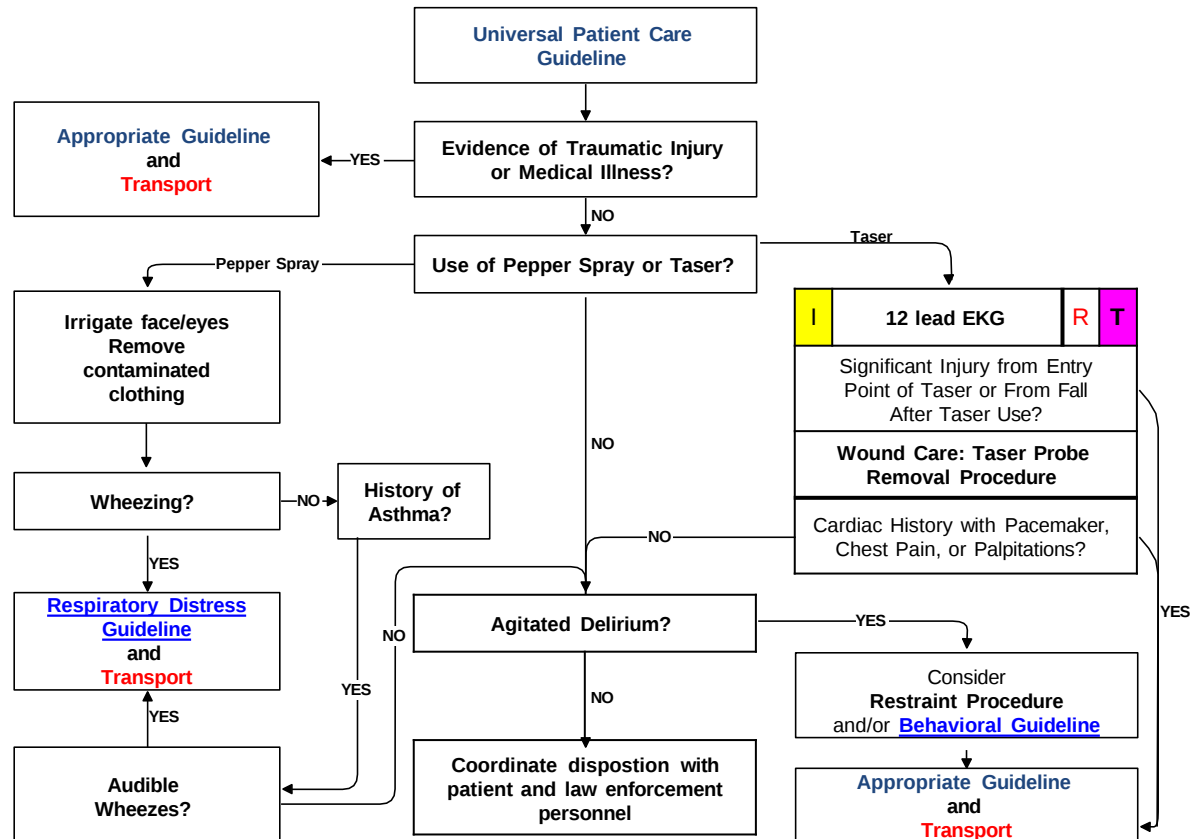
- Traumatic injury
- Drug Abuse
- Cardiac History
- History of Asthma
- Psychiatric History

Signs and Symptoms:

- External signs of trauma
- Palpitations
- Shortness of breath
- Wheezing
- Altered Mental Status
- Intoxication/Substance Abuse

Differential:

- Agitated Delirium Secondary to Psychiatric Illness
- Agitated Delirium Secondary to Substance Abuse
- Traumatic Injury
- Closed Head Injury
- Asthma Exacerbation
- Cardiac Dysrhythmia



Pearls:

- Agitated delirium is characterized by marked restlessness, irritability, and/or high fever. Patients exhibiting these signs are at high risk for sudden death and should be transported to hospital by ALS personnel.
- **Patients restrained by law enforcement devices cannot be transported in the ambulance without a law enforcement officer in the patient compartment or following behind who is capable of removing the devices.**
- If there is any doubt about the cause of a patient's alteration in mental status, transport the patient to the hospital for evaluation.
- If an asthmatic patient is treated with pepper spray and released to law enforcement, all parties should be advised to immediately contact EMS if wheezing/difficulty breathing occurs.
- All patients in police custody retain the right to request transport. This should be coordinated with law enforcement.
- **Restrained patients are NEVER to be transported in the prone position.**

Seizure

History:

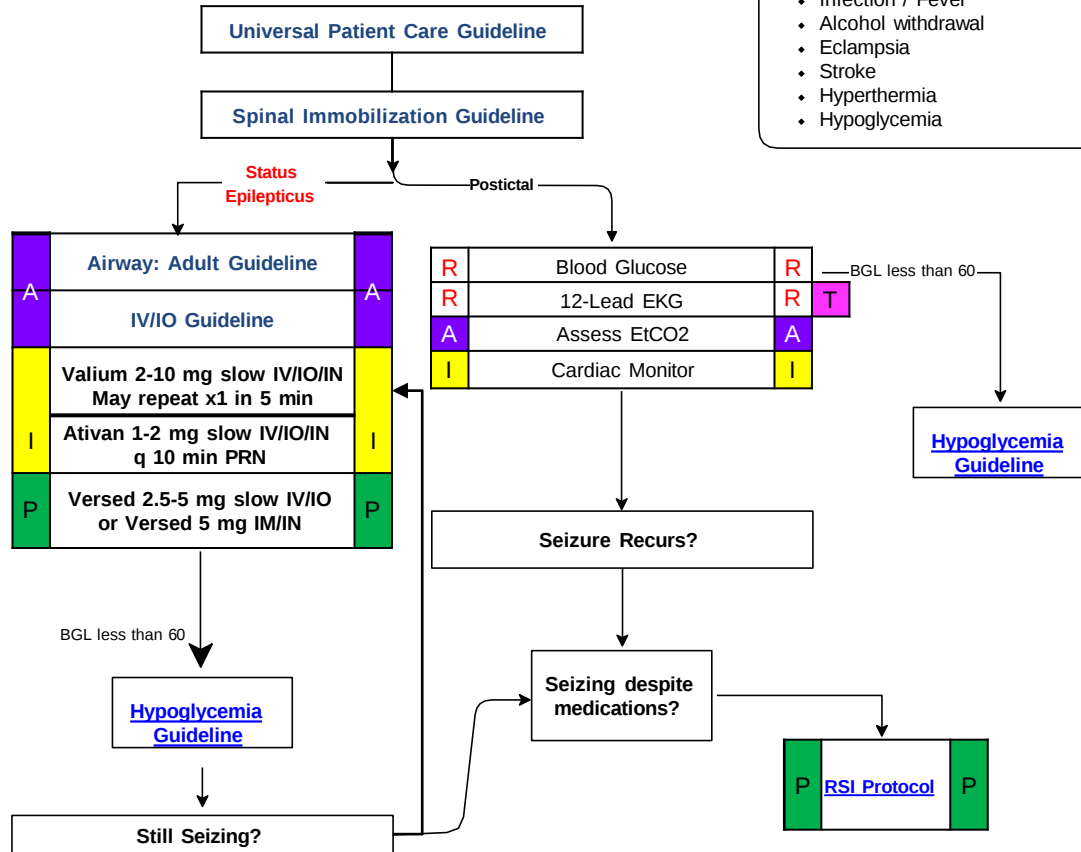
- Reported / witnessed seizure activity
- Previous seizure history
- Medical alert tag information
- Seizure medications
- History of trauma
- History of diabetes
- History of pregnancy

Signs and Symptoms:

- Decreased mental status
- Sleepiness
- Incontinence
- Observed seizure activity
- Evidence of trauma
- Unconscious

Differential:

- CNS (Head) trauma
- Tumor
- Metabolic, Hepatic, or Renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs, Medications, Non-compliance
- Infection / Fever
- Alcohol withdrawal
- Eclampsia
- Stroke
- Hyperthermia
- Hypoglycemia



Pearls:

Exam: Mental Status, HEENT, Heart, Lungs, Extremities, Neurological

- **Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery or a seizure lasting longer than five minutes. . 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
- Jacksonian seizures are seizures which start as a focal seizure and become generalized.
- Be prepared for airway problems and continued seizures.
- Assess possibility of occult trauma and substance abuse.
- Be prepared to assist ventilations.

For any **Seizure** in a **Third Trimester pregnant patient**, follow the **OB Emergencies Protocol**.

Sepsis

History:

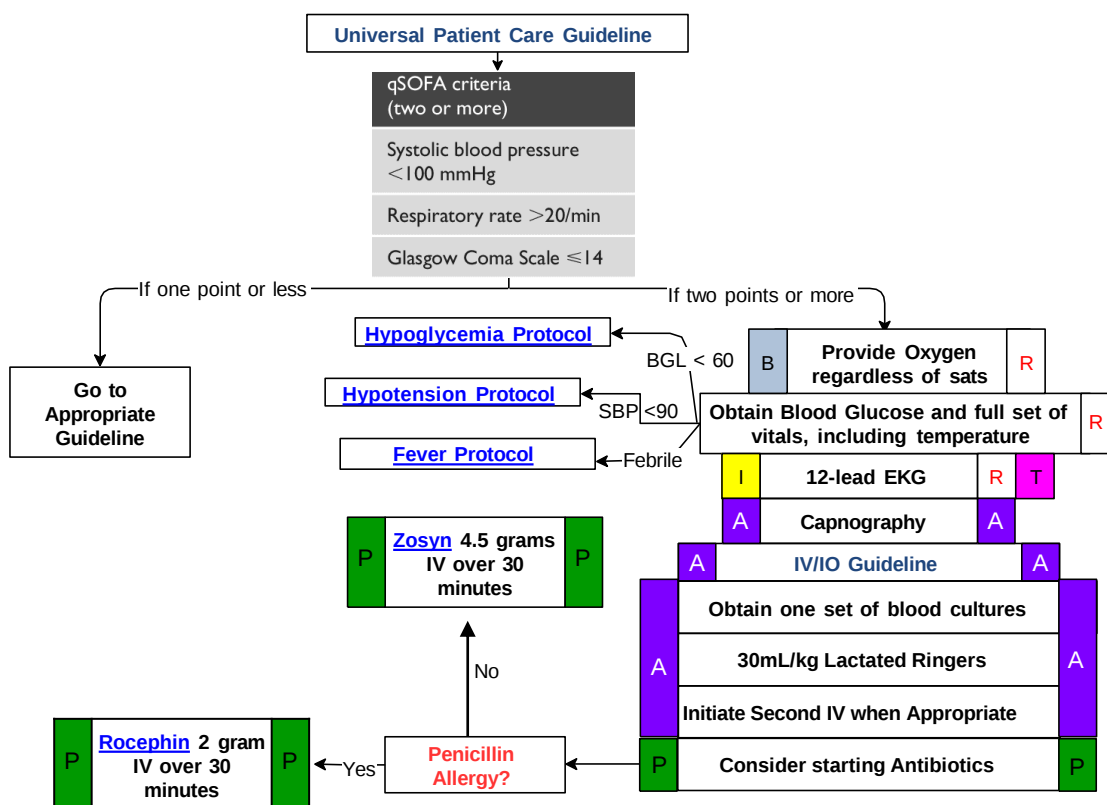
- Age > 18 years
- Duration and severity of fever
- Altered mental status
- Past medical history
- Medications
- Immunocompromised
 - Transplant
 - HIV
 - Diabetes
 - Cancer
- Environmental Exposure
- Last NSAID or Acetaminophen usage

Signs/Symptoms:

- Hyperthermia (>100.4°F or 38°C)
- Hypothermia (<95°F or 35°C)
- Tachypnea
- Tachycardia
- Acute mental status change
- Urinary tract infection
- Cough
- Erythema/swelling
- Abdominal Pain
- Wound drainage
- Headache/stiff neck

Differential:

- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Thyroid (hyper / hypo)
- Shock (metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicologic
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality



Pearls:

- If unable to obtain cultures, do not administer antibiotics.
- A lactate sample should be drawn before all fluid administration (Advanced & Intermediates can provide to hospital upon arrival).
- Be alert for allergic reaction during antibiotic administration
- Extended scene times to provide antibiotics are acceptable
- Rocephin is preferred in suspected pneumonia, meningitis, skin/soft tissue, and urinary sources of sepsis.
- Zosyn is preferred if suspected intra-abdominal, chronic wounds, recent hospitalization, or osteomyelitis.

Syncope

History:

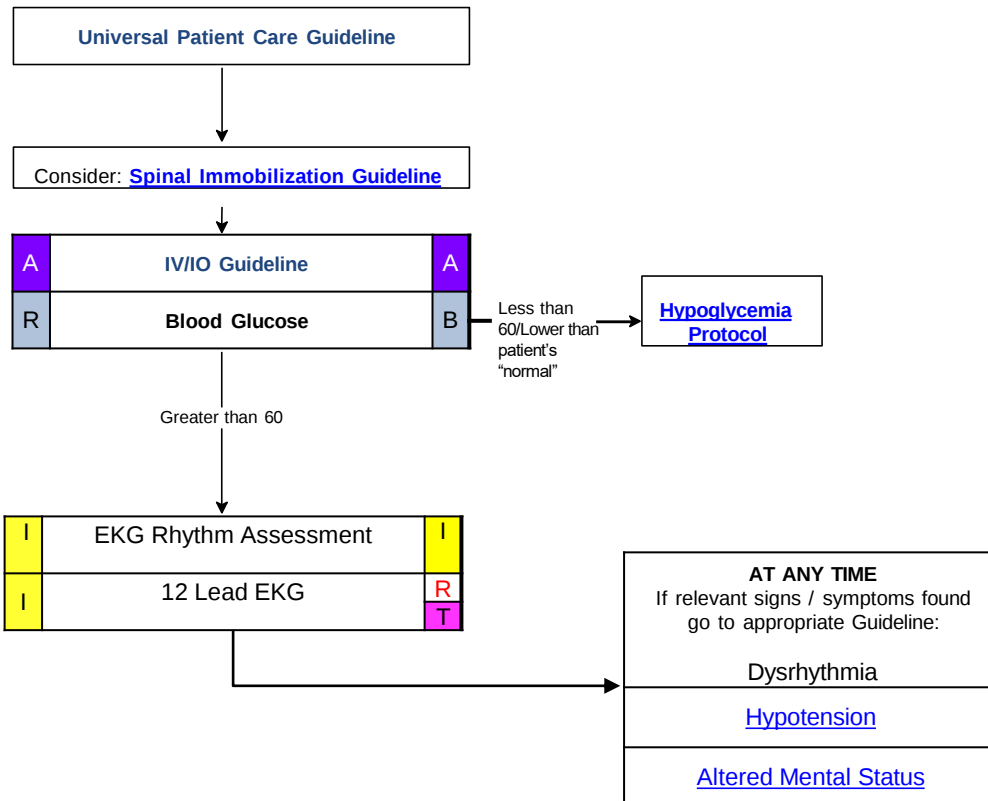
- Cardiac history, stroke, seizure
- Occult blood loss (GI, ectopic)
- Females: LMP, vaginal bleeding
- Fluid loss: nausea, vomiting, diarrhea
- Past medical history
- Medications

Signs and Symptoms:

- Loss of consciousness
- Lightheadedness, dizziness
- Palpitations, slow or rapid pulse
- Pulse irregularity
- Decreased blood pressure

Differential:

- Vasovagal
- Orthostatic hypotension
- Cardiac syncope
- Micturition / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock (see Shock Protocol)
- Toxicologic (Alcohol)
- Medication effect (hypertension)

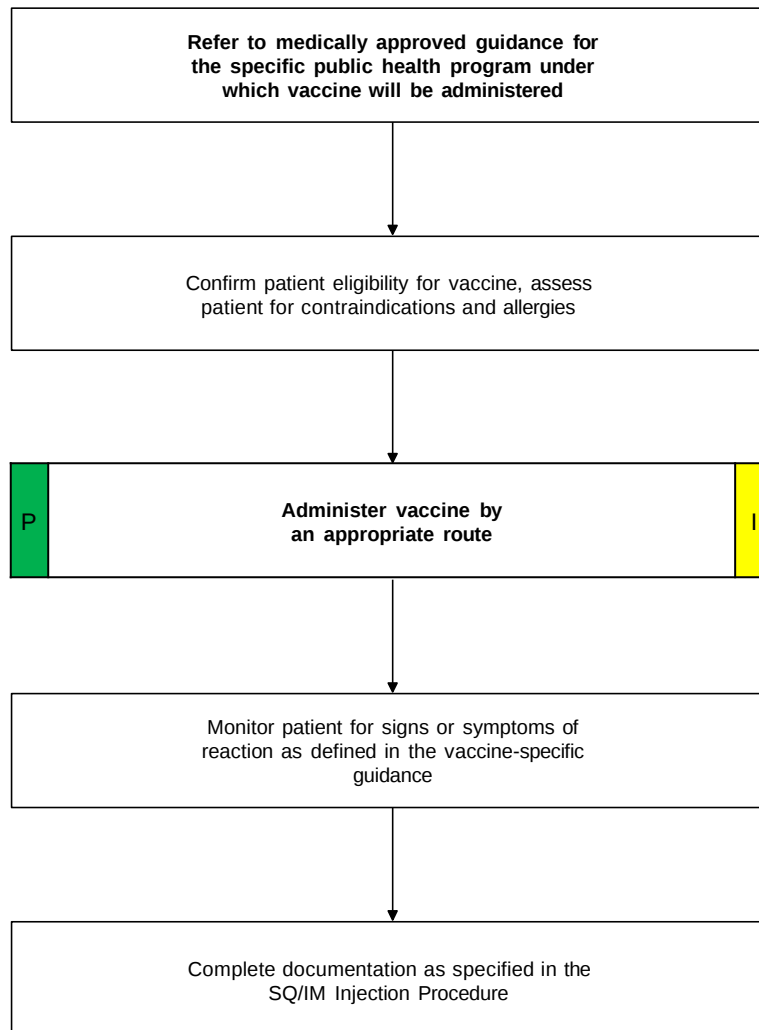


Pearls:

Exam: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neurological

- Syncope is often a sign of cardiac-distress, and hypotension, consider vitals signs and 12 lead EKG early.
- Assess for signs and symptoms of trauma if associated or questionable fall with syncope.
- Consider dysrhythmias, GI bleed, ectopic pregnancy, and seizure as possible causes of syncope.
- **These patients should be transported.**
- A large percentage of geriatric syncope is cardiac dysrhythmia-based.

Vaccination Administration

**Pearls:**

- The most common site for subcutaneous injection is the arm. Injection volume should not exceed 1 mL.
- The possible injection sites for intramuscular injection include the arm, buttock and thigh.
- Injection volume should not exceed 1 mL for the arm and not more than 2 mL in the thigh or buttock.
- The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 mL.

Vertigo/Severe Dizziness

History:

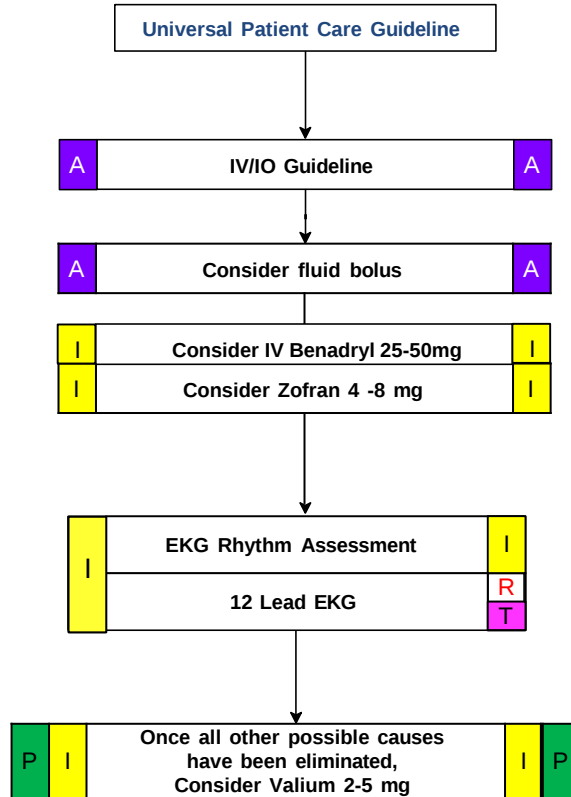
- Known diagnosis of vertigo

Signs and Symptoms:

- Severe dizziness
- Feeling of falling or spinning
- Nausea
- Dizziness is often worsened by turning head or change in position.

Differential:

- CVA
- Cardiac Dysrhythmia
- STEMI
- Dehydration



Pearls:

- **Vertigo can be a symptoms of a stroke.** Be very cautious not to confuse sudden loss of balance with vertigo. If any question exists err on the side of caution.
- Attempt to accommodate a position of comfort during transport as this may alleviate symptoms.
- In patients with vertigo eliciting movement of the head and extraocular muscles can trigger vertigo and result in vomiting. Avoid this whenever possible.
- Vertigo is a dx of exclusion and should not be considered until all other life-threats have been ruled out.

Vomiting/Nausea

History:

- 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 / diarrhea
- Drug Use/THC

Signs and Symptoms:

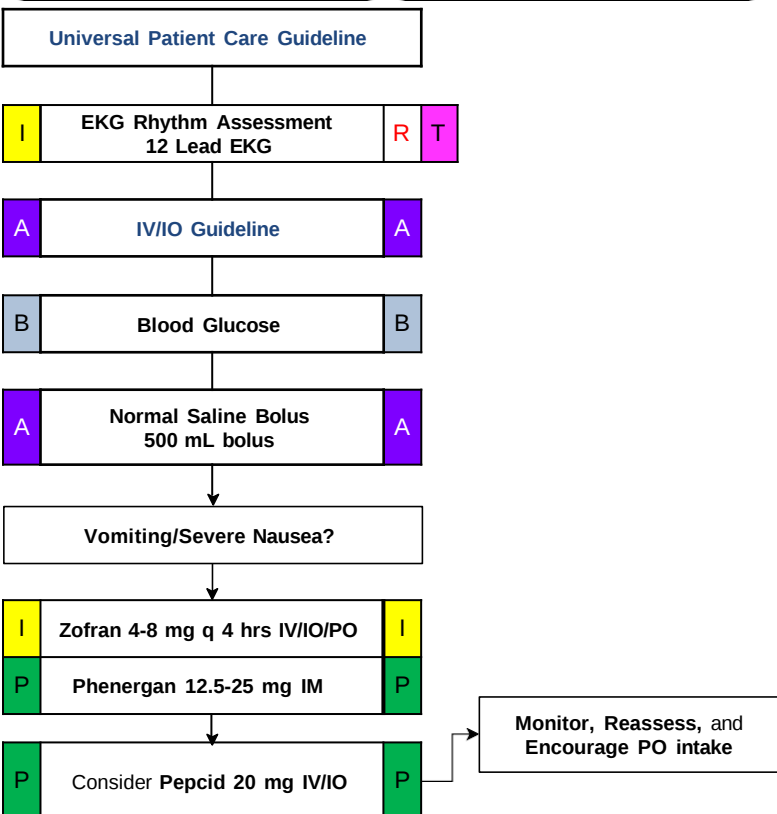
- Pain
- Character of pain (constant, intermittent, sharp, dull, etc.)
- Distention
- Constipation
- Diarrhea
- Anorexia
- Radiation

Associated symptoms: (Helpful to localize source)

- Fever
- Headache
- Blurred vision
- Weakness
- Malaise
- Myalgias
- Cough
- Headache
- Dysuria
- Mental status changes
- Rash

Differential:

- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAID's, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food- or toxin-induced
- Medication or Substance abuse
- Pregnancy
- Cannabinoid hyperemesis syndrome



Pearls:

- Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neurological
- Maintain high suspicion of a cardiac event and increased ICP.
 - The list of differentials for N&V is long. Attempt to identify underlying conditions.

Carbon Monoxide Exposure

History:

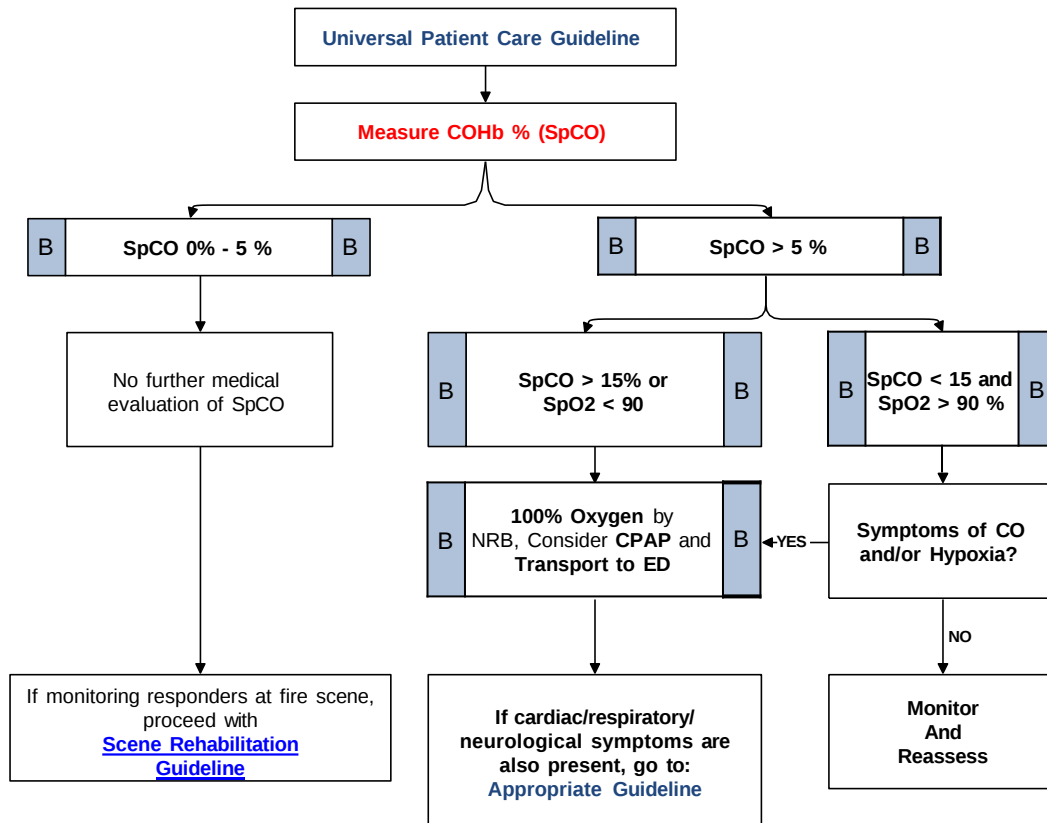
- Known or suspected CO exposure
- Suspected source/duration of exposure
- Age
- Known or possible pregnancy
- Reason (accidental, suicidal)
- Measured atmospheric levels
- Past medical history, medications

Signs and Symptoms:

- Altered mental status/dizziness
- Headache, Nausea/Vomiting
- Chest Pain/Respiratory distress
- Neurological impairments
- Vision problems/reddened eyes
- Tachycardia/tachypnea
- Arrhythmias, seizures, coma

Differential:

- Effects of other toxic byproducts of fire (Cyanide Poisoning)
- Acute cardiac event
- Acute neurological event
- Flu/GI illness
- Acute intoxication
- Diabetic Ketoacidosis
- Headache of non-toxic origin



Pearls:

* **Fetal hemoglobin has a greater attraction for CO than maternal hemoglobin. Females who are known to be pregnant or who could be pregnant should be advised that EMS-measured SpCO levels reflect the adult's level, and that fetal COHb levels may be higher. Recommend Hospital evaluation for any CO exposed pregnant person. **Poison Control: (800) 222-1222****

- The absence (or low detected levels of) of COHb is not a reliable predictor of firefighter or victim exposure to other toxic byproducts of fire.
- In obtunded fire victims, consider [WMD](#) and/or [Cyanide Protocols](#).
- The differential list for CO Toxicity is extensive. Attempt to evaluate other correctable causes when possible.
- Chronic CO exposure is clinically significant; therefore advice on smoking cessation is important medical instruction.
- The SpCO finger probe should be used and applied to measure a patient's CO%. The Monitor must also have the correct setting.

Cyanide Poisoning

Indications:

Any patient in which cyanide poisoning is known or suspected. Burning plastics and synthetic may use cyanide poisoning.

Mechanism of poisoning:

Blocks the patient's ability to use oxygen as an energy source at the cellular level.

Equipment:

1. Cyanokit 5g
 - 2 vials of Hydroxocobalamin 2.4g
 - IV admin set
 - 2 transfer spikes
 - Quick Reference Guide
2. Standard ALS Equipment

Clinical signs and symptoms (SEVERE):

1. Neurologic:
 - a. Seizures
 - b. Coma
2. Pulmonary
 - a. Increased respiratory rate
 - b. Apnea
3. Cardiovascular
 - a. Tachycardia/Hypertension (early)
 - b. Bradycardia/Hypotension/Arrest (late)

Treatment Protocol: (Remember to DECON and PPE)

Starting Dose: 5 grams (2 vials) of hydroxocobalamin

1. Reconstitute.

2. Add 100 mL of 0.9% Sodium Chloride Injection to vial using transfer spike. Fill to line in upright position.

3. Mix.

Rock or rotate vial for 30 seconds to mix solution. **Do Not Shake.**

4. Infuse First Vial.

Use vented IV tubing to hang and infuse over 7.5 minutes.

5. Infuse Second Vial (Repeat Steps 1. and 2. before second infusion).

Use vented IV tubing to hang and infuse over 7.5 minutes.

Hydrofluoric Acid Exposure

History

- Suspected source (industry or pharmaceutical labs)
- Known Exposure
- Reason (accidental/suicidal)
- Past medical history/medications

Signs and Symptoms:

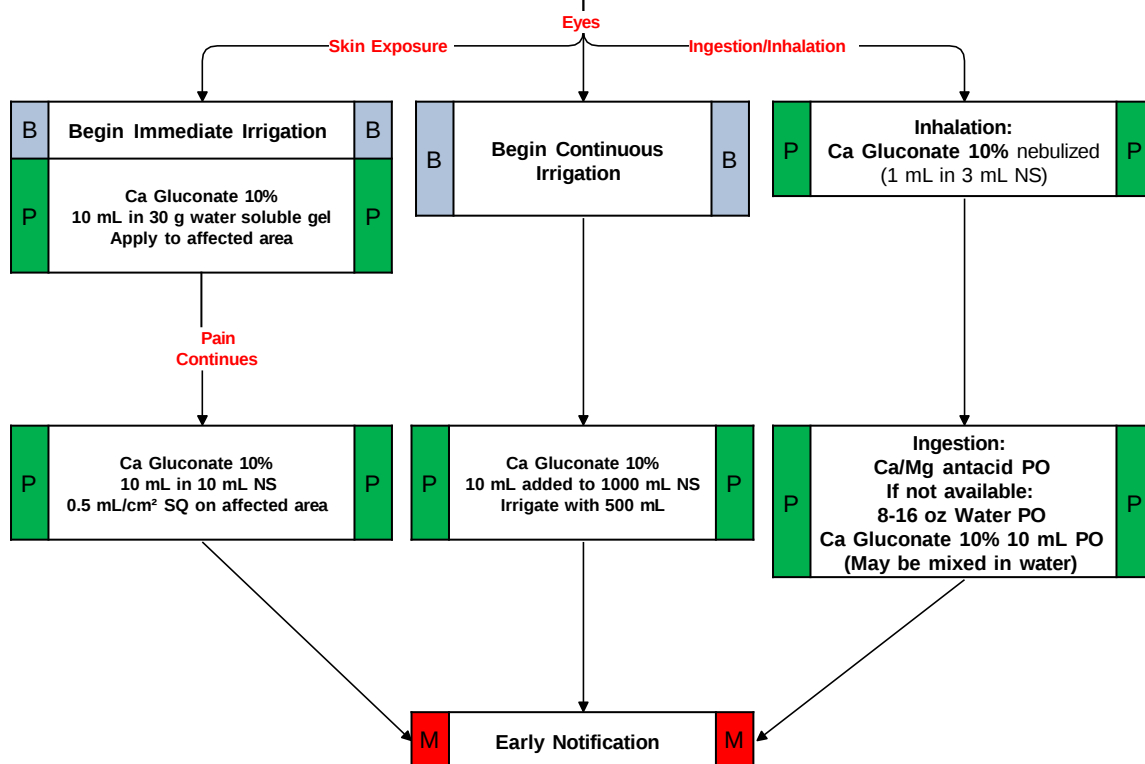
- Altered mental status/dizziness
- Headache, Nausea/Vomiting
- Chest Pain/Respiratory distress
- Neurological impairments
- Vision problems/reddened eyes
- Tachycardia/tachypnea
- Arrhythmias, seizures, coma

Differential:

- Acute cardiac event
- Acute neurological event
- Acute intoxication

Request HazMat response as appropriate
IF PROPERLY TRAINED AND EQUIPPED:
 Remove patient from source of exposure.
 Decontaminate patient.
 Neoprene or PVC gloves to prevent exposure.

Universal Patient Care Guideline



Pearls:

- Do NOT begin transport until all contaminated clothing has been removed and patient has been decontaminated and cleared by HAZMAT for transport.
- Hydrofluoric acid >50% usually cause immediate pain. Exposure to lower concentrations may have delayed presentation of 1-8 hrs (20-50%) or 24 hrs (<20%).
- Pain medication should be used judiciously as complete lack of pain is confirmation for acid neutralization

Hydrogen Sulfide (H₂S) Exposure

Introduction:

Hydrogen sulfide (H₂S) poisoning is an inherent occupational hazard of work in the oil field. Hydrogen sulfide is a colorless gas that smells of rotten eggs. Significant H₂S poisoning usually occurs by inhalation. Local irritant effects, along with arrest of cellular respiration may follow. H₂S forms a complex bond to iron causing inhibition of mitochondrial cytochrome oxidase (iron-containing protein), thereby arresting aerobic metabolism in an effect similar to cyanide toxicity.

As a cellular poison, H₂S affects all organs, particularly the nervous system. The spectrum of illness depends on concentration and duration of exposure. Low level exposure most often affects the eyes and mucous membranes while very high concentrations (>800 ppm) can cause sudden death.

Based on similarities in cyanide and hydrogen sulfide toxicity, induced methemoglobinemia may be used for treatment of H₂S toxicity. Methemoglobin, having four times the affinity to H₂S than cytochrome oxidase, acts as a scavenger for H₂S. Amyl nitrite and sodium nitrite induce methemoglobinemia and therefore act as antidotes to hydrogen sulfide poisoning.

Assessment:

Universal Patient Care Guideline

- The presence of H₂S is usually apparent because of the characteristic rotten egg smell.
- However, concentrations above 150 ppm may overwhelm the olfactory nerve so that the victim has no warning of the exposure.

The following symptoms and signs will help determine the level of exposure and therefore aid in assessing the patient for the appropriate treatment:

The following symptoms and signs will help determine the level of exposure and therefore aid in assessing the patient for the appropriate treatment:

Low-Level Exposure

- S/S: headaches, asthenia, bronchitis, conjunctivitis, drooling, wheezing.

High-Level Exposure

- S/S: cough, dyspnea, vertigo, confusion, nausea/vomiting, loss of consciousness, tremulousness, agitation, cyanosis, pulmonary edema, hypotension, bradycardia, hemoptysis.

Very-High-Level Exposure

- S/S: myocardial infarction, seizure, coma, cardiorespiratory arrest.

Hydrogen Sulfide (H₂S) Exposure

Treatment Protocol:

Low-Level Exposure

1. Assure scene safety and **DO NOT ENTER HOT ZONE** (contaminated area).
2. Utilize Fire Department and HAZMAT personnel to move patient from HOT ZONE into COLD ZONE (non-contaminated area).
* Will require specialized safety equipment (e.g. SCBAs, HAZMAT eq.).
3. Maintain Airway.
4. Decontaminate the patient to include removing all clothing and disposing of clothing appropriately. Keep patient warm.
5. Emergency decontamination shower if necessary.
6. Flush or irrigate eyes with NS or sterile water.
7. Administer high flow O₂ to maintain SaO₂>94% and assist ventilations as needed using appropriate airway adjunct.
8. Monitor EKG.
9. Monitor EtCO₂.
10. Start large bore IV of NS, TKO. Consider 2nd large bore IV of NS.
11. Transport immediately while reassessing patient and monitoring vital signs.

High/Very High-Level Exposure

[ANY victim w/ altered mentation and/or positive loss of consciousness]

1. Assure scene safety and **DO NOT ENTER HOT ZONE** (contaminated area).
2. Utilize Fire Department and HAZMAT personnel to move patient from HOT ZONE into COLD ZONE (non-contaminated area). * Will require specialized safety equipment (e.g. SCBAs, HAZMAT eq.).
3. Maintain Airway.
4. Decontaminate the patient to include removing all clothing and disposing of clothing appropriately. Keep patient warm.
5. Emergency decontamination shower if necessary.
6. Flush or irrigate eyes with NS or sterile water.
7. Administer high flow O₂ to maintain SaO₂>94% and assist ventilations as needed using appropriate airway adjunct.
8. Monitor EKG.
9. Monitor EtCO₂.
10. Consider **Amyl Nitrite** inhalant in nebulizer connected to BVM.
* Using BVM with high flow O₂, administer Amyl Nitrite inhalant for 15-30 seconds every 2-3 minutes.
* If patient LOC returns to AAOx4, discontinue Amyl Nitrite and continue monitoring patient.
11. Start large bore IV of NS, TKO. Consider 2nd large bore IV of NS.
12. Discontinue Amyl Nitrite once IV established.
13. Administer **Sodium Nitrite**:
Adult dose: 300 mg (10 mL 3% solution) IV/IO at 2.5-5.0 mL/min (over ~2-4 min).
Pediatric dose: 0.2 mL/kg of 3% solution (not to exceed 10 mL).
14. Transport immediately while reassessing patient and monitoring vital signs.

Nerve Agent Exposure

History:

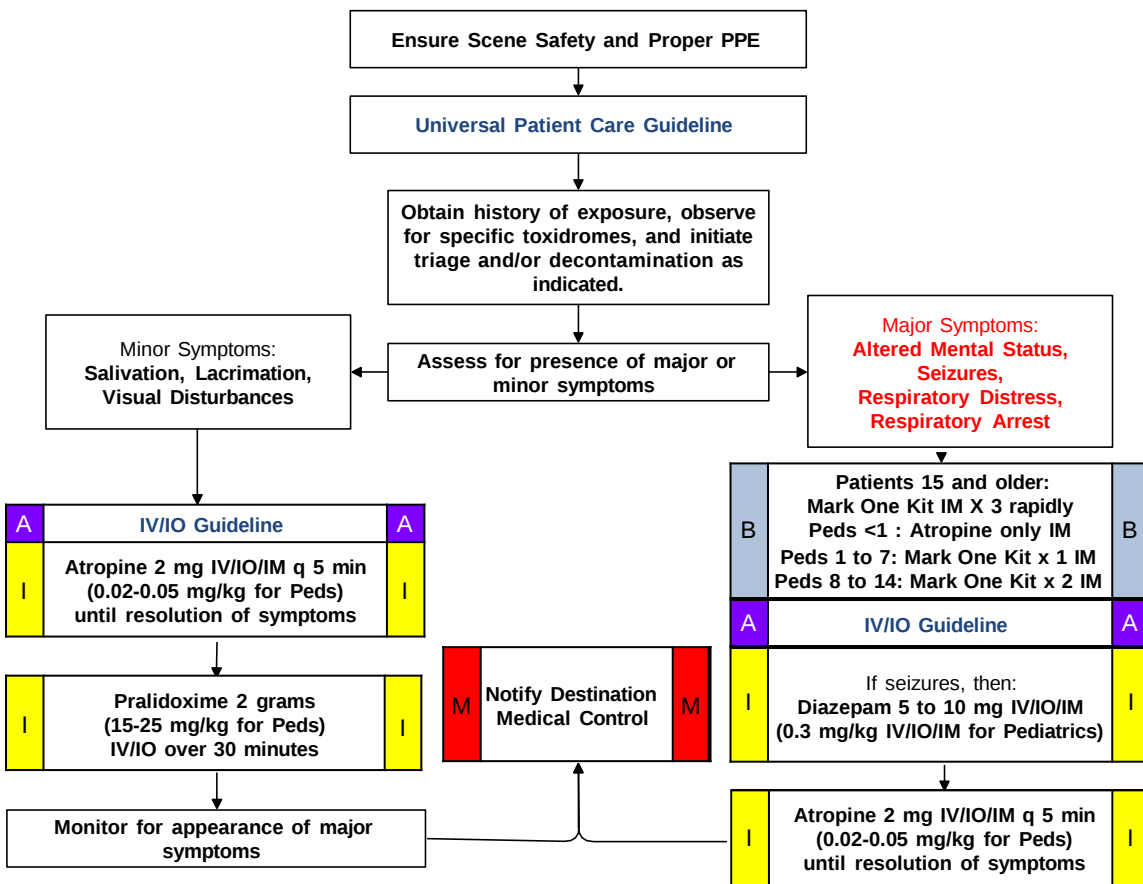
- Exposure to chemical, biologic, radiologic, or nuclear hazard
- Potential exposure to unknown substance/hazard

Signs and Symptoms:

- Salivation
- Lacrimation
- Visual Disturbances
- Respiratory Distress
- Diaphoresis
- Seizure Activity
- Respiratory Arrest

Differential:

- Nerve agent exposure (e.g., VX, Sarin, Soman, etc.)
- Organophosphate exposure (pesticide)
- Vesicant exposure (e.g., Mustard Gas, etc.)
- Respiratory Irritant Exposure (e.g., Hydrogen Sulfide, Ammonia, Chlorine, etc.)



Pearls:

- In the face of an attack, begin with 1 Mark One kit for patients less than 7 years of age, 2 Mark One kits from 8 to 14 years of age, and 3 Mark One kits for patients 15 years of age and over. Infants less than one receive the whole atropine component of the Mark 1 kit, not the pralidoxime.
- If Triage/MCI issues exhaust supply of Mark One kits, use pediatric Atropens (if available). Use the 0.5 mg dose if patient is less than 39 pounds, 1 mg dose if patient weighs between 40 to 90 pounds, and 2 mg dose for patients greater than 90 pounds.
- Follow local HAZMAT protocols for decontamination and use of personal protective equipment
- For patients with major symptoms, there is no limit for atropine dosing.
- Carefully evaluate patients to ensure symptoms are not from exposure to another agent (e.g., narcotics, vesicants).
- Each Mark One kit contains 600 mg of Pralidoxime (2-PAM) and 2 mg of Atropine.

Bites and Envenomations

History:

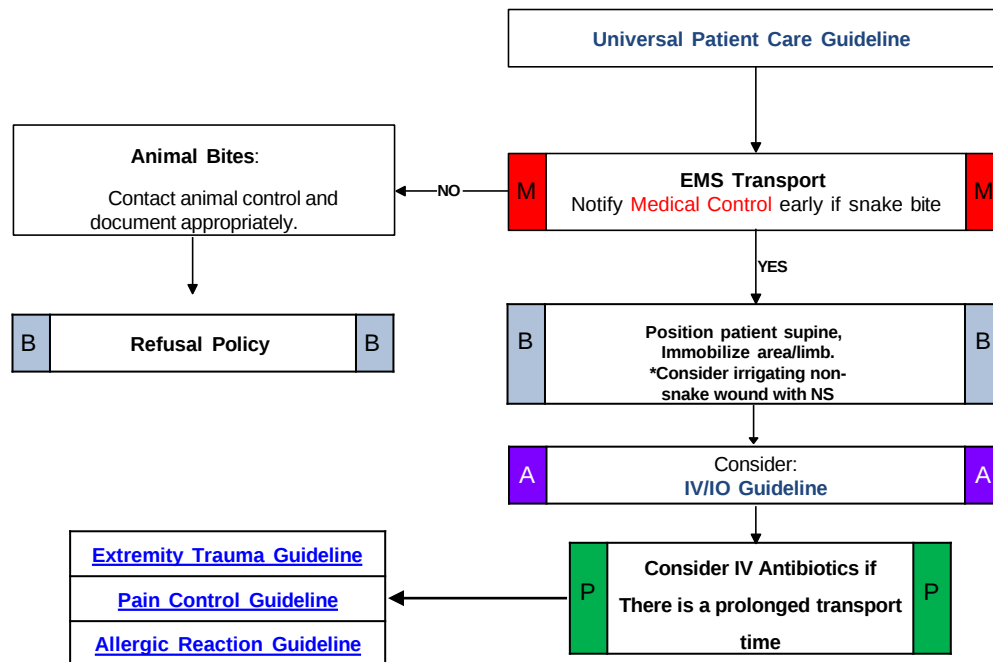
- Type of bite / sting
- Description / photo with patient for identification of creature involved
- Time, location, size of bite / sting
- Previous reaction to bite / sting
- Domestic vs. Wild
- Tetanus and Rabies risk
- Immunocompromised patient

Signs and Symptoms:

- Rash, skin break, wound
- Pain, soft tissue swelling, redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath, wheezing
- Allergic reaction, hives, itching
- Hypotension or shock

Differential

- Animal/human bite
- Snake (poisonous) bite
- Spider bite
- Insect sting/bite (bee, wasp, ant, tick, etc)
- Infection
- Rabies risk (bats, skunks or raccoons)
- Tetanus risk



Pearls:

Exam: Mental Status, Skin, Extremities (Location of injury), and a complete Neck, Lung, Heart, Abdomen, Back, and Neurological exam if systemic effects are noted

- Human bites are much worse than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of Rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacteria (*Pasteurella multocida*).
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake.
- Amount of envenomation is variable, generally worse with larger snakes and early in spring.
- Envenomation is unlikely if there is no pain or swelling.
- It is NOT necessary to take the snake to the ED with the patient.
- Black Widow spider bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop (spider is black with red hour glass on belly).
- Brown Recluse spider bites are minimally painful to painless. Little reaction is noted initially but tissue necrosis at the site of the bite develops over the next few days (brown spider with fiddle shape on back).
- Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.
- Immuno-compromised patients are at an increased risk for infection: diabetics, & chemotherapy/transplant patients.
- **Consider contacting the Poison Control Center for guidance 1-800-222-1222.**

Burns: Chemical & Electrical

History:

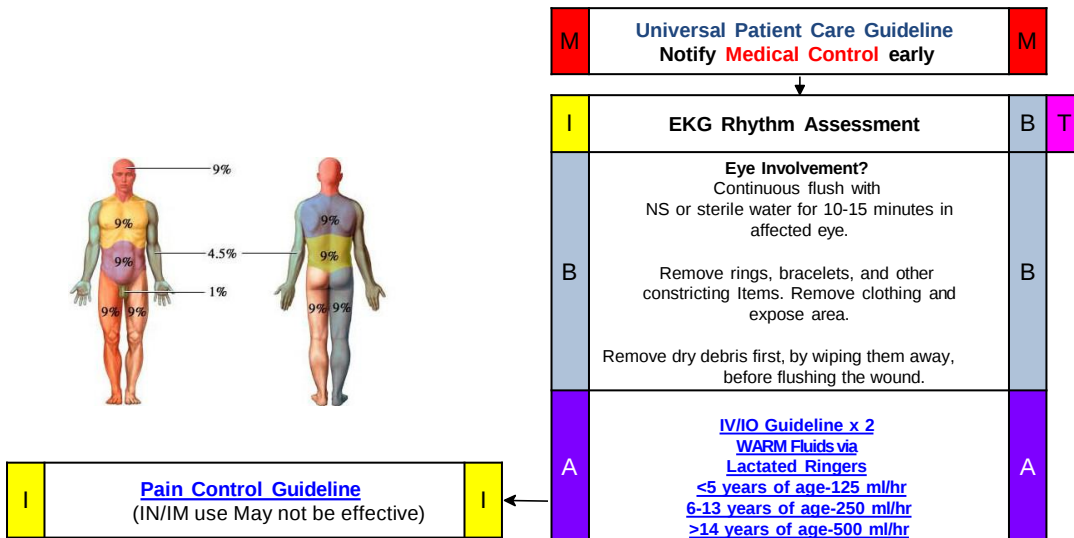
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness
- Tetanus/Immunization status

Signs and Symptoms:

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension / shock
- Airway compromise / distress
- Singed facial or nasal hair
- Hoarseness / wheezing

Differential:

- **Superficial (1°)** red and painful
- **Partial thickness (2°)** blistering
- **Full thickness (3°)** painless and charred or leathery skin
- **Chemical**
- **Thermal**
- **Electrical**
- **Radiation**



**Critical
(RED)**

>15% TBSA Partial/Full thickness Burn
Burns with Multiple Trauma
Burns with definite airway compromise
[Priority I Trauma Activation]

**Serious
(Yellow)**

5-15% TBSA Partial/Full thickness Burn
Suspected inhalation injury or requiring intubation for airway stabilization
Hypotension
GCS < 14
[Priority I Trauma Activation]

**Minor
(Green)**

< 5% TBSA Partial/Full thickness Burn
No inhalation injury, Not Intubated, Normotensive
GCS > 14
[Transport to the Local Hospital]

Pearls **Chemical**

- Refer to Decontamination Procedure.
- Normal saline or sterile water is preferred for irrigation.
- Tap water is acceptable if no other water source is readily available.
- Flush the area as soon as possible with the cleanest readily available water.
- Use pain medication judiciously with HF burns as complete absence of pain is the only way to confirm all acid is neutralized

Pearls **Electrical**

- Do not contact the patient until you are certain the source of the electric shock has been disconnected.
- Attempts to locate contact points, (entry wounds where the AC source contacted the patient, an exit at the ground point) both sites will generally be full thickness.
- Cardiac monitor, anticipate ventricular or atrial irregularity, to include V-tach, V-fib, heart blocks, etc.
- Attempt to identify the nature of the electrical source (AC vs DC), the amount of voltage and the amperage the patient may have been exposed to during the electrical shock.

Burns: Thermal

History:

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness
- Tetanus/Immunization status

Signs and Symptoms:

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension / shock
- Airway compromise / distress
- Singed facial or nasal hair
- Hoarseness / wheezing

Differential:

- Superficial (1°) red and painful
- Partial thickness (2°) blistering
- Full thickness (3°) painless and charred or leathery skin
- Chemical
- Thermal
- Electrical
- Radiation

M

Universal Patient Care Guideline
Notify **Medical Control** early

M

**Critical
(RED)**

>15% TBSA Partial/Full Thickness Burn
Burns with Multiple Trauma
Burns with definite airway compromise
[Priority I Trauma Activation]

**Serious
(Yellow)**

5-15% TBSA Partial/Full Thickness Burn
Suspected inhalation injury or requiring intubation for airway stabilization Hypotension GCS < 14
[Priority I Trauma Activation]

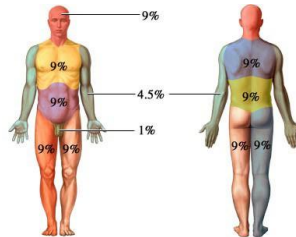
**Minor
(Green)**

< 5% TBSA Partial/Full Thickness Burn
No inhalation injury, Not Intubated, Normotensive
Minor (Green) GCS > 14
[Transport to the Local Hospital]

Airway: Adult Guideline

B	Remove rings, bracelets, and other constricting items	B
B	Cover burn with dry sterile sheet or dressings	B
A	<u>IV/IO Guideline x 2</u> <u>WARM Fluids via Lactated Ringers</u> <u><5 years of age-125 ml/hr</u> <u>6-13 years of age-250 ml/hr</u> <u>>14 years of age-500 ml/hr</u>	A
I	<u>Pain Control Guideline</u>	I

M Contact Medical Control M



B	Cool down the wound with Normal Saline	B
B	Cover burn with dry sterile sheet or dressings	B

****The IV solution should be changed to Lactated Ringers if it is available. It is preferred to Normal Saline.**

Critical or Serious Burns

* >5-15% total body surface area (TBSA); 2° or 3° burns, or 3° burns >5% TBSA for any age group, or circumferential burns of extremities, or electrical or lightning injuries, or suspicion of abuse or neglect, or inhalation injury, or chemical burns, or burns of face, hands, perineum, or feet, or any burn requiring hospitalization.

(These burns will require direct transport to a burn center once seen at a local facility where the patient can be stabilized with interventions such as airway management or pain relief if this is not available in the field or the distance to a burn center is significant.)

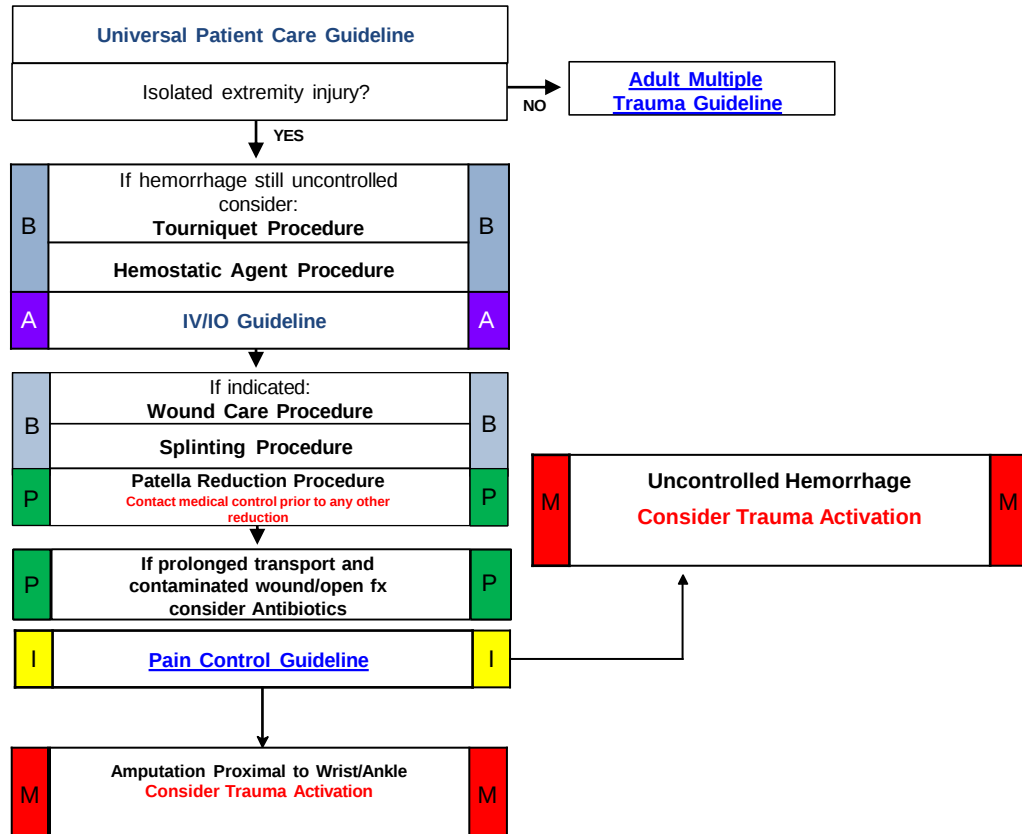
Pearls:

Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, Neurological

- Early intubation is required in significant inhalation injuries.
- Potential CO exposure should be treated with 100% oxygen, monitor with SpCO finger probe.
- Circumferential burns to extremities are dangerous due to potential vascular compromise 2° to soft tissue swelling.
- Burn patients are prone to hypothermia - Never apply ice or cool burns, must maintain normal body temperature.
- Do not overlook the possibility of multiple system trauma.
- Do not overlook the possibility for child abuse with children and burn injuries.

Extremity Trauma

History: - Type of injury - Mechanism: crush / penetrating / amputation - Time of injury - Open vs. closed wound / fracture - Wound contamination - Medical history - Medications - Extrication Time	Signs and Symptoms: - Pain, swelling - Deformity - Altered sensation / motor function - Diminished pulse / capillary refill - Decreased extremity temperature	Differential: - Deformities - Contusions - Abrasions - Punctures - Burns - Tenderness - Lacerations - Swelling
--	--	--


Pearls:

Exam: Mental Status, Extremity, Neurological

- Peripheral neurovascular status is important.
- In amputations, time is critical. Transport to Trauma Center.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise. Urgently transport any injury with vascular compromise.
- Blood loss may be concealed or not apparent with extremity injuries.
- Severe bleeding not rapidly controlled may necessitate application of a tourniquet. Lacerations must be evaluated for repair within 6 hours from the time of injury.
- If there is an amputation, clean amputated part, wrap in sterile dressing, soak in NS/sterile water, place part in air tight container, place container on ice if available.

Crush Injury

History:

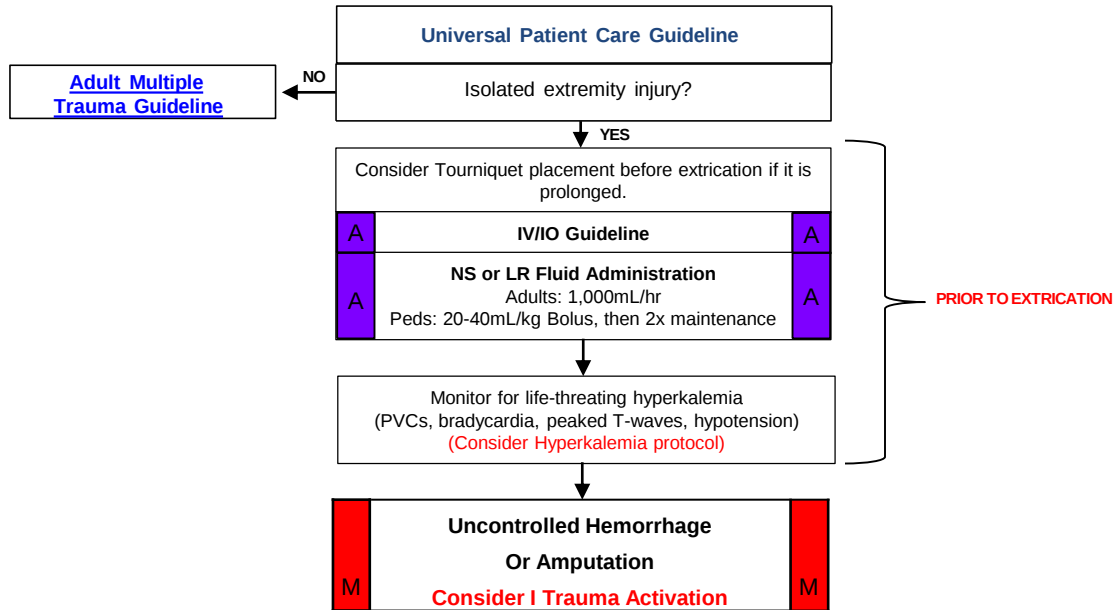
- Compression >60mins
- Involvement of a large muscle mass

Signs and Symptoms:

- Pain, swelling, deformity
- Trapped extremity
- Altered sensation/motor function
- Diminished pulse/capillary refill
- Decreased extremity temperature
- Cardiac arrhythmias
- EKG with peaked T-Waves and QRS>.12sec

Risks:

- Rapid deterioration of patient after entrapment release
- Hyperkalemia
- Hypocalcemia
- Compartment Syndrome
- Rhabdomyolysis
- Arrhythmia/Hypotension



Pearls:

Exam: Mental Status, Extremity, Neurological

- Crush syndrome can occur in as little as 1 hour of entrapment
- Tourniquets may delay life-threatening complication if fluid resuscitation and treatment cannot be immediately initiated
- Aggressive fluid resuscitation for Crush injury in the setting of non-compressible hemorrhage may increase hemorrhage. Balance the risk of uncontrolled hemorrhage against cardiotoxic effects of hyperkalemia.

Head Trauma

History:

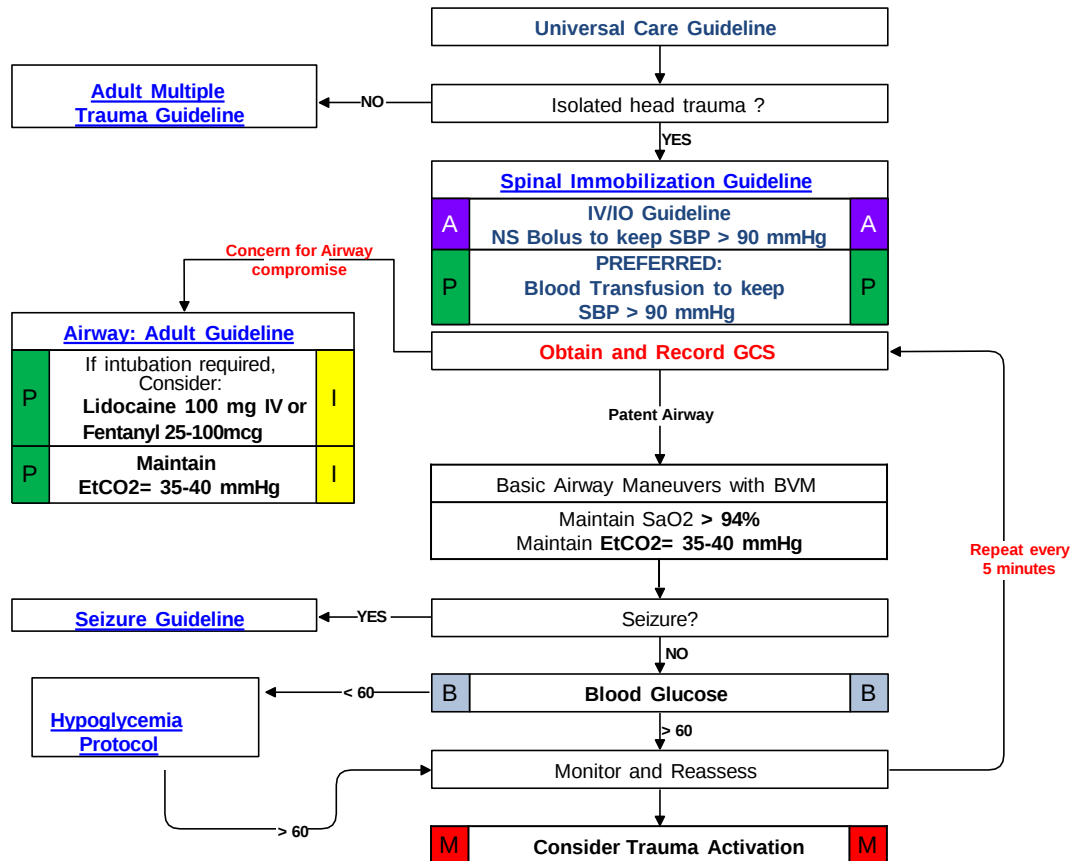
- Time of injury
- Mechanism: blunt / penetrating
- Loss of consciousness
- Bleeding
- Medical history
- Medications
- Evidence of multi -trauma
- Helmet use or damage to helmet

Signs and Symptoms:

- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Significant mechanism of injury

Differential:

- Skull fracture
- Brain injury (concussion, contusion, hemorrhage, or laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse



Pearls:

Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neurological

- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury and should be aggressively treated.
- 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 prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.

Adult Multisystem Trauma

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 / protective equipment
- Past medical history
- Medications

Signs and Symptoms:

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

Tourniquet application/Hemorrhage control

Airway: [Adult Guideline](#) if appropriate

Spinal Immobilization Guideline

B

Vital Signs including GCS

B

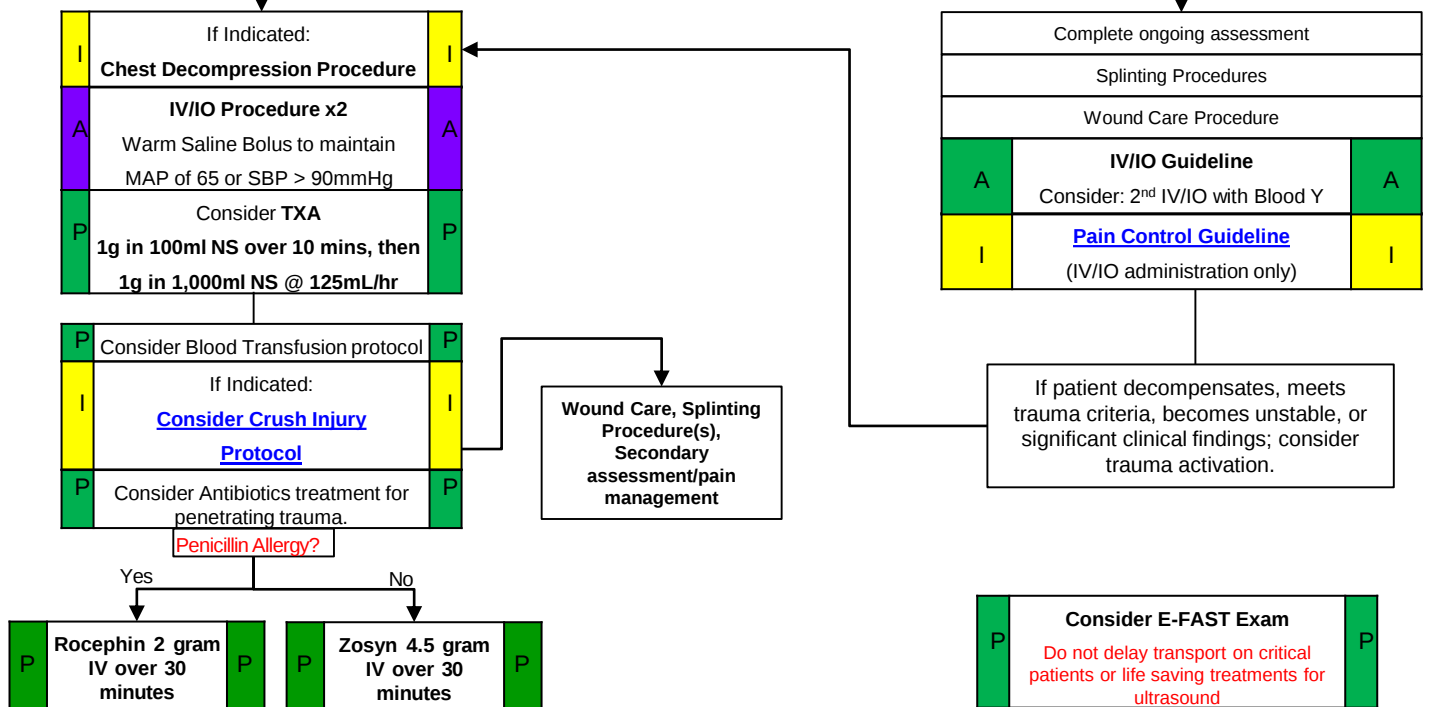
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Consider Trauma Activation

M

Trauma Activation
(Rapid Transport)

No Trauma
Activation



Pearls:

Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neurological

- In prolonged extrications/serious trauma consider air transport for transport speed and the ability to give blood.
- Zosyn should be used for all intra-abdominal injuries/penetrating trauma. Rocephin should be used for all other soft-tissue injuries or penetrating trauma or for those who are allergic to penicillin.
- Severe bleeding from an extremity not rapidly controlled may necessitate the application of a tourniquet.
- Geriatric patients should be evaluated with a high index of suspicion.
- Often occult injuries are more difficult to recognize and patients can decompensate unexpectedly with little warning.
- Record "Trauma Activation" criteria in electronic patient care reporting (ePCR) system.
- **Keep the patient warm.** Hypothermia, Acidosis, Coagulopathy, and Hypocalcemia are all considered lethal in trauma patients.

Spinal Immobilization Clearance



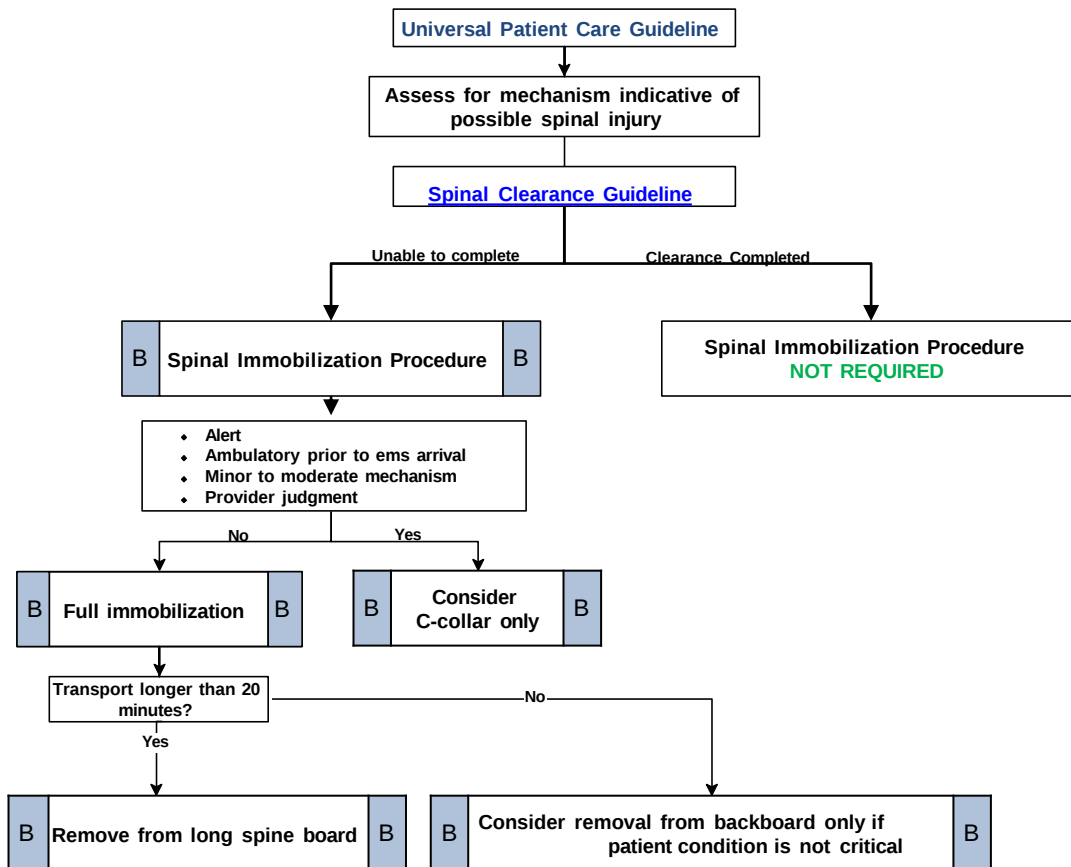
Pearls:

- Consider immobilization with mechanism of injury for any patient with arthritis, cancer, or other underlying disease.
- Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes and may indicate the need for spinal immobilization in the absence of symptoms.
- Range of motion should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted. The patient should touch their chin to their chest, extend their neck (look up), and turn their head from side to side (shoulder to shoulder) without spinal process pain.
- The acronym "**NSAIDS**" should be used to remember the steps in this protocol.
- "**N**" = Neurologic exam. Look for focal deficits such as tingling, reduced strength, or numbness in an extremity.
- "**S**" = Significant mechanism or extremes of age.
- "**A**" = Alertness. Is patient oriented to person, place, time, and event? Any change to alertness with this incident?
- "**I**" = Intoxication. Is there any indication that the person is intoxicated (impaired decision making ability)?
- "**D**" = Distracting injury. Is there any other injury which is capable of producing significant pain in this patient?
- "**S**" = Spinal exam. Look for point tenderness in any spinal process or spinal process tenderness with range of motion.
- In very old and very young patients, a normal exam may not be sufficient to rule out spinal injury.

Spinal Immobilization

Indications:

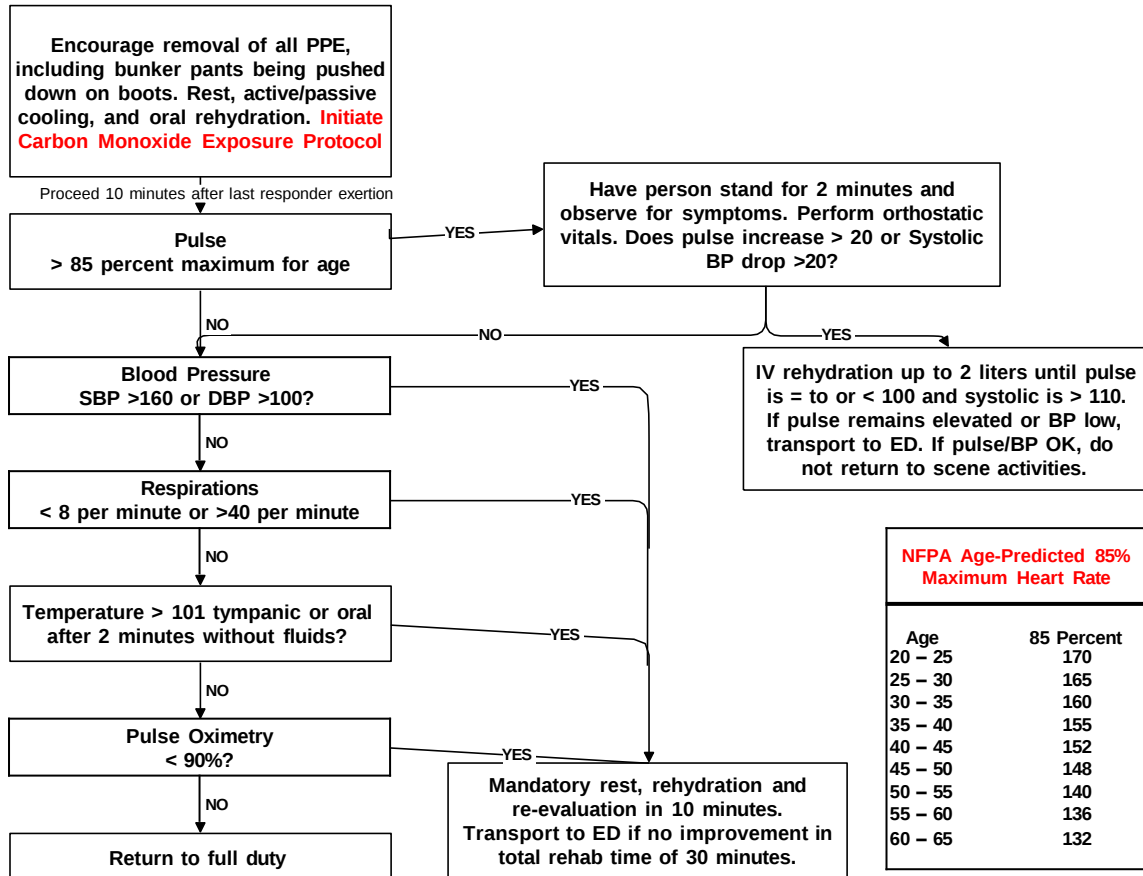
- Blunt trauma through high energy mechanism
- Axial loading injuries
- Significant mechanism suspicious of spinal injury
- Major bone or joint injury
- Trauma activations



Pearls:

- Consider immobilization with mechanism of injury for any patient with arthritis, cancer, or other underlying disease.
- Significant mechanism includes high-energy events such as ejection, high falls, and abrupt deceleration crashes and may indicate the need for spinal immobilization in the absence of symptoms.
- Range of motion should NOT be assessed if patient has mid-line spinal tenderness. Patient's range of motion should not be assisted. The patient should touch their chin to their chest, extend their neck (look up), and turn their head from side to side (shoulder to shoulder) without spinal process pain.
- Patients with penetrating trauma should only be immobilized to a long spine board if neurological deficits are found
- Take care not to unduly increase significant difficulty breathing or significant agitation by forcing a patient onto a long spine board when a cervical collar could be safely used.
- Full immobilization on a long board vs c-collar only should be considered, weighing the possible complications against the patient's clinical situation.
- In very old and very young patients, a normal exam may not be sufficient to rule out spinal injury.

Scene Rehabilitation



Pearls:

This protocol may be applied to adult patients on fire scenes and any gathering approved by Medical Director

Exam: Mental Status, Skin, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neurological

- When used for firefighter rehab, firefighters should report to rehab for evaluation after 45 minutes (1 45 minute SCBA cylinder), or earlier if the firefighter or incident commander desires.
- Any person complaining of shortness of breath, confusion, combativeness or headache will be treated with high flow oxygen and be transported to the hospital.

Automatic Transport Criteria:

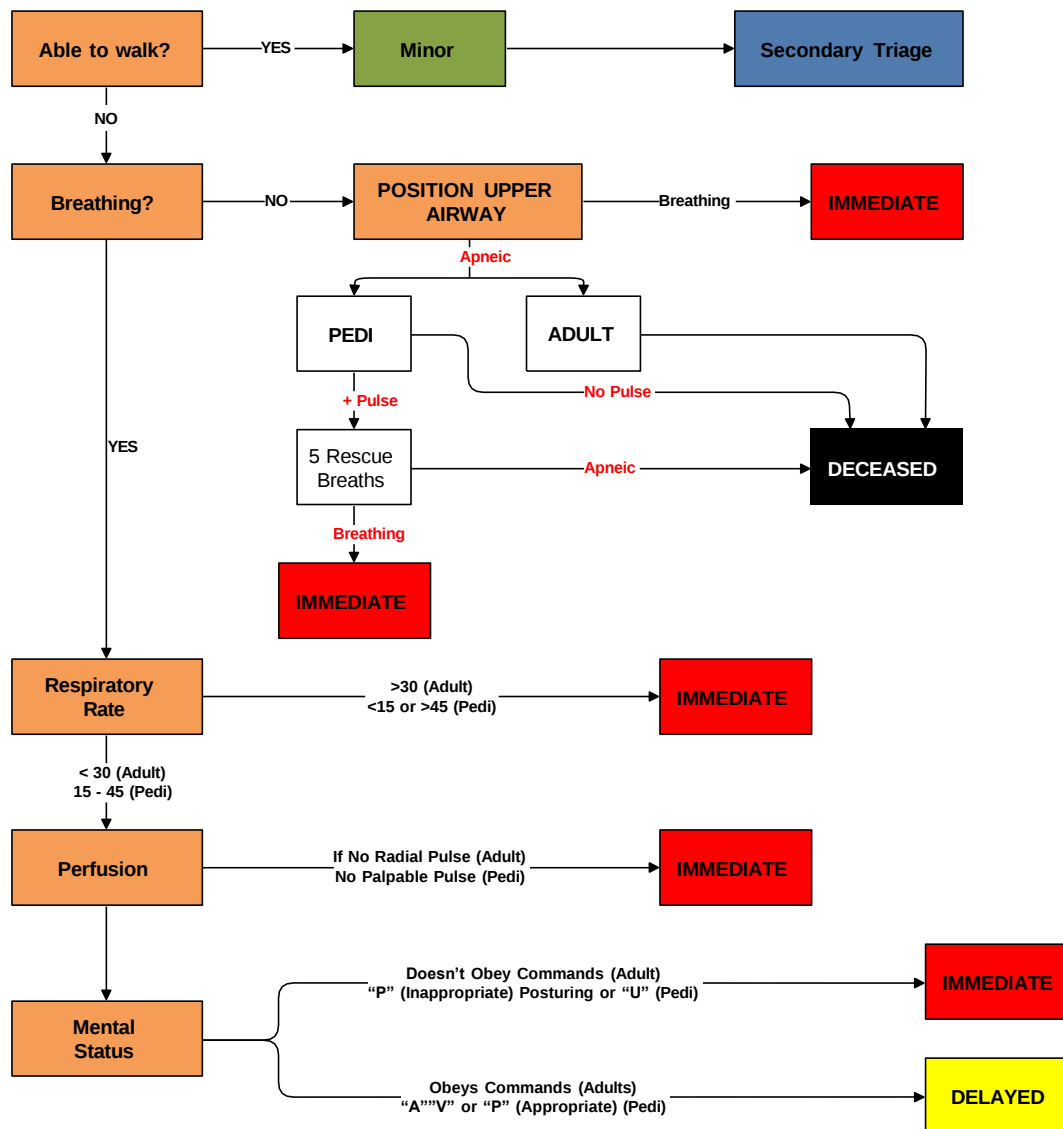
- Chest Pain.
- Shortness of breath unresolved by 10 minutes on high flow oxygen.
- Heart rhythm other than NSR or Sinus tachycardia.
- A syncopal episode, disorientation, or confusion.
- Vital signs that have not returned to normal after 30 minutes of rest.
- Inability to hold fluids down or an episode of vomiting.
- Request for transport for any reason.

Cooling Techniques:

- Expose by full gear removal.
- Immerse forearms in water in rehab chairs when available (most effective technique).
- Do not apply wet towels to neck or head of firefighters- risk of steam burns is increased.
- Cooling fans, ambient evaporative cooling.

Medical Control contact is not required to discontinue IV therapy to adult Emergency Services personnel treated under this protocol. For other approved gatherings, contact requirements are determined at approval.

START/Jump START Triage Algorithm



Pearls:

- 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.

Pediatric Respiratory Distress

History:

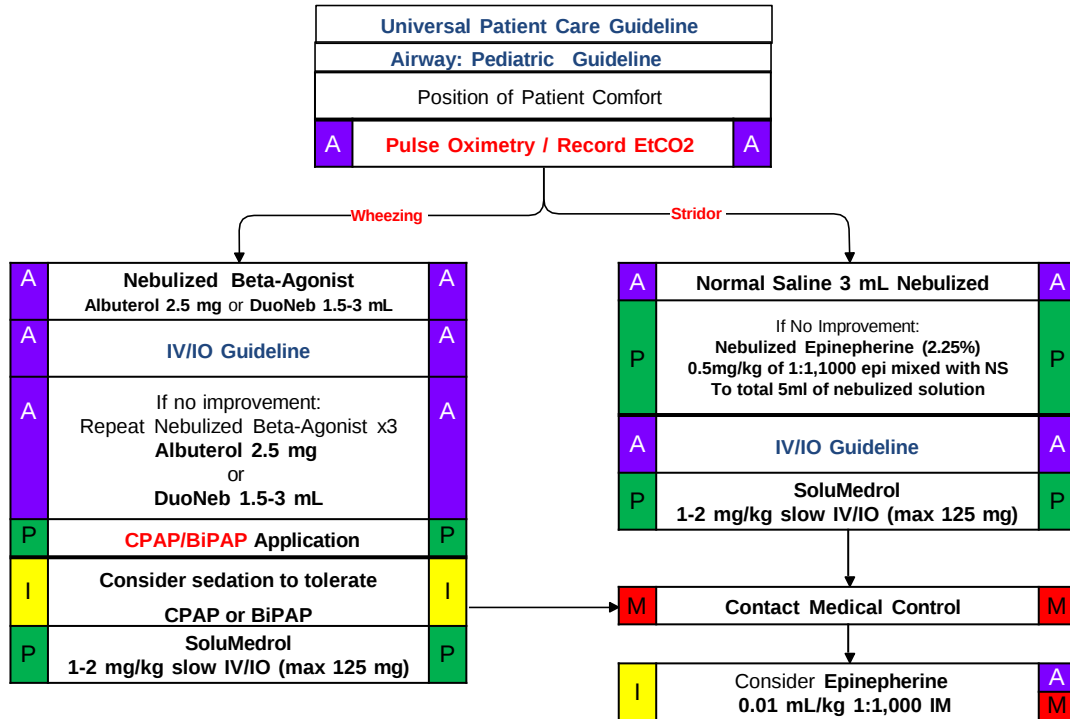
- Time of onset
- Possibility of foreign body
- Medical history
- Medications
- Fever or respiratory infection
- Other sick siblings
- History of trauma

Signs and Symptoms:

- Wheezing or stridor
- Respiratory retractions
- Increased heart rate
- Altered level of consciousness
- Anxious appearance

Differential:

- Asthma
- Aspiration
- Foreign body
- Infection
 - Pneumonia
 - Croup
 - Epiglottitis
- Congenital heart disease
- Medication or Toxin
- Trauma



Pearls:

- Maximum dose of IV epinephrine = 0.3 mg/dose, Maximum dose of SoluMedrol = 125 mg
- Do not force a child into a position. They will protect their airway by their body position.
- Bronchiolitis is a viral infection typically affecting infants which results in wheezing which may not respond to albuterol.
- Croup typically affects children < 2 years of age. It is viral, possible fever, gradual onset, no drooling is noted. Epiglottitis typically affects children > 2 years of age. It is bacterial, with fever, rapid onset, possible stridor, patient wants to sit up to keep airway open, drooling is common. Airway manipulation/over stimulation may worsen the condition.

Pediatric Bradycardia

History:

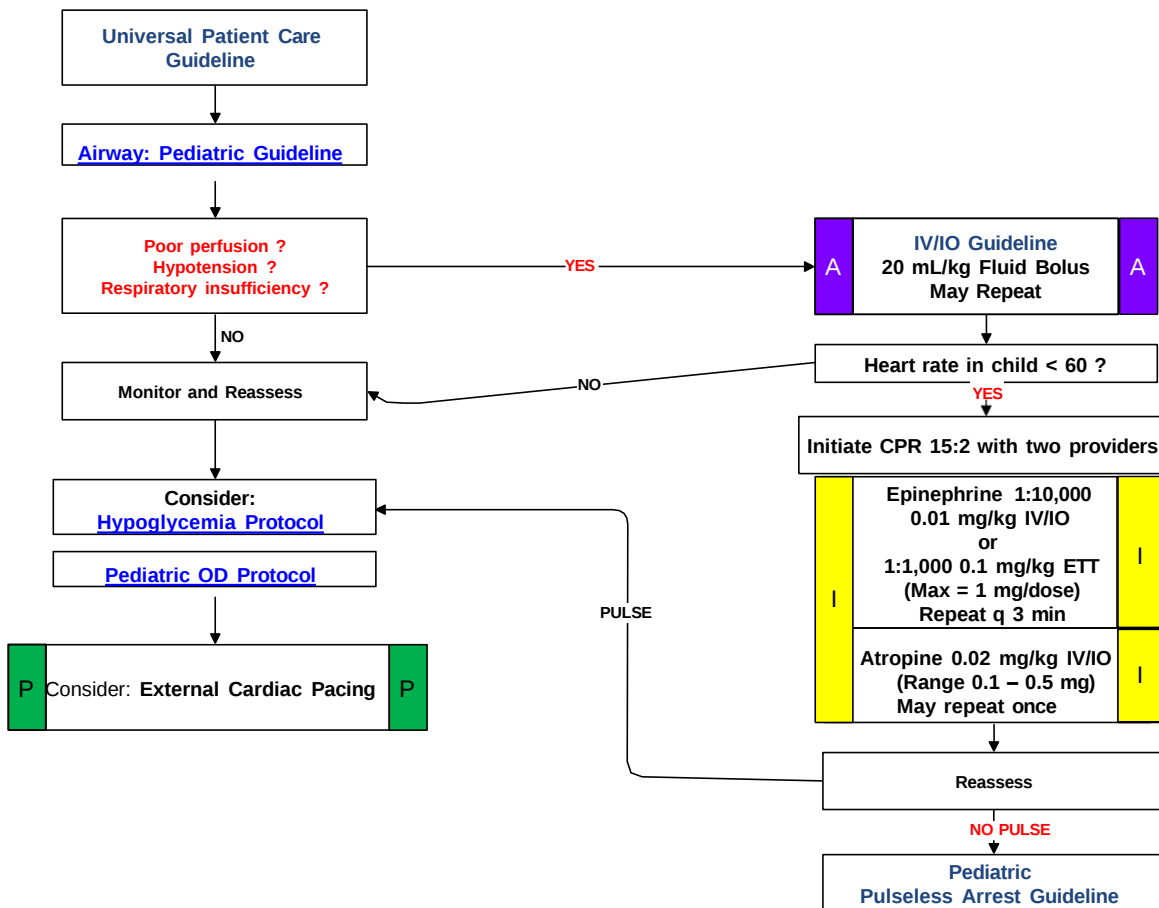
- Past medical history
- Foreign body exposure
- Respiratory distress or arrest
- Apnea
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

Signs and Symptoms:

- Decreased heart rate
- Delayed capillary refill or cyanosis
- Mottled, cool skin
- Hypotension or arrest
- Altered level of consciousness

Differential:

- Respiratory effort
- Respiratory obstruction
 - Foreign body / Secretions
 - Croup / Epiglottitis
- Hypovolemia
- Hypothermia
- Infection / Sepsis
- Medication or Toxin
- Hypoglycemia
- Trauma



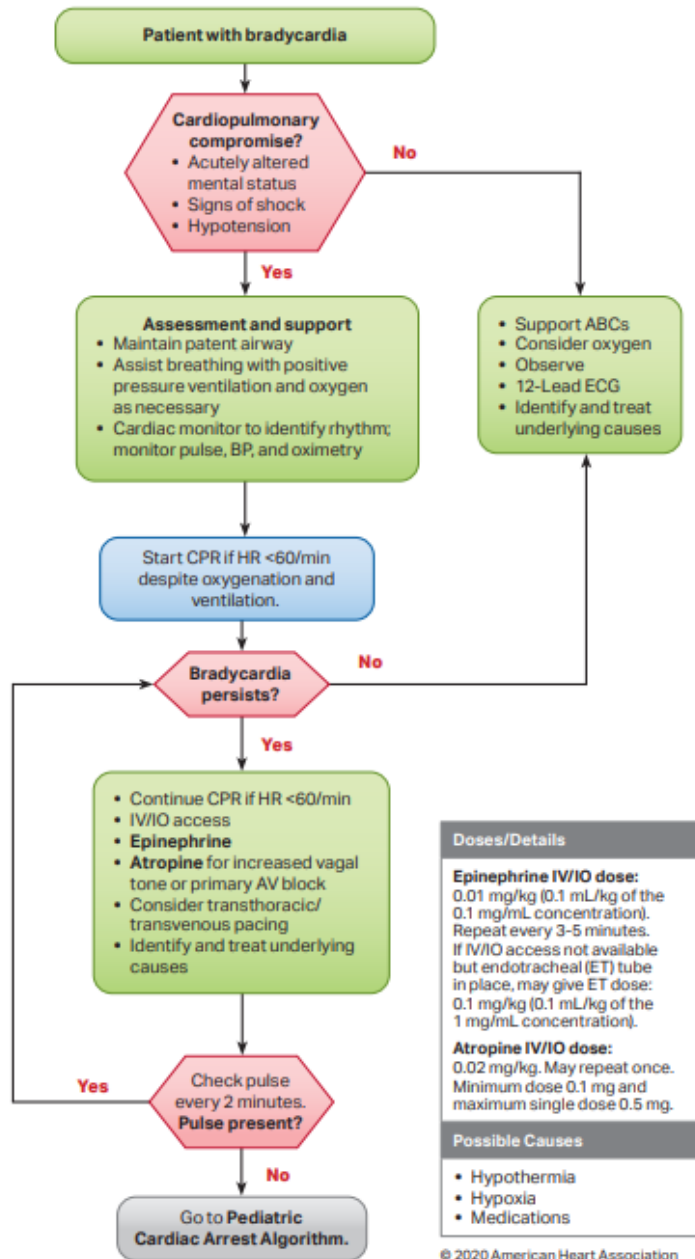
Pearls:

Exam: Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neurological

- Most maternal medications pass through breast milk to the infant.
- The majority of pediatric arrests are due to air way problems.
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- Pediatric patients requiring external transcutaneous pacing require the use of pads appropriate for pediatric patients per the manufacturer's guidelines.

Pediatric Bradycardia

Pediatric Bradycardia With a Pulse Algorithm



Pediatric Cardiac Arrest

History:

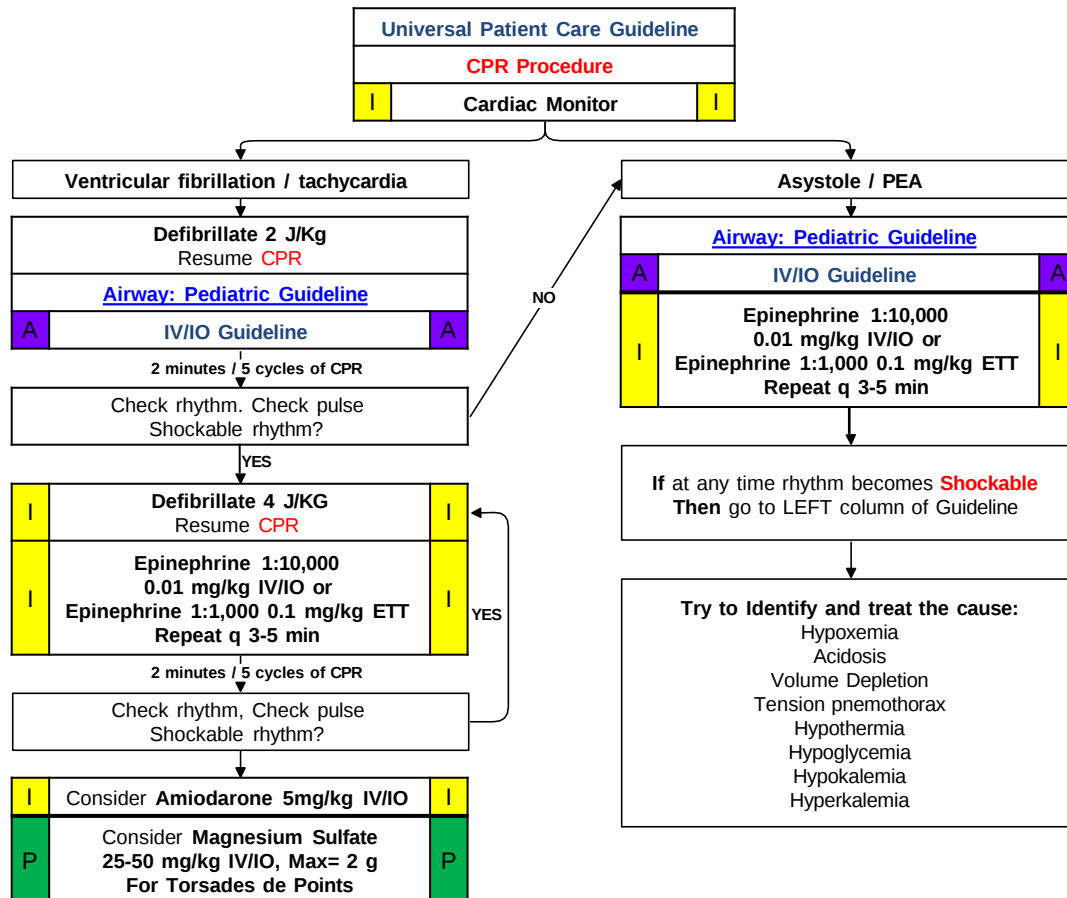
- Time of arrest
- Medical history
- Medications
- Possibility of foreign body
- Hypothermia
- Suspected Abuse
 - Shaken Baby Syndrome
 - Pattern of Injuries
- SIDS
- Congenital heart disease

Signs and Symptoms:

- Unresponsive
- Cardiac arrest

Differential:

- Respiratory failure
 - Foreign body
 - Secretions
 - Infection (croup, epiglottitis)
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Toxin or medication
- Hypoglycemia
- Acidosis

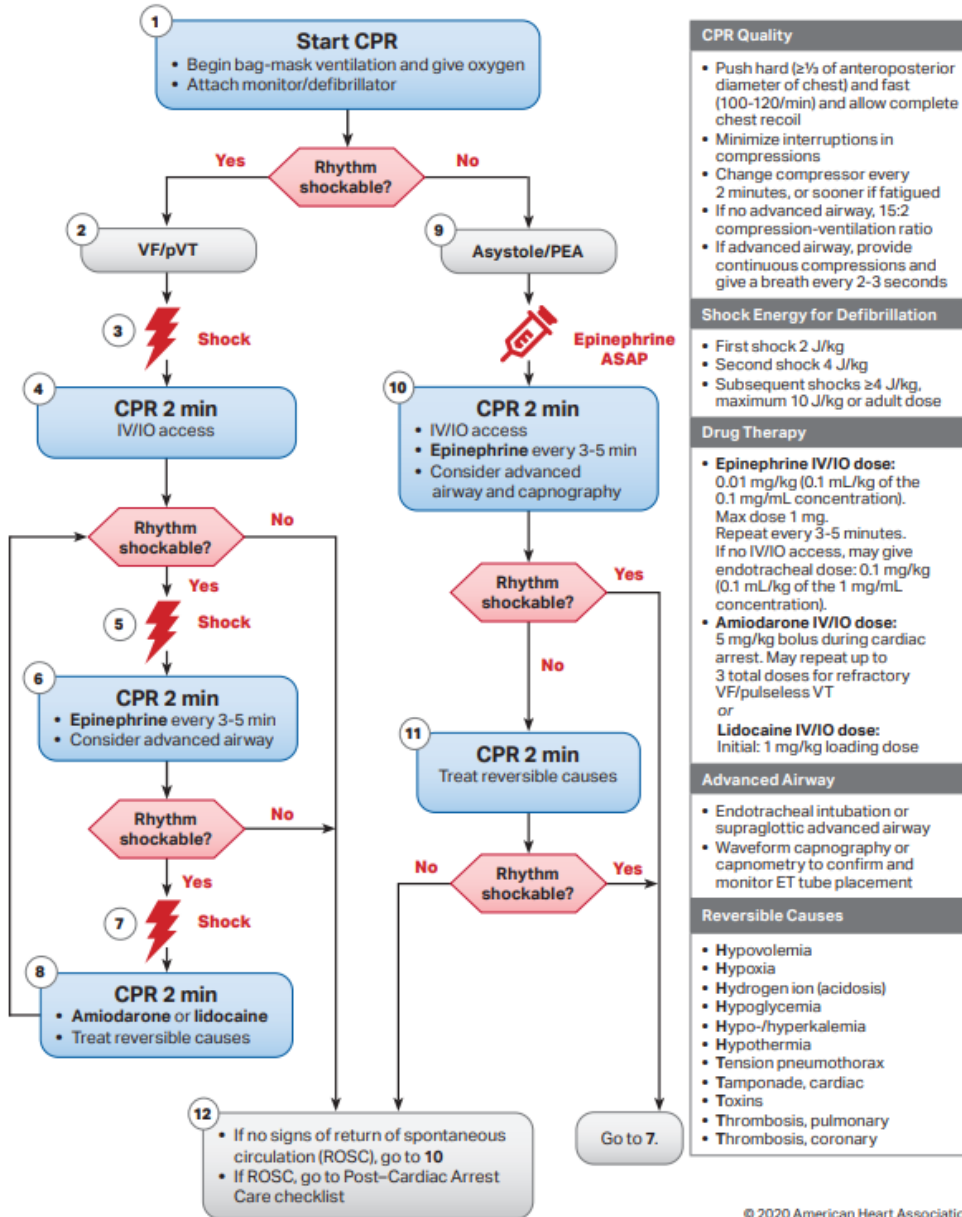


Pearls:

- The majority of pediatric arrests are due to air way problems. Airway may be the most important intervention.
- Go to post-resuscitation protocol if return of spontaneous circulation occurs at any point.

Pediatric Cardiac Arrest AHA

Pediatric Cardiac Arrest Algorithm



CPR Quality

- Push hard ($\geq \frac{1}{2}$ of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Change compressor every 2 minutes, or sooner if fatigued
- If no advanced airway, 15:2 compression-ventilation ratio
- If advanced airway, provide continuous compressions and give a breath every 2-3 seconds

Shock Energy for Defibrillation

- First shock 2 J/kg
- Second shock 4 J/kg
- Subsequent shocks ≥ 4 J/kg, maximum 10 J/kg or adult dose

Drug Therapy

- Epinephrine IV/IO dose:** 0.01 mg/kg (0.1 mL/kg of the 0.1 mg/mL concentration). Max dose 1 mg. Repeat every 3-5 minutes. If no IV/IO access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of the 1 mg/mL concentration).
- Amiodarone IV/IO dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 3 total doses for refractory VF/pulseless VT or
- Lidocaine IV/IO dose:** Initial: 1 mg/kg loading dose

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

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Pediatric Pulseless Arrest

Doses/Details for the Pediatric Cardiac Arrest Algorithm

CPR Quality

- Push hard ($\geq 1/3$ of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 15:2 compression-ventilation ratio. If advanced airway, 8-10 breaths per minute with continuous chest compressions

Shock Energy for Defibrillation

First shock 2 J/kg,
second shock 4 J/kg,
subsequent shocks ≥ 4 J/kg,
maximum 10 J/kg or adult dose.

Drug Therapy

- **Epinephrine IO/IV Dose:**
0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes. If no IO/IV access, may give endotracheal dose:
0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
- **Amiodarone IO/IV Dose:**
5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6-8 seconds (8-10 breaths per minute).

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

Pediatric Hypotension/ Shock (Non-Trauma)

History:

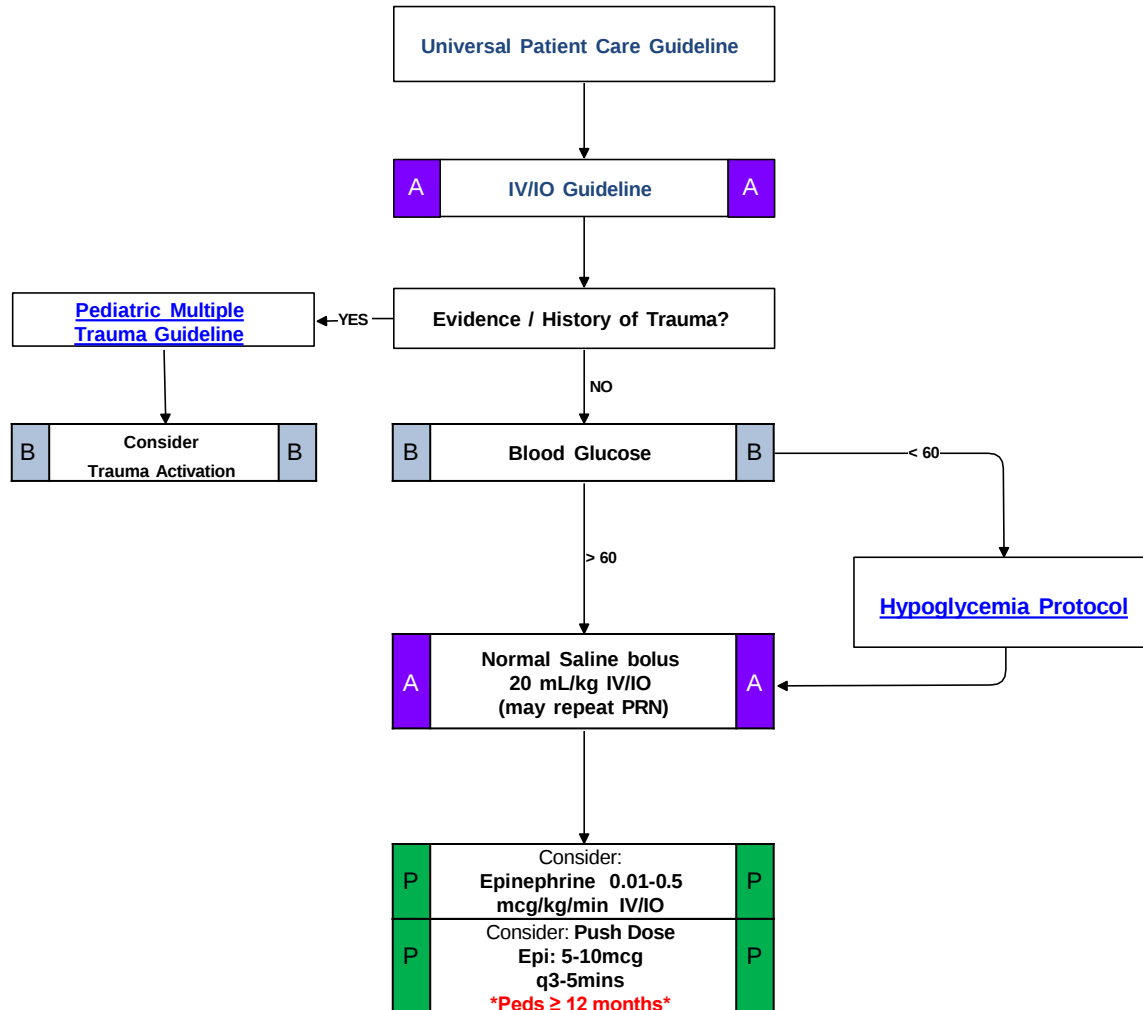
- Blood loss
- Fluid loss
 - Vomiting
 - Diarrhea
 - Fever
 - Infection

Signs and Symptoms:

- Restlessness, confusion, weakness
- Dizziness
- Increased HR, rapid pulse
- Decreased BP
- Pale, cool, clammy skin
- Delayed capillary refill

Differential:

- Trauma
- Infection
- Dehydration
 - Vomiting
 - Diarrhea
 - Fever
- Congenital heart disease
- Medication or Toxin



Pearls:

Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neurological

- Consider all possible causes of shock and treat per appropriate protocol.
- Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.
- Most maternal medications pass through breast milk to the infant. Examples: Narcotics, Benzodiazepines.

Pediatric Tachycardia with a Pulse

History:

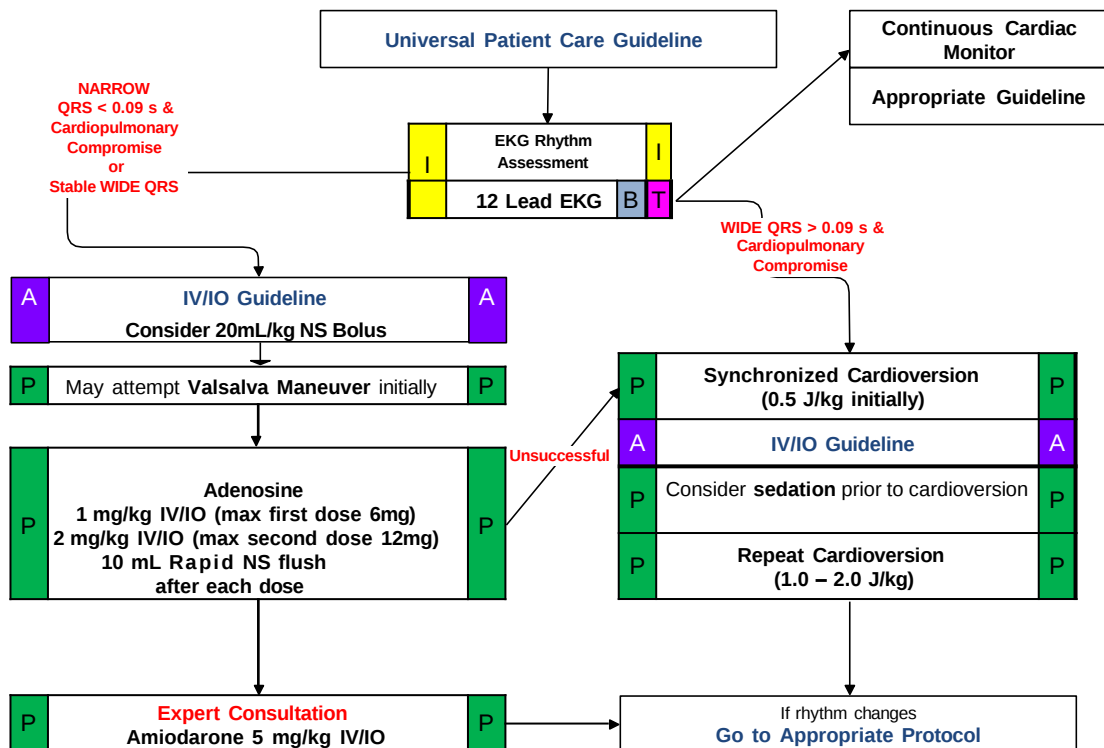
- Past medical history
- Medications or Toxic Ingestion (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Drugs (nicotine, cocaine)
- Congenital Heart Disease
- Respiratory Distress
- Syncope or Near Syncope

Signs and Symptoms:

- Heart Rate: Child > 180 bpm
Infant > 220 bpm
- Pale or Cyanosis
- Diaphoresis
- Tachypnea
- Vomiting
- Hypotension
- Altered Level of Consciousness
- Pulmonary Congestion
- Syncope

Differential:

- Heart disease (Congenital)
- Hypo / Hyperthermia
- Hypovolemia or Anemia
- Electrolyte imbalance
- Anxiety / Pain / Emotional stress
- Fever / Infection / Sepsis
- Hypoxia
- Hypoglycemia
- Medication / Toxin / Drugs (HIST)
- Pulmonary embolus
- Trauma
- Tension Pneumothorax



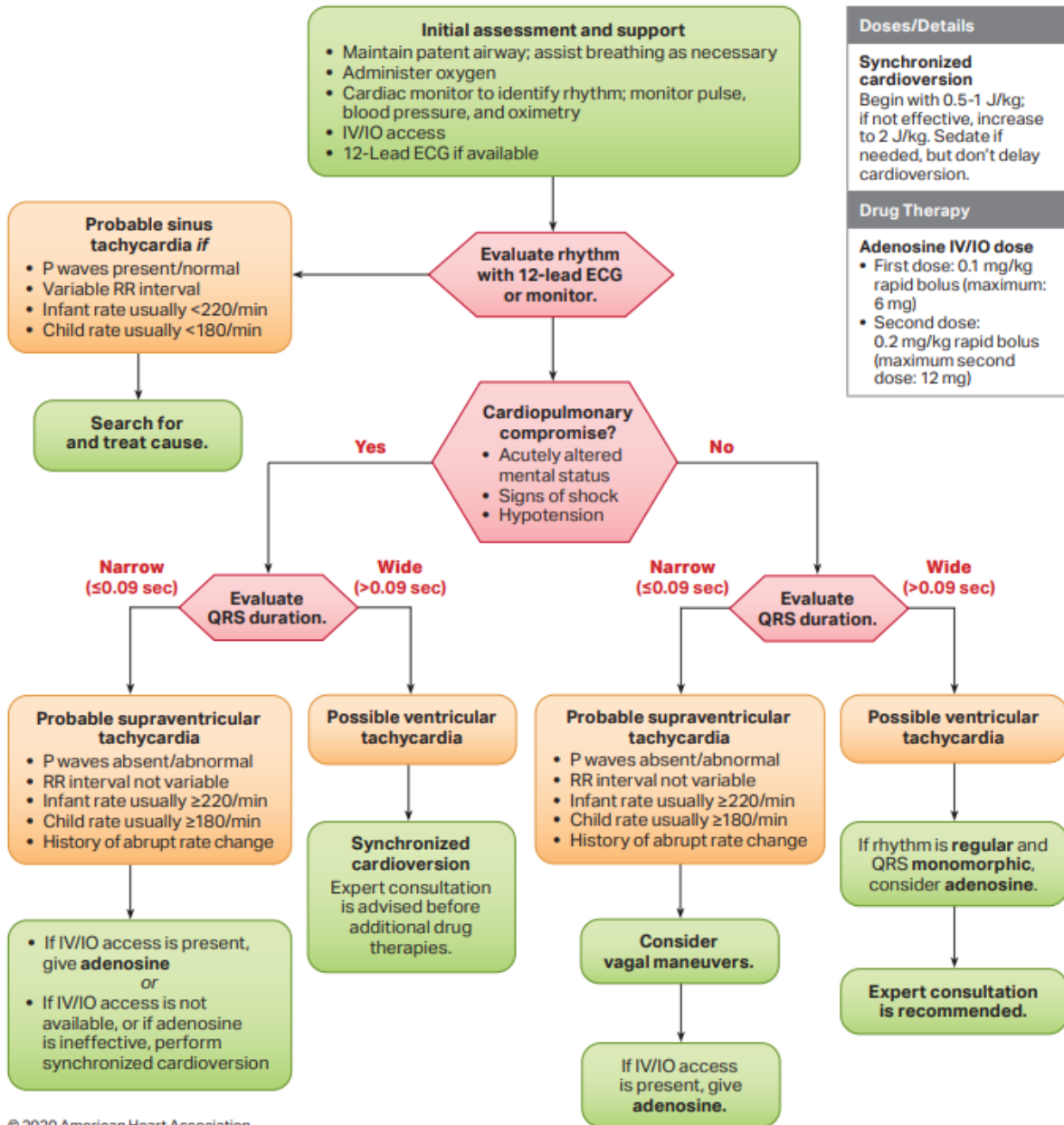
Pearls:

Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neurological

- Carefully evaluate the rhythm to distinguish Sinus Tachycardia, Supraventricular Tachycardia, and Ventricular Tachycardia. **Probable Sinus Tachycardia: Child < 180 bpm, Infant < 220 bpm.**
- Use the appropriate size defibrillation pads per regulation recommendations.
- Monitor for respiratory depression and hypotension associated if Versed is used.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention. As a rule of thumb, the maximum sinus tachycardia rate is: 220 - patient age in years.

Pediatric Tachycardia's AHA

Pediatric Tachycardia With a Pulse Algorithm



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Pediatric Allergic Reaction

History

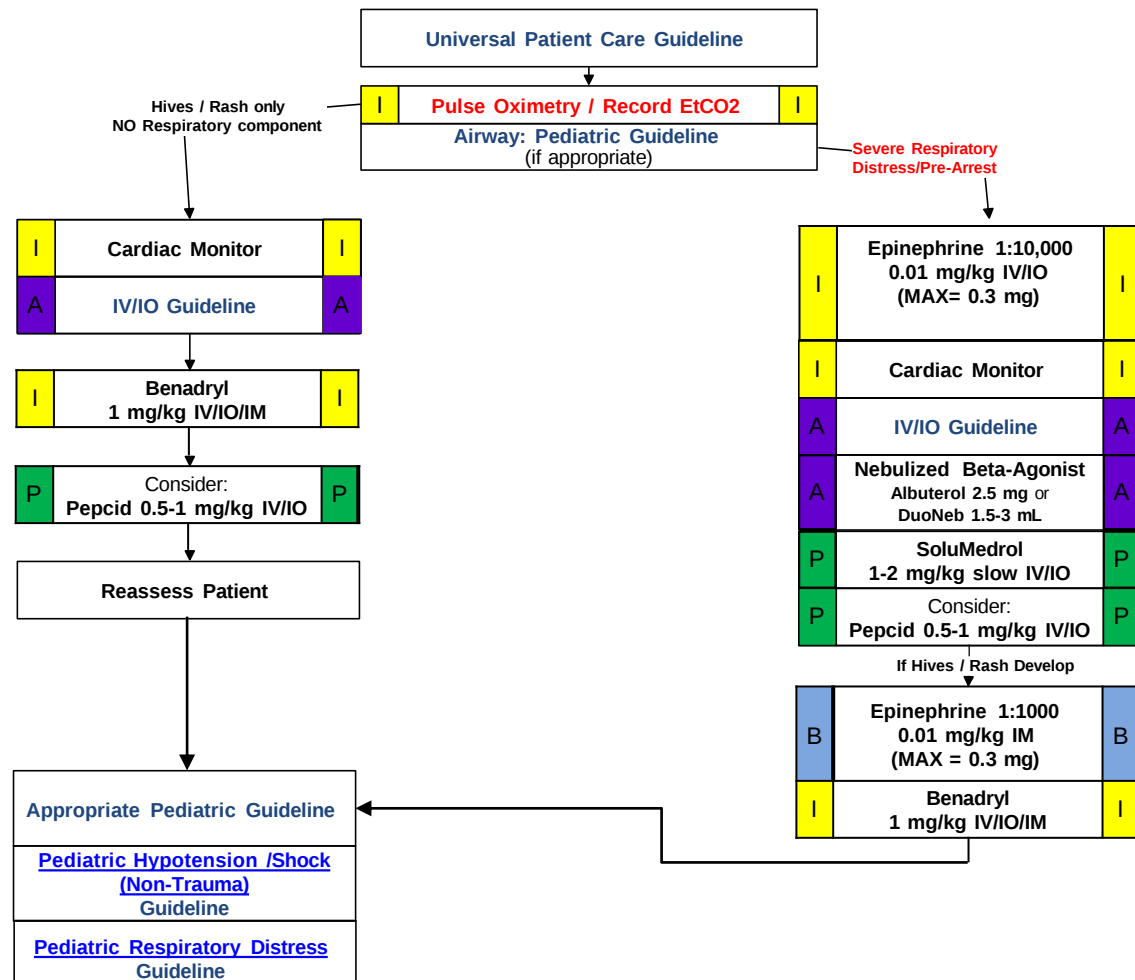
- Onset and location
- Insect sting or bite
- Food allergy / exposure
- Medication allergy / exposure
- New clothing, soap, detergent
- Past history of reactions
- Past medical history
- Medication history

Signs and Symptoms:

- Itching or hives
- Coughing / wheezing or respiratory distress
- Chest or throat constriction
- Difficulty swallowing
- Hypotension or shock
- Edema

Differential:

- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration / Airway obstruction
- Vasovagal event
- Asthma or COPD
- CHF



Pearls:

Exam: Mental Status, Skin, Heart, Lungs

- If hives present near or around the airway (cheeks, neck, etc), treat as if the patient is experiencing angioedema/airway swelling.
- Intramuscular Epi should be considered early and first line treatment in all allergic reactions. If you are unsure of anaphylaxis, err on the side of caution and treat as if it is.
- Severe allergic reactions may also cause the patient to go into distributive shock and cause fatal hypotension.

Pediatric Altered Mental Status

History:

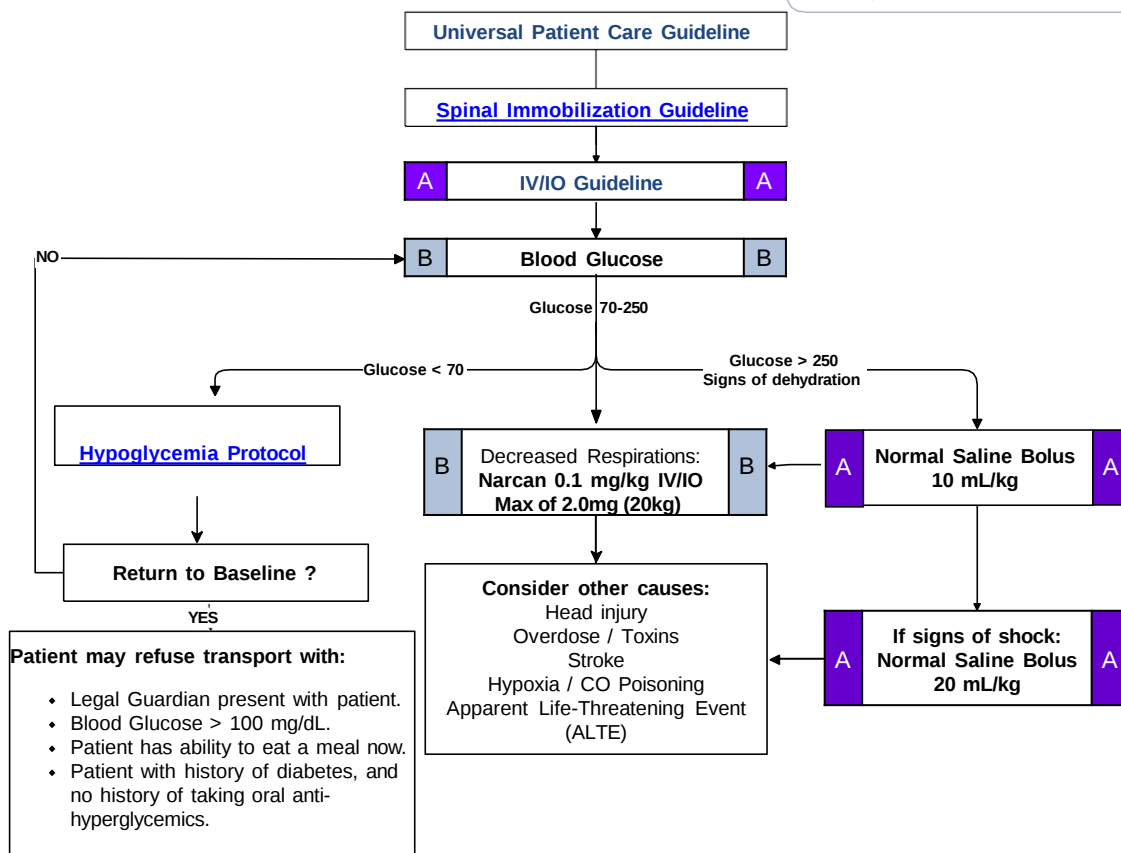
- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma

Signs/Symptoms:

- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmaul respirations; signs of dehydration)

Differential:

- Head trauma
- CNS (stroke, tumor, seizure, infection)
- Cardiac (MI, CHF)
- Infection
- Thyroid (hyper / hypo)
- Shock (septic, metabolic, traumatic)
- Diabetes (hyper / hypoglycemia)
- Toxicologic
- Acidosis / Alkalosis
- Environmental exposure
- Pulmonary (Hypoxia)
- Electrolyte abnormality
- Psychiatric disorder



Pearls:

- **Exam:** Mental Status, HEENT, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neurological
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- **Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.**
- However, use with extreme caution and consider chemical sedation first or contact medical control.

Pediatric Vomiting/Nausea

History:

- 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 / diarrhea

Signs and Symptoms:

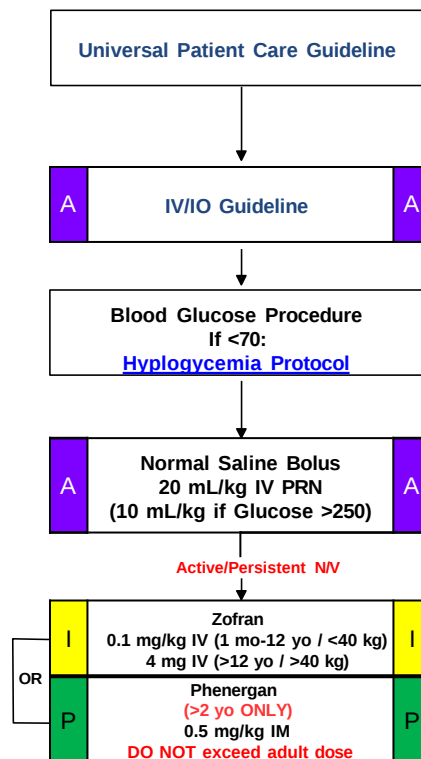
- Pain
- Character of pain (constant, intermittent, sharp, dull, etc.)
- Distention
- Constipation
- Diarrhea
- Anorexia

Associated symptoms: (Helpful to localize source)

- Fever
- Headache
- Blurred vision
- Weakness
- Malaise
- Myalgias
- Cough
- Headache
- Dysuria
- Mental status changes
- Rash

Differential:

- CNS (increased pressure, headache, stroke, CNS lesions, trauma or hemorrhage, vestibular)
- Myocardial infarction
- Drugs (NSAID's, antibiotics, narcotics, chemotherapy)
- GI or Renal disorders
- Diabetic ketoacidosis
- Gynecologic disease (ovarian cyst, PID)
- Infections (pneumonia, influenza)
- Electrolyte abnormalities
- Food or toxin induced
- Medication or Substance abuse
- Pregnancy
- Psychological



Pearls:

Exam: Mental Status, Skin, HEENT, Neck, Heart, Lungs, Abdomen, Back, Extremities, Neuro

- Frequent re-assessments are needed to monitor vascular status.

Newly Born

History:

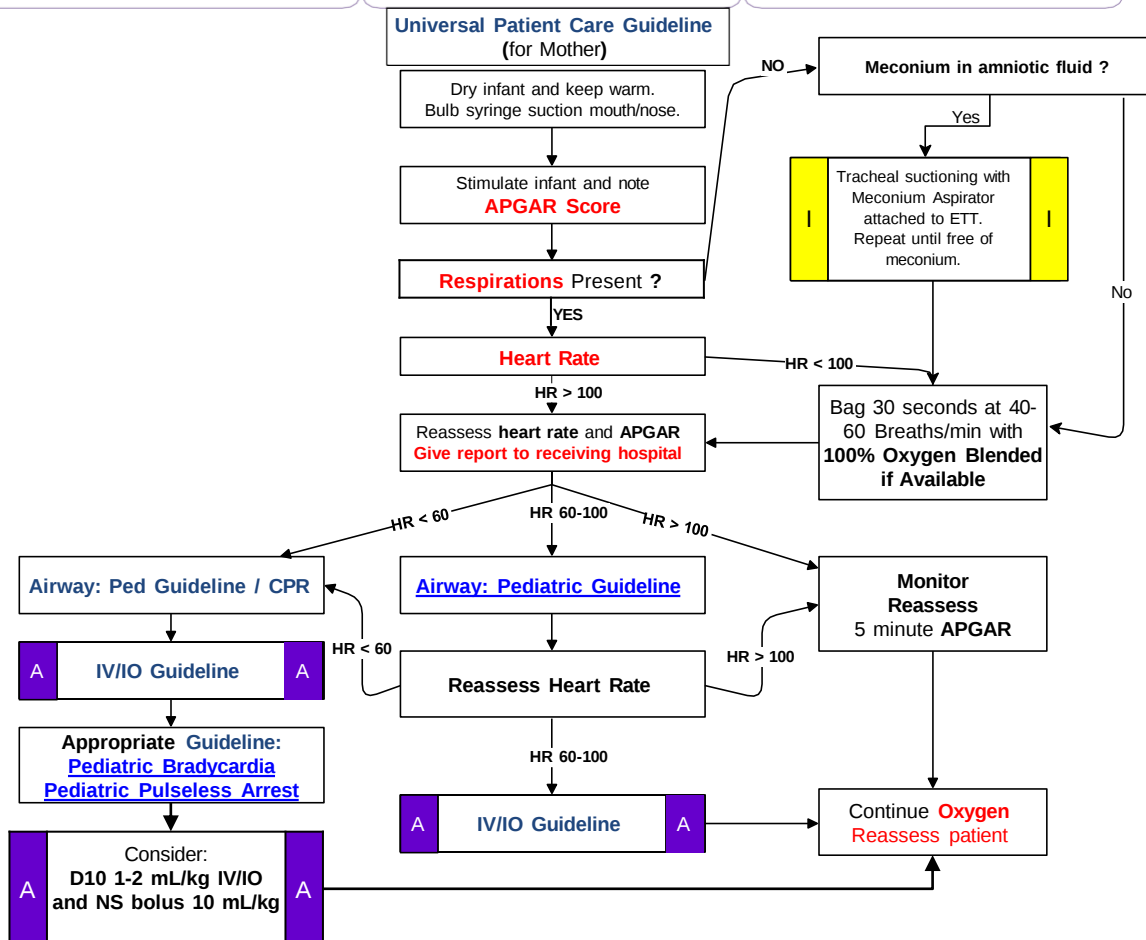
- Due date and gestational age
- Multiple gestation (twins etc.)
- Meconium
- Delivery difficulties
- Congenital disease
- Medications (maternal)
- Maternal risk factors
 - Substance abuse
 - Smoking

Signs and Symptoms:

- Respiratory distress
- Peripheral cyanosis or mottling (normal)
- Central cyanosis (abnormal)
- Altered level of responsiveness
- Bradycardia

Differential:

- Airway failure
 - Secretions
 - Respiratory drive
- Infection
- Maternal medication effect
- Hypovolemia
- Hypoglycemia
- Congenital heart disease
- Hypothermia



Pearls:

- CPR in infants is 120 compressions/minute with a 3:1 compression to ventilation ratio.
- It is extremely important to keep infant warm.
- Maternal sedation or narcotics will sedate infant.
- Remember MR. SOAP: Mask adjustment, Reposition airway, Suction, Open mouth, Airway device, and pressure. This will help remedy most neonate's respiratory status and low heartrate.
- Document 1 and 5 minute APGAR score in PCR.
- **NRP no longer recommends routine suctioning with meconium. Only due so with respiratory distress.**

Pediatric Overdose/ Toxic Ingestion

History:

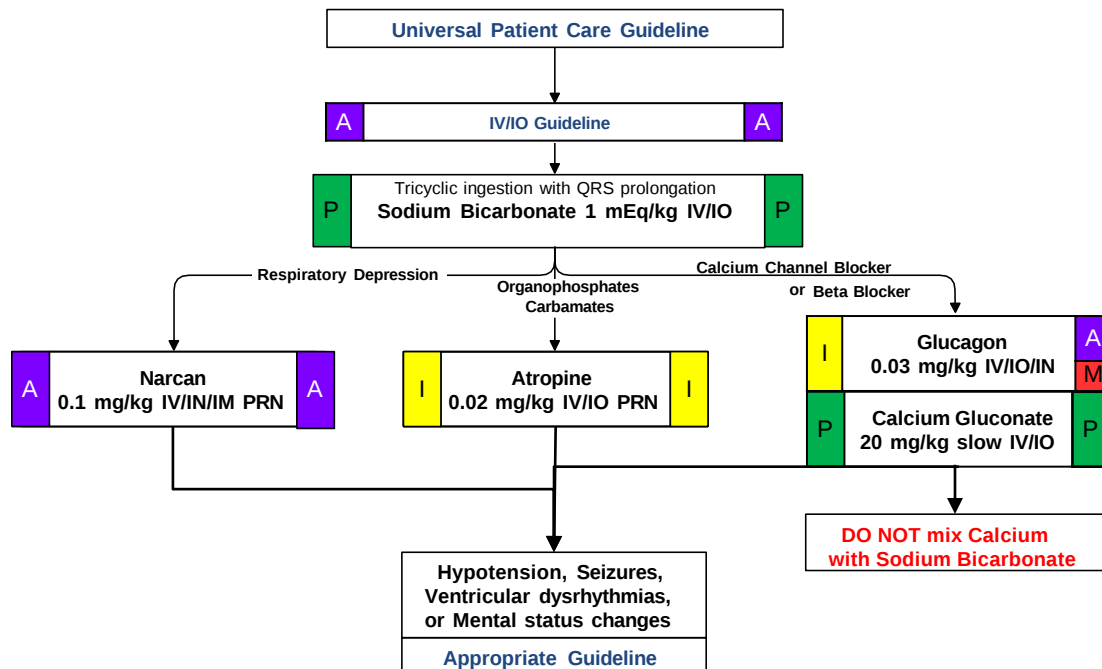
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications

Signs and Symptoms:

- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures

Differential:

- Tricyclic antidepressants (TCAs)
- Acetaminophen (tylenol)
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)



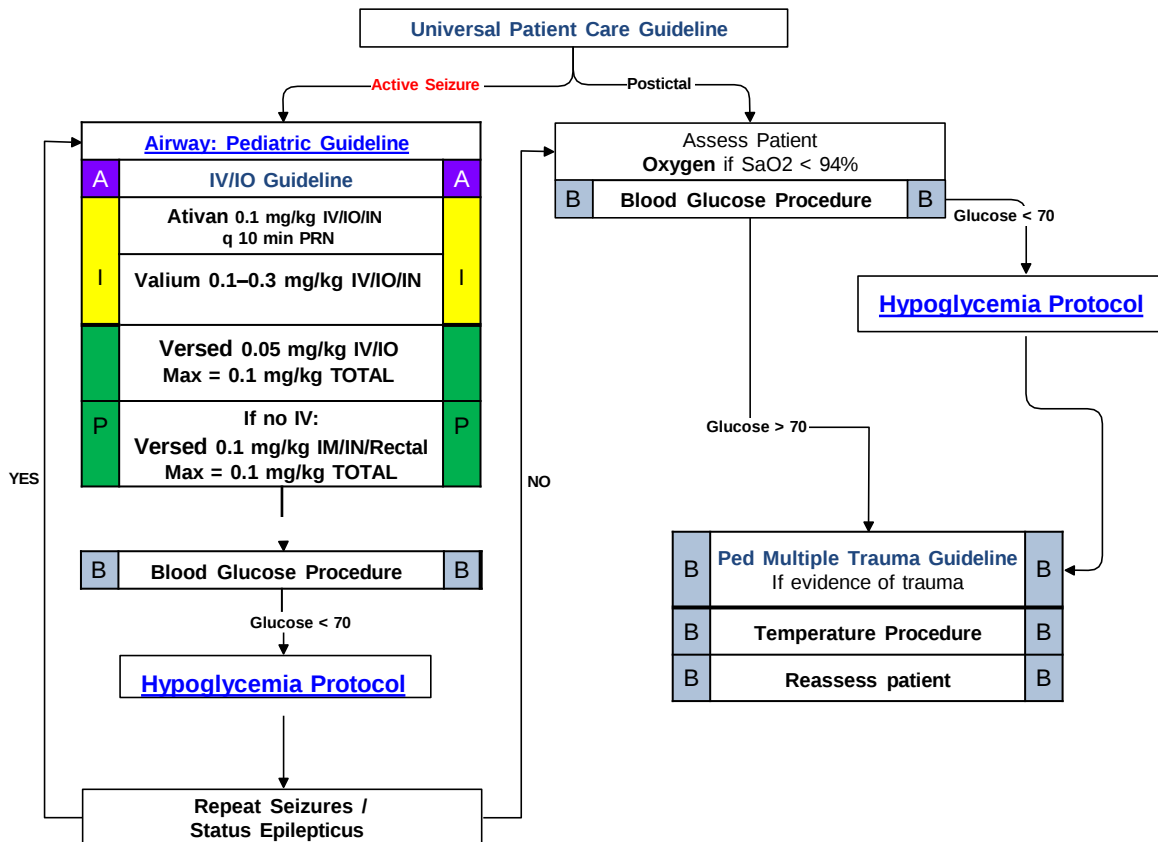
Pearls:

- **Maximum doses: Narcan 2 mg, Glucagon 1 mg, Calcium Gluconate 1 gram, Sodium Bicarbonate 50 mEq, Atropine 2 mg/dose (minimum = 0.1 mg).**
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, emesis to ED.
- Tricyclic: 4 major areas of toxicity: seizures, dysrhythmias, hypotension, decreased mental status or coma; rapid progression from alert mental status to death.
- Acetaminophen: initially normal or nausea/vomiting. If not detected and treated, causes irreversible liver failure.
- Depressants: decreased HR, decreased BP, decreased temperature, decreased respirations, non-specific pupils.
- Stimulants: increased HR, increased BP, increased temperature, dilated pupils, seizures.
- Anticholinergic: increased HR, increased temperature, dilated pupils, mental status changes.
- 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.
- Charcoal may not be administered by NG Tube. If charcoal is given PO and the patient has decreasing mental status, an NG tube may be placed if needed to assist with airway protection.
- Consider restraints if necessary for patient's and/or personnel's protection per the Restraint Procedure.
- **Consider contacting the Wyoming Poison Control Center for guidance. 1-800-222-1222**

- Epilepsy
- Fever
- Ingestion
- Diabetes
- Congenital Disorder
- CNS Tumor
- Trauma

- Observed seizure activity
- Altered mental status
- Hot, dry skin or elevated body temperature

- Fever
- Infection
- Head trauma
- Medication or Toxin
- Hypoxia or Respiratory failure
- Hypoglycemia
- Metabolic abnormality / acidosis
- Tumor



Pearls:

- **Status epilepticus is defined as two or more successive seizures without a period of consciousness or recovery or a seizure lasting longer than five minutes.** This may require 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.
- **Jacksonian seizures** are seizures which start as a focal seizure and be come generalized.
- Be prepared to assist ventilations especially if a benzodiazepine is used. Avoiding hypoxemia is extremely important.
- If febrile, remove clothing and sponge with room temperature water.
- **A seizure may be the only evidence of a closed head injury.**

Pediatric Burns

History:

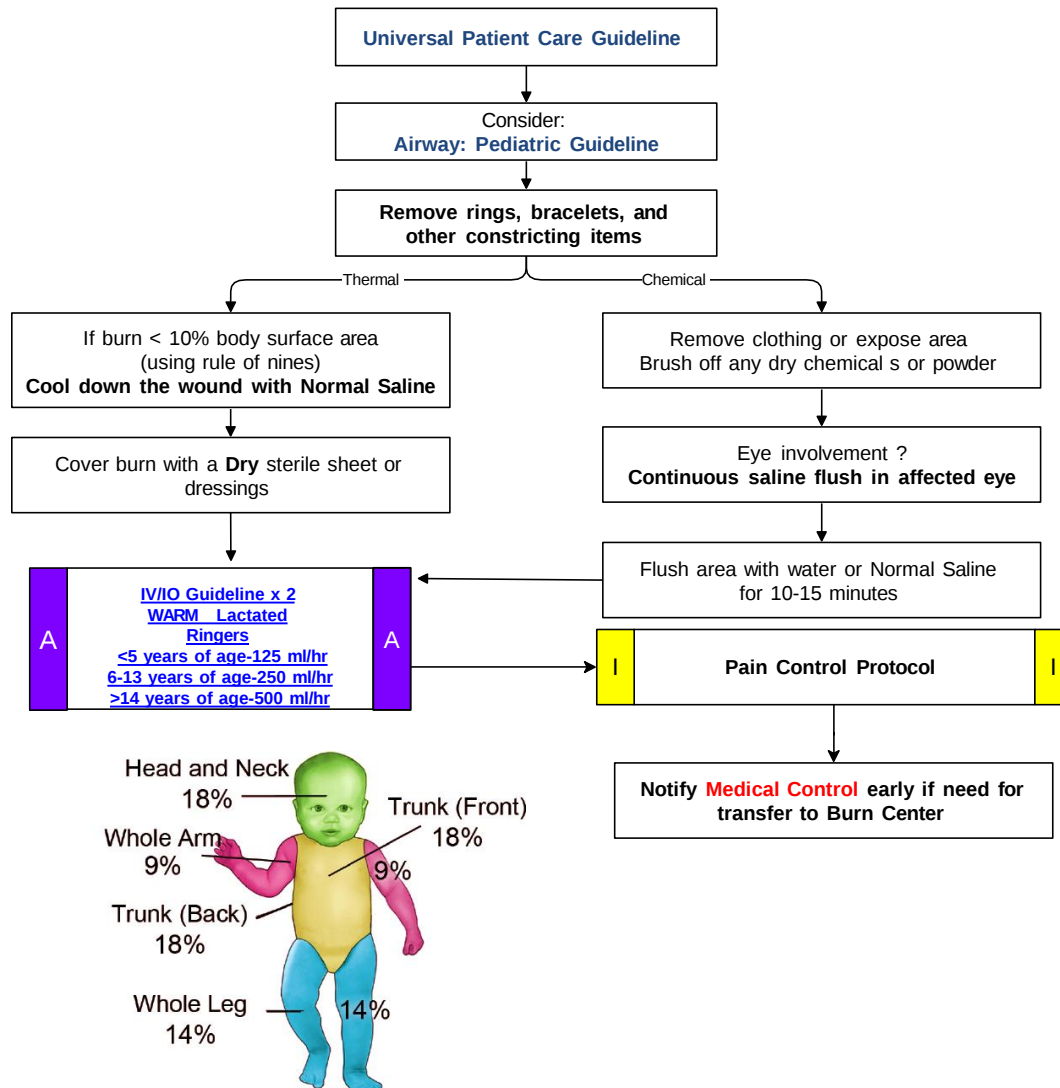
- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness
- Tetanus/Immunization status

Signs and Symptoms:

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension / shock
- Airway compromise / distress
- Singed facial or nasal hair
- Hoarseness / wheezing

Differential:

- Superficial (1°) red and painful
- Partial thickness (2°) blistering
- Full thickness (3°) painless and charred or leathery skin
- Chemical
- Thermal
- Electrical
- Radiation



Pearls:

- If Airway involvement, notify **Medical Control** of need for burn center transfer.
- Critical Burns: >20% body surface area (BSA) age > 10; >10% BSA age < 10; 3° burns >5% BSA; 2° and 3° burns to face, eyes, hands or feet; electrical burns; respiratory burns; deep chemical burns; burns with extremes of age or chronic disease; and burns with associated major traumatic injury. These burns may require hospital admission or transfer to a burn center.
- Early intubation is required in inhalation injuries.
- Potential CO exposure should be treated with 100% oxygen.
- Circumferential burns are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - Never apply ice or cool burns that involve >10% body surface area.
- Do not overlook the possibility of multiple system trauma.
- Do not overlook the possibility for child abuse with children sustaining burn injuries.

Pediatric Extremity Trauma

History:

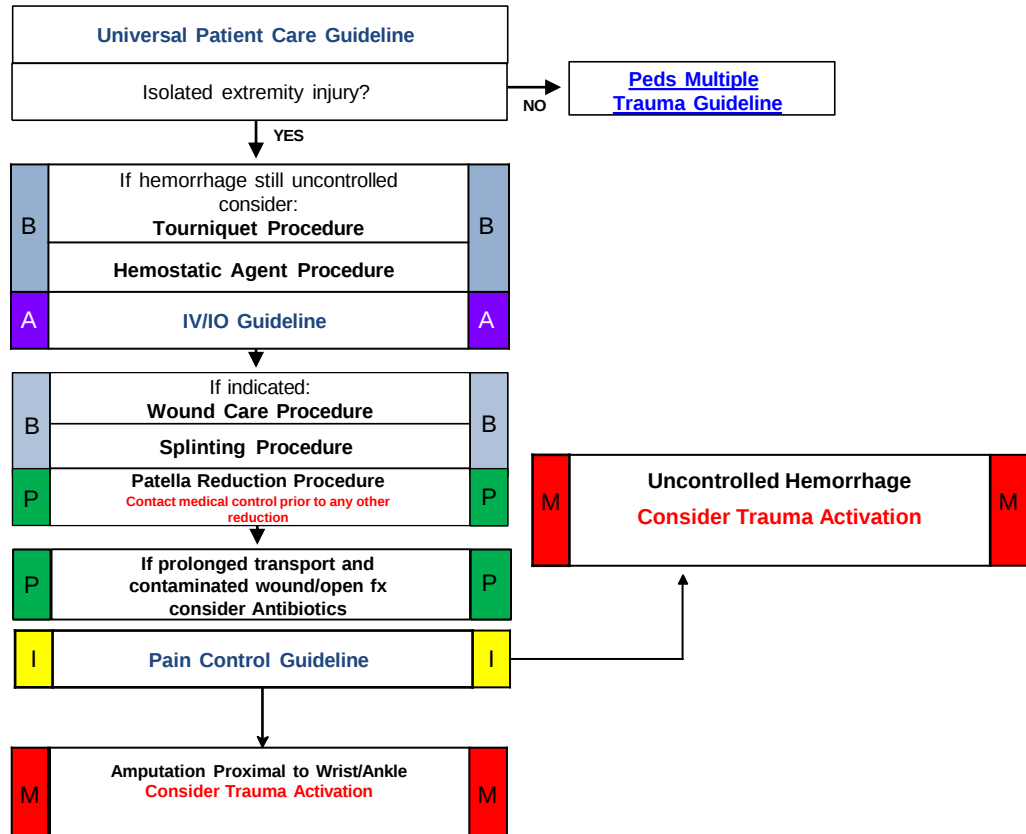
- Type of injury
- Mechanism: crush / penetrating / amputation
- Time of injury
- Open vs. closed wound / fracture
- Wound contamination
- Medical history
- Medications

Signs and Symptoms:

- Pain, swelling
- Deformity
- Altered sensation / motor function
- Diminished pulse / capillary refill
- Decreased extremity temperature

Differential:

- Abrasion
- Contusion
- Laceration
- Sprain
- Dislocation
- Fracture
- Amputation



Pearls:

Exam: Mental Status, Extremity, Neurological

- In amputations, time is critical. Transport and notify **Medical Control** immediately.
- Hip dislocations and knee and elbow fracture / dislocations have a high incidence of vascular compromise. Urgently transport any injury with vascular compromise.

Pediatric Head Trauma

History:

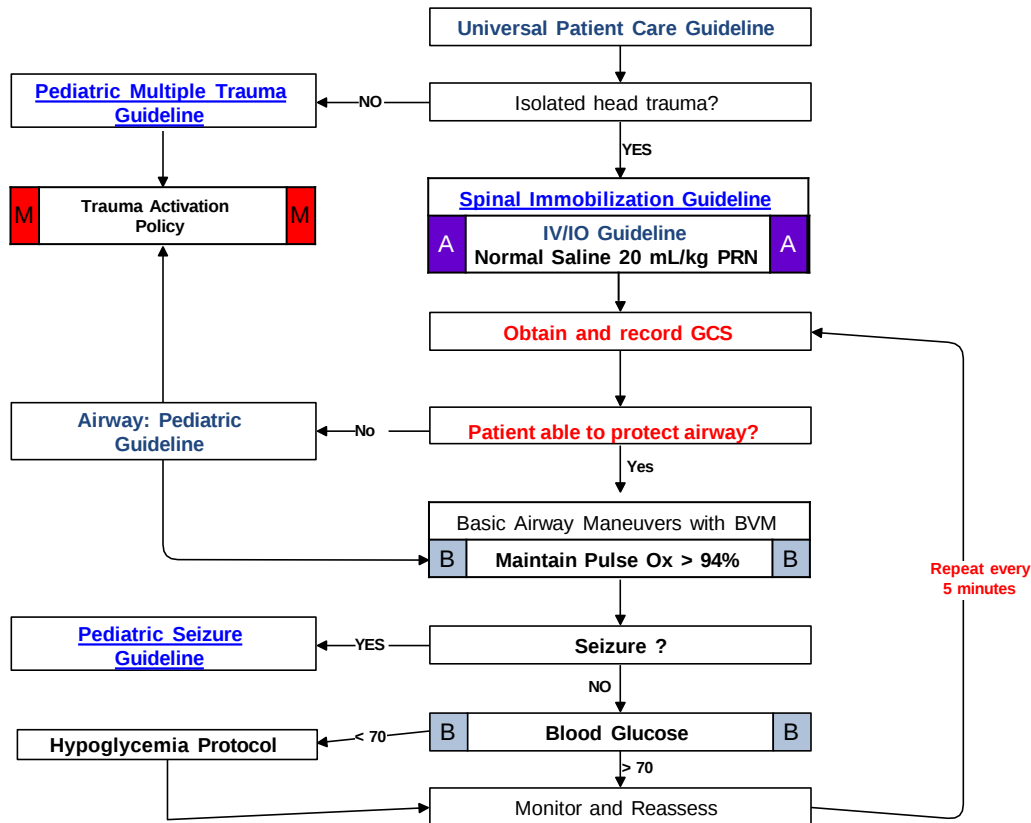
- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

Signs and Symptoms:

- Pain, swelling, bleeding
- Altered mental status
- Unconscious
- Respiratory distress / failure
- Vomiting
- Major traumatic mechanism of injury
- Seizure

Differential:

- Skull fracture
- Brain injury (Concussion, Contusion, Hemorrhage or Laceration)
- Epidural hematoma
- Subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury
- Abuse



Pearls:

Recommended Exam: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremities, Back, Neurological.

- If GCS < 12 consider air / rapid transport and if GCS < 8 intubation should be anticipated.
- In a patient with a GCS < 8 and a stable mid-face, nasotracheal intubation may be considered.
- Attempt to maintain a EtCO₂ of 30-40mmHg, do not hyperventilate the patient.
- Increased intracranial pressure (ICP) may cause wide pulse-pressure and bradycardia (Cushing's Response).
- Hypotension usually indicates injury or shock unrelated to the head injury.
- The most important item to monitor and document is a 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 prolonged confusion or mental status abnormality which does not return to normal within 15 minutes or any documented loss of consciousness should be evaluated by a physician ASAP.

Pediatric Multisystem Trauma

History:

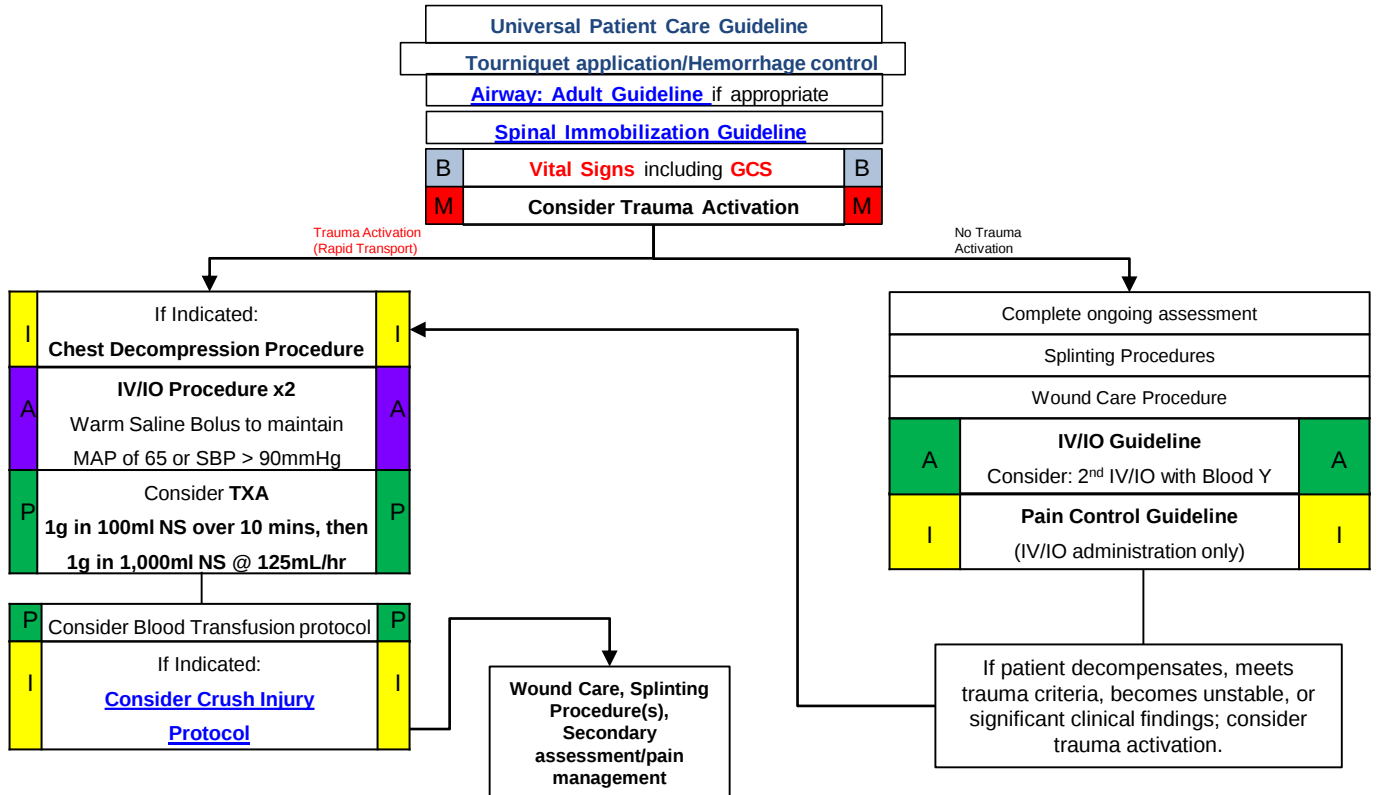
- Time and mechanism of injury
- Damage to structure or vehicle
- Location in structure or vehicle
- Others injured or dead
- Speed and details of MVC
- Restraints / Protective equipment
 - Car seat
 - Helmet
 - Pads
- Ejection
- Past medical history
- Medications

Signs and Symptoms:

- Pain, swelling
- Deformity, lesions, bleeding
- Altered mental status
- Unconscious
- Hypotension or shock
- 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



Pearls:

Exam: Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neurological

- Examine all restraints / protective equipment for damage.
- Severe bleeding from an extremity not rapidly controlled may necessitate the application of a tourniquet.
- Do not overlook the possibility of child abuse.

P

Acetaminophen

Guideline: [Pain Control](#)

Indications: Fever, Pain Control

Class: Analgesic/Antipyretic

MOA: Inhibiting the synthesis of prostaglandins in the Central nervous system.

Contraindications: Anaphylaxis, hypoventilation

SE: N/V, loss of appetite, stomach pain, difficulty urinating

Route: IV/IO/PO

Adult dose: 1g over 15 mins

Pediatric dose 2 years or 50kg: 15 mg/kg PO or IV/IO max 750 mg
Contraindicated under 2 years

P

Adenosine (Adenocard)

Guideline: [SVT, V-Tach / Wide Complex Tachycardia with a pulse](#)

Indications: SVT, Stable Wide Complex Tachycardia with a pulse

Class: Anti-Arrhythmic

MOA: Slows the conduction of electrical impulses at the AV node

Contraindications: A-Fib or a-flutter, 2nd or 3rd degree AV block or SSS

SE: Facial flushing, dyspnea, HA, N/V, chest pressure, dizziness, diaphoresis, hypotension, palpations, and chest, jaw or neck pain

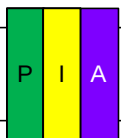
Route: IV/IO

Adult dose: First dose → 6 mg rapid IV/IO push followed by 10 mL NS flush

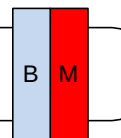
Second dose → 12 mg rapid IV/IO push followed by 10 mL NS flush, if required

Pediatric dose: First dose → 0.1 mg/kg rapid IV/IO push (max 6 mg)

Second dose → 0.2 mg/kg rapid IV/IO push (max 12 mg), if required



Albuterol & Xopenx



Guideline: [Respiratory Distress, Hyperkalemia](#)

Indications: Asthma, bronchitis with bronchospasm, and COPD

Class: Bronchodilator

MOA: Stimulates beta₂-adrenergic receptors in lungs, resulting in relaxation of bronchial smooth muscle. Reduces bronchospasm and reduces airway resistance

Contraindications: Hx of hypersensitivity to sympathomimetics, tachydysrhythmias
CAUTION with HTN, CVD, hyperthyroidism and diabetes

SE: HA, N/V, restlessness, nervousness, tremors, dizziness, throat dryness and irritation. May increase risk of arrhythmias with Digoxin

Route: NEB

Adult dose: Nebulizer→ 2.5 mg in 3 mL unit-dose vial PRN

MDI→ 4-8 puffs via inhalation q 20 minutes PRN with spacer

Hyperkalemia: 2.5mg every 3-5mins. No maximum dosage

Pediatric dose: MDI→ 4-8 puffs via inhalation q 20 minutes PRN with spacer (OR ET if intubated)

Nebulizer→ 2.5 mg/dose q 20 minutes PRN

Continuous Neb.→ 0.5 mg/kg/hr via inhalation (max 20 mg/hr)

P I

Amiodarone (Cordarone)

Guideline: [V-Tach / Wide Complex Tachycardia with a Pulse](#), [V-Fib / Pulseless V-Tach](#), [A-Fib/A-Flutter \(WIDE\)](#)

Indications: VF / pulseless VT, VT with a pulse,

A-Fib/Flutter with RVR

Class: Anti-Arrhythmic

MOA: Acts directly on the myocardium to delay re-polarization and increase the duration of the action potential (Rate Control)

Contraindications: Bradycardia, hypersensitivity, 2nd and 3rd degree AV block, prolonged QT interval, severe hepatic disease, severe sinus node dysfunction, and hypersensitivity to iodine

SE: Hypotension, Bradycardia, MI, NV, increased QTc and muscular incoordination.

Route: IV/IO, Infusion (DRIP)

Adult dose: First dose→ 300 mg IV/IO bolus

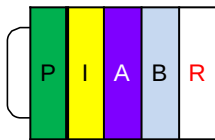
Second dose→ 150 mg IV/IO bolus

Rapid Infusion→ 150 mg in 100 mL NS over 10 minutes

Maint. Infusion→ 1 mg/min (1.5 mg/mL) for first 6 hours

Pediatric dose: First dose→ 5 mg/kg IV/IO bolus (max 300 mg), repeat to daily max 15 mg/kg

Infusion→ 5 mg/kg IV/IO load over 20-60 minutes (max 300 mg), repeat to daily max 15 mg/kg



Aspirin (ASA)

Guideline: [Chest pain](#)

Indications: Angina, AMI

Class: Anti-Platelet

MOA: Prevents the formation of thromboxane A2 (TXA2) which causes platelets to aggregate, and form plugs that causes obstruction/constriction of small coronary arteries

Contraindications: Bleeding disorders, GI bleeding or ulceration, hepatic impairment, and Hx of hypersensitivity to ASA and NSAID's. Use caution in asthma

SE: GI distress, cramping, heartburn, mild nausea and allergic reaction

Route: PO

Adult dose: 324 mg (4x 81 mg chewable tablets) PO

Pediatric dose: Contraindicated

P I

Atropine Sulfate (Atropine)

Guideline: [Bradycardia](#), [Organophosphate Poisoning](#), [Pediatric Intubation](#), [RSI \(Peds\)](#), [Nerve Agent Exposure](#)

Indications: Symptomatic bradycardia, AV block, and antidote for organophosphate pesticides

Class: Anti-Cholinergic

MOA: Competes with acetylcholine for common binding sites on muscarinic receptors located on exocrine glands, cardiac muscle, smooth muscle ganglia, and intramural neurons (blocks vagal tone)

Contraindications: Tachycardia, glaucoma.

CAUTION in presence of MI and hypoxia (increases myocardial O₂ demand). Avoid in hypothermic bradycardia

SE: Dry mouth, nose, throat, decreased diaphoresis, constipation and blurred vision/dilated pupils; tachycardia

Route: IV/IO

Adult dose: Bradycardia → 1.0 mg IV/IO bolus, repeat every 3-5 minutes (max 3 mg)

Cholinergic Poisoning → 2-6 mg IV/IO/IM every 2-5 minutes until muscarinic symptoms are reversed

Pediatric dose: Bradycardia → 0.02 mg/kg IV/IO (min dose 0.1 mg, max single dose child 0.5 mg, max single dose adolescent 1 mg), may repeat dose once; max total dose child 1 mg, max total dose adolescent 3 mg

Cholinergic Poisoning → [<12 years]: 0.02-0.05 mg/kg IV/IO initially, then repeat IV/IO q 20-30 minutes until muscarinic symptoms reverse

[>12 years]: 2 mg IV/IO initially, then 1-2 mg IV/IO q 20-30 minutes until muscarinic symptoms reverse

P

Calcium Gluconate/Chloride

Guideline: [Asystole / PEA](#), [Bradycardia](#), [V-Fib / Pulseless V-Tach](#), [Hyperkalemia](#), [Hydrofluoric Acid Exposure](#)

Indications: Overdose of calcium channel blockers and beta blockers, acute hypocalcemia, cardiac arrest hyperkalemia, and blood transfusion

Class: Electrolyte

MOA: Increase in myocardial contractility and ventricular automaticity; positive inotropic effect

Contraindications: Digoxin toxicity, Hypercalcemia and VF (unless hyperkalemia suspected)

SE: Rash, flushing, feeling of warmth, N/V, diaphoresis and hypotension

Route: IV/IO

Adult dose: 500-1000 mg slow IV/IO over 5-10 minutes

Pediatric dose: (10%) 20 mg/kg (0.2 mL/kg) slow IV/IO during arrest, repeat PRN

P

Clopidogrel (Plavix)

Guideline: [Chest Pain](#)

Indications: STEMI/Non-STEMI, ACS , Replacement for Aspirin if allergic to Aspirin

Class: Antiplatelet

MOA: Irreversibly binds active metabolite to the P2Y12 class of ADP receptors on platelets.

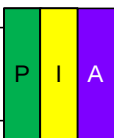
Contraindications: Peptic ulcers, intracranial bleeding

SE: Bleeding, itching, eczema, bruising, diarrhea, skin redness

Route: Oral

Adult dose: 300 mg PO. If patient is older than 75, dose is limited to 75 mg.

Pediatric dose: Not recommended



Dextrose

Guideline: [Altered Mental Status](#), [Hypoglycemia](#)

Indications: Hypoglycemia

Class: Anti-Hypoglycemic

MOA: Increases blood glucose concentrations

Contraindications: Known hemorrhagic CVA, DTs

SE: Hyperglycemia, warmth, burning, pain and thrombosis of the peripheral veins; tissue necrosis if extravasation occurs

Route: IV/IO

Adult dose: (D50%) 25 g (50 mL) IV/IO
D10% Titrate to Effect

Pediatric dose: 0.5-1.0 g/kg
(D25%) 2-4 mL/kg – IV/IO
(D10%) 5 – 10 mL/kg – IV/IO
Titrate to Effect

	Dextrose (grams)	Solution (ml)	BLEND	Location
	25	50	D50%	Abboject in truck cabinet
	25	100	D25%	Blend
Preferred	50	500	D10%	IV Drip in jump kit
	25	200	D12.5%	Blend



Diazepam (Valium)

Guideline: [Pain Control](#), [Seizure](#), [Behavioral](#), [Back Pain](#)

Indications: Anxiety, skeletal muscle relaxation, ETOH withdrawal, seizures; sedation prior to cardioversion

Class: Benzodiazepine

MOA: Depressing CNS with anticonvulsive and sedative properties

Contraindications: Coma, CNS depression, hypotension, respiratory depression, head injury

SE: Drowsiness, fatigue, ataxia, orthostatic hypotension, respiratory depression, HA and NV

Route: IV/IO/IN

Adult: 5-10 mg slow IV/IO/IN, may repeat q 5 minutes

Pediatric dose: 0.1-0.3 mg/kg slow IV/IO/IN, may repeat q 5 minutes, <5 years max 5 mg, >5 years max 10 mg

P

Diltiazem (Cardizem)

Guideline: [Supraventricular Tachycardia](#), [Atrial Fibrillation](#)

Indications: A-Fib/A-Flutter RVR

Class: Calcium Channel Blocker

MOA: Inhibits Ca⁺ movement across cardiac cell membranes, slows conduction in AV node (rate control). Causes dilation of coronary arteries, peripheral arteries and arterioles

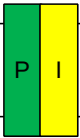
Contraindications: Acute MI, 2nd or 3rd degree AV block, severe hypotension, Sick sinus syndrome, and known CHF

SE: Hypotension, peripheral edema, dizziness, light headedness, HA, bradycardia

Route: IV/IO

Adult dose: 0.25mg/kg (max of 20mg) over 3-5mins, may repeat after 15mins at 0.35mg/kg (max of 25mg) over 3-5mins , then 5 mg/hr drip titrated by 5 mg/hr to a max of 20 mg/hour for controlled heart rate.

Pediatric dose: Contraindicated



Diphenhydramine (Benadryl)

Guideline: [Allergic Reaction](#), [Behavioral](#), [Nausea/Vomiting](#), [Severe Dizziness/ Vertigo](#)

Indications: Allergic reactions, motion sickness, extrapyramidal reactions, N/V

Class: Antihistamine

MOA: Binds and blocks H₁ histamine receptors

Contraindications: Hypersensitivity, pregnancy, nursing mothers

SE: Hypotension, HA, drowsiness, use caution with acute asthma patients – may thicken secretions, may have a paradoxical effect on children causing an excitable state, urinary retention in elders

Route: IV/IO/IM

Adult dose: 25-50 mg IV/IO/IM

Pediatric Dose: 1-2 mg/kg IV/IO/IM q 4-6 hours (max single dose 50 mg)

P

Dopamine (Intropin)

Guideline: [Bradycardia](#), [Hypotension](#), [Hypothermia](#)

Indications: 2nd-line drug for symptomatic bradycardia and hypotension (non-trauma shock and post-resuscitation), non-trauma pediatric hypotension

Class: Adrenergic agonist

MOA: Stimulates alpha and beta adrenergic receptors, at moderate doses (2-10 mcg/kg/min) stimulates beta₁ receptors resulting in increased inotropic and increased cardiac output

Contraindications: Hypovolemic shock, HTN

SE: Tachycardia, angina, N/V, arrhythmias, skin and soft tissue necrosis, correct hypovolemia with fluid replacement before initiating dopamine, use caution in cardiogenic shock with CHF

Route: IV/IO, Infusion (DRIP)

Adult dose:

Premix 400 mg in 250 mL D5W (1600mcg/mL):

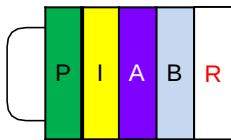
→ 2-10 mcg/kg/min using a 60 drop set titrate to BP>90 systolic

Renal → 2-5 mcg/kg/min

Inotropic → 2-10 mcg/kg/min

Pressor → 10-20 mcg/kg/min

Pediatric dose: 1-5 mcg/kg/min, increased to 5-20 mcg/kg/min as needed. **Epinephrine typically preferred over dopamine.**



Epinephrine 1:1,000

Guideline: [Allergic Reaction](#), [Respiratory Distress](#), [Hypotension](#)

Indications: Anaphylaxis and allergic reactions with respiratory compromise

Class: Adrenergic agonist

MOA: Binds with alpha and beta receptors, producing increased BP, increased HR, and bronchodilation

Contraindications: Extreme tachycardia, tachydysrhythmias

SE: Anxiety, HA, HTN, tremors, N/V, use caution in patients with previous cardiac Hx and tachycardia

Route: IM/SQ

Anaphylaxis dosages:

Adult dose: 0.3-0.5 mg IM

EpiPen (>60 lbs/27 kg) 0.3 mg IM Auto-Injector

Pediatric dose: 0.01 mg/kg SQ/IM q 15 minutes PRN (max single dose 0.3 mg)

EpiPen Jr. (<60 lbs/27 kg) 0.15 mg IM Auto-Injector

0.1 mg/kg ET q 3-5 minutes

Respiratory distress:

Nebulized Epinephrine:

0.5mg/kg of 1:1,000 Epi max of 5mg (5mL) add NS to total 5ml for nebulization

Hypotension:

Push-Dose Epi:

0.1mg (0.1mL) of 1:1,000 in a 10mL Flush- push in increments of 0.5-2mL or 5-20mcg PRN

Epi Drip:

1mg (1mL) of 1:1,000 in a 1L NS bag and use at a rate of 2-20mcg/min

P I

Epinephrine 1:10,000

Guideline: [Allergic Reaction](#), [Asystole / PEA](#), [Bradycardia](#), [V-Fib / Pulseless V-Tach](#), [Hypotension](#)

Indications: Cardiac arrest, anaphylaxis

Class: Adrenergic agonist

MOA: Binds with alpha and beta receptors, producing increased BP, increased HR, and bronchodilation

Contraindications: Extreme tachycardia, tachydysrhythmias

SE: Anxiety, HA, HTN, tremors, N/V, use caution in patients with previous cardiac Hx and tachycardia

Route: IV/IO

Adult dose: Bolus→ 1 mg IV/IO q 3-5 minutes

Anaphylaxis→ 0.1 mg IV/IO

Infusion→ 2-20 mcg/min IV/IO

Pediatric dose: Bolus→ 0.01 mg/kg (0.01 mL/kg of 1:10,000 standard concentration) IV/IO q 3-5 minutes

Anaphylaxis→ 0.01 mg/kg (0.01 mL/kg of 1:10,000 standard concentration) IV/ IO q 3-5 minutes (max single dose 1 mg) if hypotensive

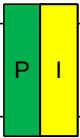
Infusion→ 0.1-1 mcg/kg/min IV/IO

Push-Dose Epi:

0.1mg (1mL) of 1:10,000 in a 9mL Flush- push in increments of 0.5-2mL or 5-20mcg PRN

Epi Drip:

1mg (10mL) of 1:10,000 in a 1L NS bag



Nebulized Epinephrine

Guideline: [Respiratory Distress](#)

Indications: [Respiratory Distress](#)

Class: Adrenergic agonist

MOA: Alpha and beta receptor stimulator, reduction in mucous

Contraindications: [Cardiac disease, HTN and sulfate sensitivity](#)

SE: Anxiety, dizziness, HA, tachycardia, tremors, N/V

Route: Neb

Adult dose: 5mL of 1:1,000 epi nebulized every 3-5mins

Pediatric dose: 0.5mg/kg of 1:1,000 epi (max of 5mL) added with NS to equal 5mL nebulized, may repeat every 3-5mins.

Use lower end of dosing range for infants/neonates

P

Etomidate (Amidate)

Guideline: [RSI](#), [Drug Assisted Intubation](#)

Indications: RSI induction, induction of anesthesia

Class: Hypnotic, anesthesia induction agent

MOA: GABA like effects, exact mechanism unknown

Contraindications: DO NOT use during labor or for nursing mothers; only use in pregnancy if benefits outweigh risk

SE: Hypotension, respiratory depression, N/V, arrhythmias, laryngospasm

Route: IV/IO

Adult dose: 0.2-0.6 mg/kg IV/IO o 30-60 seconds

Pediatric dose: 0.2-0.4 mg/kg IV/IO infused o 30-60 seconds (max 20 mg) will produce rapid sedation that lasts for 10-15 minutes for RSI

P

Famotidine (Pepcid)

Guideline: [Allergic reactions](#), [Vomiting / Nausea](#)

Indications: Allergic reactions, N/V

Class: Antihistamine

MOA: Competitively inhibits action of histamine at the H2 receptor sites decreasing gastric acid secretion

Contraindications: Hypersensitivity

SE: Palpitations, flushing, tinnitus, dizziness, constipation, anorexia, dry mouth

Route: IV/IO

Adult dose: 20 mg IV/IO

Pediatric dose: 0.5-1 mg/kg IV/IO

P I

Fentanyl (Sublimaze)

Guideline: [Pain Control](#), [RSI Adult](#), [RSI Pediatric](#), and [Head Trauma Protocol](#)

Indications: Pain

Class: Narcotic analgesic

MOA: Binds to opiate receptors

Contraindications: MAOI use, asthma, myasthenia gravis, respiratory depression
CAUTION in TBI

SE: Respiratory depression, hypotension, N/V, dizziness, bradycardia, palpitations

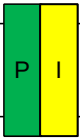
Route: IV/IO/IM/IN

Adult dose: 1-2 mcg/kg slow IV/IO/IM/IN, (max 200 mcg)

Analgesia maintenance drip 0.5-1 mcg/kg/hr

For analgesia maintenance drip mix 100mcg in a 100 bag creating a 1mcg/mL concentration

Pediatric dose: 1-2 mcg/kg slow IV/IO/IM/IN, (max 75 mcg)



Furosemide (Lasix)

Guideline: [Pulmonary Edema](#)

Indications: Pulmonary edema, CHF

Class: Non-potassium sparing loop diuretic

MOA: Inhibits the absorption of Na, chloride ions and water in the loop of Henle

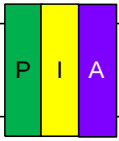
Contraindications: Known sensitivity to sulfonamides or Furosemide

SE: Hypotension, vertigo, dizziness, hypokalemia

Route: IV/IO

Adult dose: 20-80 mg slow IV/IO, (max 80 mg if pt taking home Lasix)

Pediatric dose: Not recommended



Glucagon (Glucagen)

Guideline: [Hypoglycemia](#), [Bradycardia](#), [Beta-Blocker OD](#), [Overdose/ Toxic Ingestion](#)

Indications: Hypoglycemia, beta-blocker overdose, Ca-channel blocker overdose

Class: Hormone

MOA: Converts glycogen to glucose in the liver stimulating glucose synthesis

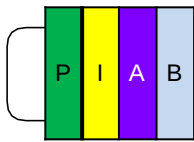
Contraindications: Pheochromocytoma, insulinoma

SE: N/V, HTN, tachycardia Route: IV/IO/IM/IN

Adult dose: Hypoglycemia → 1 mg IM/IN

Beta-Blocker/Ca-Channel Blocker OD → 5 mg IV/IO over 1 min, may repeat after 10 minutes.

Pediatric dose: Hypoglycemia → 0.025 mg/kg IM/IN



Glucose (Glucose15)

Guideline: [Hypoglycemia](#)

Indications: Hypoglycemia

Class: Carbohydrate, hypertonic solution

MOA: Distributed into tissues & provides a prompt increase in circulating blood sugar

Contraindications: Inability to follow commands and swallow

Route: PO

Adult dose: 15 g PO (1 tube)

Pediatric dose: 15 g PO (1 tube)

P

Haloperidol Lactate (Haldol)

Guideline: [Behavioral / Agitated Delirium](#)

Indications: Behavioral/agitated delirium

Class: Antipsychotic

MOA: Selectively blocks post-synaptic dopamine receptors

Contraindications: CNS depression, coma, Parkinson's disease;
CAUTION with elderly and ETOH abuse

SE: Hypotension, tachycardia, HTN, drowsiness, respiratory depression

Route: IM/IV

Adult dose: 5-10 mg IM/IV

Pediatric dose: Not recommended

P I

Heparin

Guideline: [Chest Pain](#)

Indications: STEMI/Non-STEMI, ACS

Class: Anticoagulant

MOA: Potentiates the inhibitory effect of antithrombin on factor Xa and thrombin.

Contraindications: Hypersensitivity; Uncontrolled bleeding; Severe thrombocytopenia; Open wounds

SE: Drug-induced hepatitis, bleeding, heparin-induced thrombocytopenia (HIT), anemia.

Route: IM/IV

Adult dose:

Heparin bolus 60 units/kg (Max of 4,000 units)

Heparin drip 12 units/kg/hr (25,000 units in 500 ml)

Pediatric dose: Not recommended

P

Ibuprofen

Guideline: [Fever, Pain Control](#)

Indications: [Fever, mild-to-moderate pain](#)

Class: Antipyretic / Analgesic

MOA: non-selective, reversible inhibition of the cyclooxygenase enzymes COX-1 and COX-2 (coded for by PTGS1 and PTGS2, respectively).

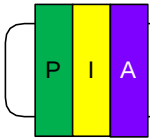
Contraindications: [GI Bleeding, asthma sensitive to NSAIDs](#)

SE: N/V, HTN, tachycardia

Route: PO

Adult dose: 600-800 mg orally

Pediatric dose: 10 mg/kg orally



Ipratropium Bromide (DuoNeb)

Guideline: [Respiratory Distress](#)

Indications: Asthma, bronchospasm associated with COPD

Class: Anticholinergic, bronchodilator

MOA: Antagonizes the acetylcholine receptor on bronchial smooth muscle, producing bronchodilation

Contraindications glaucoma

SE: Paradoxical bronchospasm, cough, headache, dizziness, dry mouth, palpitations

Route: Neb

Adult dose: 0.5 mg in 3 mL NS nebulized x3 doses MAX (may be mixed with Albuterol)

**Pediatric dose: 0.25 - 0.5 mg in 1.5 - 3 mL nebulized q 20 minutes PRN x3 doses MAX
(may be mixed with Albuterol)**

P

Ketamine HCl (Ketalar)

Guideline: [Airway: RSI](#), [Pain Control](#), [Behavioral/ Agitated Delirium](#)

Indications: Facilitate intubation, sedation/analgesia

Class: Dissociative anesthetic/analgesic

MOA: Probable NMDA antagonist contributing to central amnestic, analgesic, and anesthetic properties, may also relax smooth muscle tissues (bronchodilation)

Contraindications: Hypersensitivity, CAUTION with known psychosis or PTSD; for sedation in patients under 3 months old

SE: HTN, tachycardia, profound salivation, hallucinations, emergence reactions

Route: Analgesia: IN/IV/IO

RSI: IV/IO

Adult dose: Analgesia: 0.1-0.3 mg/kg IN/IV/IO, may repeat

Pain control maintenance drip 0.1-0.5 mg/kg/hr titrate to effect

For pain control maintenance drip mix 100mg in a 100 bag creating a 1mg/mL concentration

RSI: 1-2 mg/kg IV/IO

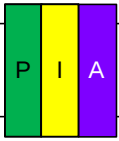
1-2 mg/kg/hr IV/IO drip using 1 mg/mL

Pediatric dose: Analgesia: 0.5-1 mg/kg IN/IV/IO may repeat in 10 minutes x1

RSI: [>12 years OR longer than Broselow tape]

1-2 mg/kg IV/IO q 20 minutes

1-2 mg/kg/hr IV/IO drip using 1 mg/mL



Lidocaine (Xylocaine)

Guideline: [Airway: Drug Assisted Intubation](#), [IV/IO](#), [Narrow / Wide Complex Tachycardia](#), [V-Fib /Pulseless V-Tach](#)

Indications: V-Fib/Pulseless V-tach, RSI with head trauma, IO insertion

Class: Anti-Arrhythmic, Sodium channel blocker

MOA: Blocks sodium channels increasing recovery period after repolarization

Contraindications: 2nd or 3rd degree AV block, hypotension

SE: Cardiac arrhythmias, hypotension, bradycardia, seizures

Route: IV/IO, Infusion (DRIP)

Adult dose: First dose→ 1-1.5 mg/kg IV/IO bolus

Second dose→ 0.5-0.75 mg/kg IV/IO bolus

Infusion→ 1-4 mg/min

Post-IO Insertion→ 40 mg IO bolus over 120 seconds; allow to dwell for 60 seconds; flush with 5ml saline; push second dose, half the volume of first, over 60 seconds.

Pediatric dose: First dose→ 1-1.5 mg/kg IV/IO bolus

Second dose→ 0.5-0.75 mg/kg IV/IO bolus

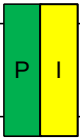
Infusion→ 20-50 mcg/kg/min IV/IO infusion (repeat bolus dose if infusion initiated >15 minutes after initial bolus)

Post-IO Insertion→ 1 mg/kg IO bolus slowly, MAX 40 mg; same technique as adult.

DO NOT EXCEED ADULT DOSE

Lidocaine IV Drip (Premix: 2 g/500 mL; 4 mg/mL)

Microdrops/min = mg/min with 60 gtt/mL drip set



Lorazepam (Ativan)

Guideline: [Pain Control](#), [Seizure](#), [Behavioral](#), [Pulmonary edema](#), [Respiratory Distress](#)

Indications: Seizures, status epilepticus, management of agitation associated with sympathomimetic overdose or sedative withdrawal, long-acting sedation, CPAP and BiPAP tolerance

Class: Benzodiazepine

MOA: Depressing CNS with anticonvulsive and sedative properties. Onset of action is 2-5 minutes with duration of 16 hours

Contraindications: Hypotension, coma, CNS depression, respiratory depression, head injury

SE: Respiratory depression, hypotension, drowsiness, fatigue, ataxia, HA and N/V

Route: IV/IO/IN/IM

Adult dose: 1-2 mg slow IV/IO/IN q 10 minutes PRN; MAX 1 mL per nare IN.

Pediatric dose: 0.1 mg/kg slow IV/IO/IN q 10 minutes PRN; MAX 1 mL per nare IN.

P

Magnesium Sulfate (MgSO₄)

Guideline: [V-Tach/Wide Complex Tach with a Pulse](#), [V-Fib/Pulseless V-Tach](#), [Obstetrical Emergency](#), [Respiratory Distress](#)

Indications: Eclamptic seizures, polymorphic VT (torsades de pointes), respiratory distress

Class: Electrolyte

MOA: Reduces striated muscle contractions and blocks peripheral neuromuscular transmission

Contraindications: AV block, respiratory depression, known hypocalcemia, renal failure, shock

SE: Diaphoresis, hypotension, muscle paralysis, weakness, hypothermia

Route: IV/IO, Infusion (DRIP)

Adult dose: Magnesium Sulfate 10% IV/IO Drip

Torsades de Pointes and V-Tach with a pulse:

2 grams Magnesium Sulfate run over 10 minutes

Torsades de Pointes and V-Tach without a pulse:

2 grams Magnesium Sulfate IV push

Preeclampsia/Eclampsia:

5 grams Magnesium Sulfate run over 20 minutes

Status asthmatics:

2 grams Magnesium Sulfate over 10 minutes

Pediatric dose:

Pulseless VT → 25-50 mg/kg IV/IO bolus (max 2 g)

VT with pulse → 25-50 mg/kg IV/IO over 10-20 minutes

Status asthmaticus → 25-50 mg/kg IV/IO over 15-30 minutes

P

Methylprednisolone (Solu-Medrol)

Guideline: [Allergic Reaction](#), [Respiratory Distress](#)

Indications: Anaphylaxis, asthma, COPD

Class: Corticosteroid

MOA: synthetic steroid that suppresses acute and chronic inflammation. In addition, it potentiates vascular smooth muscle relaxation by beta adrenergic agonists

Contraindications: Cushing's syndrome, measles, GI bleed, known sensitivity

SE: Depression, headache, restlessness, hypertension, bradycardia, N/V/D, swelling

Route: IV/IO

Adult dose: 125 mg IV/IO bolus

Pediatric dose: 2 mg/kg IV/IO (max 60 mg)

P

Metoprolol (Lopressor)

Guideline: [Chest Pain, A-Fib/Flutter](#).

Indications: To reduce myocardial ischemia and damage in patient with acute MI

Class: Beta-blocker Agent

MOA: Beta-adrenergic blocking agent, Beta₁ blocking action on the heart decreasing heart rate, conduction velocity, myocardial contractility, and cardiac output.

Contraindications: CHF, acute pulmonary edema, 2nd and 3rd-degree heart blocks, hypotension, bradycardia

SE: Bradycardia, atrioventricular conduction delays, hypotension

Route: IV/IO

Adult dose: 5 mg IV/IO, may repeat x2

Pediatric dose: **Contraindicated**

P

Midazolam (Versed)

Guideline: [Behavioral / Agitated Delirium](#), [Cardioversion](#), [Respiratory distress](#), [Pulmonary Edema](#), [Seizure](#)

Indications: Sedation, anxiety, skeletal muscle relaxation

Class: Benzodiazepine

MOA: Enhances the inhibitory effects of GABA receptors on chloride channels in central nervous system, hyperpolarizing membrane. Induces sleep, decreases anxiety, and impairs memory retention (amnesia)

Contraindications: Acute narrow-angle glaucoma, pregnant women, hypersensitivity, depressed vital signs,

***CAUTION if patient has: barbiturates, alcohol, narcotics, or other CNS depressants already on board**

SE: Respiratory depression, respiratory arrest, hypotension, nausea/vomiting, headache, hiccups, cardiac arrest

Route: IV/IO/IM/IN

Adult dose: 2-5 mg q 10 min slow IV/IO/IN; MAX 0.1 mg/kg IV/IO/IM/IN

Pediatric dose

Procedural Sedation: 0.05-0.1 mg/kg q 10 min slow IV/IO/IM/IN; MAX 0.6 mg/kg IV/IO/IN

Seizures: 0.2 mg/kg slow IV/IO/IN/IM; MAX 5 mg per does; Max 2 total doses

DO NOT EXCEED ADULT DOSE



Morphine Sulfate

Guideline: [Chest Pain](#), [Pain Control](#)

Indications: Moderate to severe pain

Class: Opiate agonist

MOA: Narcotic analgesic

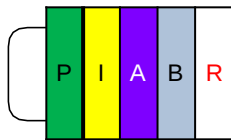
Contraindications: Respiratory depression, shock
CAUTION in hypotension and acute bronchial asthma

SE: Hypotension, tachycardia or bradycardia, palpitations, syncope, facial flushing, respiratory depression, euphoria, bronchospasm, allergic reaction

Route: IV/IO/IM

Adult dose: 2 - 5 mg IV/IO/IM PRN; MAX 20 mg

Pediatric dose: 0.1 mg/kg IV/IO/IM, may repeat in 10 minutes x1



Naloxone HCL (Narcan)

Guideline: [Altered Mental Status](#), [Overdose / Toxic Ingestion](#)

Indications: Narcotic OD/Misuse

Class: Narcotic Antagonist

MOA: Competitive inhibition at narcotic receptor sites, reverses respiratory depression secondary to opiate drugs, completely inhibits the effects of Morphine

Contraindications: None

Titrate SLOWLY for reversal of respiratory depression

Use with caution in narcotic-dependent patients

SE: Possible emesis/behavioral abnormalities with rapid administration

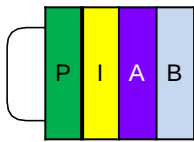
Route: IV/IO/IM/IN

Adult dose: 0.4-4 mg IV/IO/IM/IN PRN

For EMR & EMT: Give 2 mg IN PRN using commercially pre-filled, unit-dose auto injector or nasal MAD

Pediatric dose: 0.1 mg/kg IV/IO/IM/IN PRN

For EMR & EMT: Give 1 mg IN PRN using commercially pre-filled, unit-dose auto injector or nasal MAD



Nitroglycerin

Guideline: [Chest Pain](#), [Hypertension](#), [Pulmonary Edema](#)

Indications: Acute angina pectoris, ischemic chest pain, HTN, CHF, pulmonary edema

Class: Vasodilator

MOA: Smooth muscle relaxant acting on vascular, bronchial, uterine, and intestinal smooth muscle; dilation of arterioles and veins in the periphery; reduces preload and afterload; decreases the heart's work load, and thereby, myocardial oxygen demand

Contraindications: Hypotension, hypovolemia; intracranial bleeding or head injury; administration of Viagra, Revatio, Levitra, Cialis, or similar agents in last 24 hours. CAUTION with Inferior MI (fluid bolus first)

SE: Headache, hypotension, syncope, reflex tachycardia, flushing, nausea/vomiting, diaphoresis, muscle twitching

Route: SL, Infusion (DRIP)

Adult dose: 0.4 mg SL, may repeat x3 q 5 minutes if Systolic BP>90 mmHg

0.5-1" transdermal paste applied to upper anterior chest
(wipe off if hypotension develops)

Nitroglycerin IV Drip → Initiate at 5 mcg/min IV/IO infusion
Increase 5 mcg/min every 5 minutes, titrate to desired effect
(max 200 mcg/min)

Pediatric dose: Initiate at 0.25-0.5 mcg/kg/min IV/IO; titrate by 1 mcg/kg/min q 15-20 minutes as tolerated (max dose 10 mcg/kg/min)
In adolescents, start with 5-10 mcg/min and titrate as tolerated (max 200 mcg/min)

P

Norepinephrine (Levophed)

Guideline: [Hypotension](#), [ROSC](#), [Sepsis](#)

Indications: Hypotension refractory to IV fluid boluses

Class: Alpha/beta adrenergic agonist

MOA: Stimulates alpha and beta adrenergic receptors thereby increasing systemic blood pressure, cardiac contractility, and heart rate. Alpha effects are greater than beta effects.

Contraindications: Hypersensitivity to norepinephrine or sulfites, HTN

SE: Bradycardia, peripheral ischemia, anxiety, headache, skin necrosis, dyspnea, respiratory difficulty

Route: Infusion via IV pump (DRIP)

Norepinephrine is supplied in 4mg/4ml vials. Mix 4mg norepinephrine in 500 ml Normal Saline. The concentration will now be 8 mcg/ml.

Adult dose:

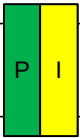
IV infusion via IV pump at 2mcg/min to 20 mcg/min titrating to effect.

Norepinephrine can be given via IO

Pediatric dose:

IV infusion via IV pump at 0.05 mcg/kg/min to max dose of 2.0 mcg/kg/min titrating to effect.

Norepinephrine can be given via IO



Ondansetron (Zofran)

Guideline: [Chest Pain](#), [Abdominal Pain](#), [Vomiting / Nausea](#)

Indications: For prevention and control of nausea and vomiting

Class: 5-HT3 receptor antagonist

MOA: Blocks action of Serotonin, which is a natural substance that causes N/V

Contraindications: Known allergy to this medicine or other 5-HT3 receptor antagonists

SE: Chest pain, wheezing, hives/skin rash, nausea, vomiting

Route: IV/IO/SL

Adult dose: 4-8 mg IV/IO/PO q 4 hrs PRN, MAX 32 mg/24 hrs
PO only with ODT Zofran tablets

Pediatric dose: 0.1 mg/kg IV/IO (1 mo-12 yo / <40 kg)

4 mg IV/IO (>12 yo / >40 kg)

P

Propofol (Diprivan)

Guideline: [Airway: RSI](#)

Indications: For rapid onset of sedation or maintenance of sedation during patient transfer

Class: General anesthetic

MOA: Potentiation of GABA_A receptor activity

Contraindications: Hypersensitivity

SE: Bradycardia, decreased cardiac output, hypotension

Route: IV/IO

For rapid increase in sedation:

Adult dose: 10-20 mg IV/IO

Onset of action: 30 seconds

Duration: 3-10 minutes

For maintenance of adequate sedation:

Adult dose: 5-50 mcg/kg/min IV/IO titrate dose until adequate sedation has been achieved

For rapid increase in sedation:

Pediatric dose: 2-5 mg/kg IV/IO

Onset of action: 30 seconds

Duration: 3-10 minutes (be aware of shorter time of action on peds patients)

For maintenance of adequate sedation:

Pediatric dose: 2-9 mg/kg/hr (note difference in drip rate)

******Pediatric patients have a higher metabolism and may require a faster increase in propofol per kg than adults******

P

Promethazine (Phenergan)

Guideline: [Vomiting / Nausea](#)

Indications: To prevent or control nausea and vomiting

Class: Antiemetic/Sedative

MOA: CNS acting antiemetic with some sedative properties. Member of the phenothiazine family. May cause extra-pyramidal symptoms (spasm of neck, jaw, back, or eye muscles) and it may cause anticholinergic symptoms (dry mouth, difficulty urinating, difficulty defecating)

Contraindications: Hypersensitivity, lactating females, MAOI use, COPD, HTN, pregnancy

SE: Extra-pyramidal symptoms, drowsiness, blurred vision, dry mouth, sedation

Route: IM

Adult dose: 12.5-25 mg slow IM q 15 minutes, Max= 50 mg

Pediatric: 0.5 mg/kg slow IM (>2 yo) **DO NOT exceed adult dose**

Contraindicated for patients <2 yo

P

Rocephin (Ceftriaxone)

Guideline: [Sepsis, Extremity Trauma, Multi-System Trauma, Animal Bites](#)

Indications: Suspected Pneumonia or allergy to penicillins with sepsis, QSOFA >1, contaminated wounds and/or open fractures with prolonged transport time

Class: Antibacterial agent

MOA: Exerts bacteriocidal activity by interfering with bacterial cell wall synthesis and inhibiting cross-linking of the peptidoglycan.

Contraindications: Hyperbilirubinemic neonates.

SE: Hives, pruritis, neutropenia, diarrhea, C. Diff infection

Route: IV/IO

Adult dose: 1g pre-mixed bag over 30 minutes

Pediatric dose:

50 mg/kg/day not to exceed 1g

P

Rocuronium (Zemuron)

Guideline: [Airway: RSI](#)

Indications: Paralysis to facilitate tracheal intubation, long-acting paralytic

Class: Non-depolarizing neuromuscular blocking agent

MOA: Non-depolarizing agent resulting in blockade at the neuromuscular junction by competing with acetylcholine for cholinergic receptors at the motor end plate.

Contraindications: Hypersensitivity

SE: Apnea, bronchospasm, dysrhythmias

Route: IV/IO

Adult dose: 0.5-1 mg/kg

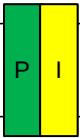
Onset: 30-60 seconds

Duration: 20-75 minutes

Pediatric dose: 0.5-1 mg/kg

Onset: 30-60 seconds

Duration: 20-75 minutes



Sodium Bicarbonate (NaHCO₃)

Guideline: [Cardiac arrest, Overdose / Toxic Ingestion, Hyperglycemia, Hyperkalemia](#)

Indications: Mild to moderate metabolic acidosis due to shock, severe dehydration, anoxia, metabolic acidosis, cardiac arrest secondary to suspected acidosis, and to treat overdose of Tricyclic antidepressants

Class: Alkalizing agent, electrolyte and antacid

MOA: Neutralizes hydrochloric acid. Systemic and urinary alkalinizer

Contraindications: Metabolic and respiratory alkalosis, hypertension, convulsions, CHF, and other situations where sodium can be dangerous, Calcium products given through the same IV

SE: Gastric distention, hypocalcemia, metabolic alkalosis, tissue sloughing at the site, hyperosmolarity, hypernatremia, hypokalemia, hypochloremia

Route: IV/IO

Adult dose: 1 mEq/kg 8.4% solution slow IV/IO bolus

Pediatric dose: 1 mEq/kg 4.2% solution slow IV/IO bolus

P

Succinylcholine (Anectine)

Guideline: [Airway: Drug Assisted Intubation](#)

Indications: Facilitate intubation, terminate laryngospasm, promote muscle relaxation, and facilitate electroconvulsive shock therapy

Class: Neuromuscular Blocker; Paralyzing Agent

MOA: Depolarizing agent resulting in blockade at the neuromuscular junction. Binds to the receptors for Acetylcholine resulting in paralysis of most muscles including respiratory musculature

Contraindications: Acute narrow-angle glaucoma, penetrating eye injuries, inability to control airway or support ventilations with oxygen and positive pressure, severe burns > 24 hours old, crush injuries, rhabdomyolosis, known hyperkalemia, known personal or family Hx of malignant hyperthermia, neuro-muscle diseases

SE: Apnea, malignant hyperthermia, arrhythmias, bradycardia, hypertension, hypotension, cardiac arrest, hyperkalemia, increased intraocular pressure, fasciculation, and exacerbation of hyperkalemia in trauma patients

Route: IV/IO

Adult dose: 1-1.5 mg/kg IV/IO
onset: 10-30 seconds

Pediatric dose: [>12 years OR longer than Broselow tape]
1.5 mg/kg rapid IV/IO

P

Thiamine (Betaxin)

Guideline: [Hypoglycemia](#)

Indications: Coma of unknown origin, Delirium Tremens, Beriberi, Wernicke's encephalopathy

Class: Vitamin B-1

MOA: Combines with ATP to form thiamine pyrophosphate coenzyme, a necessary component for carbohydrate metabolism. The brain is extremely sensitive to thiamine deficiency

Contraindications: None

SE: Hypotension from too rapid of an injection or too high a dose, anxiety, diaphoresis, nausea/vomiting, allergy (rare)

Route: IV/IO

Adult dose: 100 mg IV/IO

Pediatric dose: Not recommended

P

Tranexemic Acid (TXA)

Guideline: [Adult Multiple Trauma](#), [Pediatric Multiple Trauma](#)

Indications: Hemorrhagic shock less than 3 hours old with suspected need for massive transfusion (>10 units PRBCs) due to internal or external blood loss. Post-partum hemorrhage, epistaxis

*Criteria for administration:

- Paramedic discretion based on mechanism of injury or:
- Sustained heart rate of 110 beats per minute or greater
- Sustained systolic BP < 90 mmHg secondary to blood loss

Class: Antifibrinolytic

MOA: Competitively inhibits activation of plasminogen, reducing conversion of plasminogen to plasmin. At higher doses, directly inhibits plasmin activity

Contraindications: Active intravascular clotting (DVT, PE), acquired defective color vision, subarachnoid hemorrhage, hypersensitivity to TXA or its ingredients

SE: Impaired color vision, allergic rxns, thrombotic events, HoTN, nausea, vomiting, diarrhea

Route: IV/IO, Atomized

Adult Dose: Bolus → Mix 1 gram TXA in 100–150 mL NS, infuse over 10 minutes IV/IO

Maintenance → If transport time > 1 hour,

Mix 1 gram TXA in 1000 mL NS, infused at 125 mL/hr IV/IO

Nose bleed: Draw up TXA in 10ml syringe and atomize into hemorrhaging nare(S)

Pediatric Dose: Bolus → Mix 1 gram TXA in 100-150 mL NS, 20 mg/kg IV/IO over 10 minutes

DO NOT Exceed Adult Dose

Maintenance → If transport time > 1 hour,

Mix 1 gram TXA in 1000 mL NS, 20 mg/kg IV/IO infused over 8 hours

DO NOT Exceed 1 gram over 8 hours

P

Vecuronium (Norcuron)

Guideline: [Airway: RSI](#)

Indications: Paralysis to facilitate tracheal intubation, long-acting paralytic

Class: Non-depolarizing neuromuscular blocking agent

MOA: Non-depolarizing agent resulting in blockade at the neuromuscular junction by competing with acetylcholine for cholinergic receptors at the motor end plate.

Contraindications: Hypersensitivity

SE: Apnea, bronchospasm, dysrhythmias

Route: IV/IO

Adult dose: 0.1 mg/kg

Onset: 2-3 minutes

Duration: 30-40 minutes

Pediatric dose: 0.1 mg/kg

Onset: 2-3 minutes

Duration: 30-40 minutes

P

Zosyn (Piperacillin/Tazobactam)

Guideline: [Sepsis, Bites and Envenomation, Extremity Trauma, Adult Mult-System Trauma](#)

Indications: Infection of unknown origin and QSOFA >1, contaminated wound/injury and/or open fracture with prolonged transport time, intra-abdominal infections

Class: Antibacterial drug

MOA: Exerts bactericidal activity by inhibiting septum formation and cell wall synthesis of susceptible bacteria.

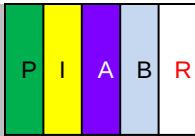
Contraindications: History of allergy to penicillins, cephalosporins, or B-lactamase inhibitors.

SE: Headache, diarrhea, skin rash, constipation

Route: IV/IO

Adult dose: 4.5g added into a 100mL NS over 30

minutes Pediatric dose: Medical control



Standards Procedure (Skill)

Active and Passive Warming

Clinical Indications:

- Hypothermia or risk of hypothermia due to environmental exposure, wet clothing, or immersion.
- Perioperative patients experiencing unintended hypothermia.

Clinical Contraindications

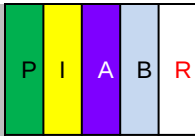
- Patients with thermal burn injuries.
- Circumstances where warming could exacerbate medical conditions, such as frostbite.

Procedure:

1. **Assessment:** If possible determine the patient's core temperature and clinical signs of hypothermia (shivering, cold skin, lethargy).
2. **Remove Wet Clothing:** Cut or remove wet clothing to stop further heat loss.
3. **Dry and Insulate:** Dry the patient thoroughly. Wrap in blankets, including thermal or space blankets if available. Consider use of the Ready-Heat Blanket (*With a insulated layer between patient and blanket, to prevent possible burns).
4. **Active Warming (if indicated):** Apply warmed forced-air blankets or use warmed IV fluids for severe hypothermia. Monitor the patient's temperature closely.
5. **Monitor:** Regularly monitor vital signs, core temperature, and signs of rewarming shock (a rare but dangerous reaction to rapid rewarming).
6. **Supportive Care:** Provide warm, sweetened liquids if the patient is conscious and able to swallow to aid in internal warming.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill) Assessment: Adult

Clinical Indications:

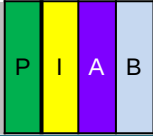
- Any patient requesting a medical evaluation that is too large to be measured with a Broselow-Luten Resuscitation Tape.

Procedure:

- Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, bystander safety, and patient/caregiver interaction.
- Assess the need for additional resources.
- Initial assessment includes a general impression as well as the status of a patient's airway, breathing, and circulation.
- Assess mental status (e.g., AVPU) and disability (e.g., GCS).
- Control major hemorrhage and assess overall priority of patient.
- Perform a focused history and physical exam based on patient's chief complaint.
- Assess the need for critical interventions.
- Complete critical interventions and perform a complete secondary exam to include a baseline set of vital signs as directed by protocol.
- Maintain an on-going assessment throughout transport; to include patient response/possible complications of interventions, need for additional interventions, and assessment of evolving patient complaints/conditions.
- Document all findings and information associated with the assessment, performed procedures, and any administration of medications on the PCR.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

12 Lead EKG

Clinical Indications:

- Suspected cardiac patient.
- Respiratory distress.
- Suspected tricyclic overdose.
- Electrical injuries.
- Syncope.

Procedure:

1. Assess the patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants.
3. If the patient is unstable, definitive treatment is the priority. If the patient is stable or stabilized after treatment, perform a 12 Lead EKG.
4. Prepare EKG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the 12 lead EKG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
 - RA -Right arm
 - LA -Left arm
 - RL -Right leg
 - LL -Left leg
 - V1 -4th intercostal space at right sternal border
 - V2 -4th intercostal space at left sternal border
 - V3 -Directly between V2 and V4
 - V4 -5th intercostal space at midclavicular line
 - V5 -Level with V4 at left anterior axillary line
 - V6 -Level with V5 at left midaxillary line
8. Instruct patient to remain still.
9. Press the appropriate button to acquire the 12 Lead EKG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the 12 Lead acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the EKG data to the appropriate hospital.
12. Contact the receiving hospital to notify them that a 12 Lead EKG has been sent.
13. Monitor the patient while continuing with the treatment protocol.
14. Download data as per guidelines and attach a copy of the 12 Lead to the PCR.
15. Document the procedure, time, and results on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)**Airway: Endotracheal Tube Introducer (Bougie)****Clinical Indications:**

- Patients meet clinical indications for oral intubation.

Contraindications:

- None

Procedure:

1. Prepare, position and oxygenate the patient with 100% oxygen.
2. Select proper ET tube without stylet, test cuff and prepare suction. (Use Pediatric bougies for ET Tube sizes for size 4-6mm)
3. Lubricate the distal end and cuff of the endotracheal tube (ETT) and the distal 1/2 of the Endotracheal Tube Introducer (Bougie) (note: failure to lubricate the Bougie and the ETT may result in being unable to pass the ETT).
4. Using laryngoscopic techniques, visualize the vocal cords if possible using Sellick's/BURP as needed.
5. Introduce the Bougie with curved tip positioned anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized. Use the tip of the bougie, moving over the tracheal rings to confirm the bougie is in.
6. Withdraw the Bougie ONLY to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie.
7. While maintaining a firm grasp on the proximal Bougie, introduce the ET tube over the Bougie passing the tube to its appropriate depth.
8. If you are unsure of the placement, use the video-laryngoscope to confirm and visualize placement.
9. Once the ETT is correctly placed, hold the ET tube securely and remove the Bougie;
10. Inflate the cuff with 3 to 10 mL of air, auscultate for equal breath sounds and reposition accordingly.
11. When final position is determined secure the ET tube, reassess breath sounds, apply end- tidal CO₂ monitor, and record and monitor readings to assure continued tracheal intubation.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Airway: CPAP (Stand Alone CPAP Device)

Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use:

- CPAP is indicated in all patients whom inadequate ventilation is suspected (at least 2 of the following):
 - Rales (crackles).
 - Dyspnea with hypoxia ($\text{SpO}_2 < 90\%$ despite O_2 administration).
 - Accessory muscle use.
 - Respiratory rate $> 24/\text{minute}$, despite O_2 administration.
 - Diminished tidal volume.
 - Inadequate ventilation may be associated with: asthma, pulmonary edema, altitude injury/HAPE, pneumonia, COPD-chronic bronchitis/emphysema, CHF, drowning/near-drowning, toxic inhalation injury or CO poisoning.

Clinical Contraindications:

- Lack of airway protective reflexes.
- Decreased level of consciousness and/or inability to follow commands.
- Respiratory failure requiring immediate intubation.
- Respiratory or cardiac arrest.
- Cardiogenic shock.
- Suspected pneumothorax.
- Systolic BP < 90 mmHg despite attempts to correct.
- Vomiting/active upper GI bleed, or recent gastro-esophageal surgery.
- Recent facial/ENT surgery, significant facial deformities, or significant facial trauma.
- Patient size or anatomy prevents adequate mask seal.

Procedure:

1. Ensure adequate oxygen administration (begin with 2 lpm) to the CPAP device. Power the device on.
 2. Place the patient in a seated position and explain/coach the procedure to the patient.
 3. Assess vital signs (BP, HR, RR, SpO_2 , and EtCO_2).
 4. Start with a continuous pressure setting of 3 cmH_2O .
 5. Place the CPAP delivery mask over the patient's mouth and nose.
 6. Gently secure the mask with the provided straps, starting with the lower straps, until minimal air leak is achieved.
 7. Gradually titrate the continuous pressure to achieve the most stable respiratory status for the patient.
DO NOT exceed 15 cmH_2O of continuous pressure.
 8. Titrate oxygen administration to the patient's response.
 9. Reassess vital signs every 5 minutes and evaluate for patient improvement as evidenced by:
 - Reduced dyspnea.
 - Reduced verbal impairment.
 - Increased SpO_2 .
 - Stabilized blood pressure.
 - Appropriate EtCO_2 values and waveforms.
 - Increased tidal volume.
 10. Observe closely for signs of deterioration and/or failure of response to CPAP:
 - Decrease in level of consciousness **[Discontinue CPAP]**.
 - Sustained or increased heart rate, respiratory rate or increased blood pressure.
 - Rising EtCO_2 levels or other EtCO_2 evidence of ventilatory failure **[Discontinue CPAP]**.
 - Diminished or no improvement in tidal volume.
 - Evidence of pneumothorax **[Discontinue CPAP]**.
- *Should the patient deteriorate on CPAP, consider endotracheal intubation.***
10. Document time and response on patient care report (PCR).
- *In-line nebulized medications may be given during CPAP in accordance with appropriate guidelines.***

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure.
- Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Airway: BiPAP (Zoll Ventilator)

Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use:

CPAP is indicated in all patients whom inadequate ventilation is suspected (at least 2 of the following):

- Rales (crackles).
 - Dyspnea with hypoxia ($\text{SpO}_2 < 90\%$ despite O_2 administration).
 - Accessory muscle use.
 - Respiratory rate $> 24/\text{minute}$, despite O_2 administration.
 - Diminished tidal volume.
- Inadequate ventilation may be associated with: asthma, pulmonary edema, altitude injury/HAPE, pneumonia, COPD-chronic bronchitis/emphysema, CHF, drowning/near-drowning, toxic inhalation injury or CO poisoning.

Clinical Contraindications:

- Lack of airway protective reflexes.
- Decreased level of consciousness and/or inability to follow commands.
- Respiratory failure requiring immediate intubation.
- Respiratory or cardiac arrest.
- Cardiogenic shock.
- Suspected pneumothorax.
- Systolic BP < 90 mmHg.
- Vomiting/active upper GI bleed, or recent gastro-esophageal surgery.
- Recent facial/ENT surgery, significant facial deformities, or significant facial trauma.
- Patient size or anatomy prevents adequate mask seal.

Procedure:

1. Power on ventilator, select BiPAP Mode
 2. Place the patient in a seated position and explain/coach the procedure to the patient.
 3. Assess vital signs (BP, HR, RR, SpO_2 , and EtCO_2).
 4. Place the delivery mask over the patient's mouth and nose.
 5. Gently secure the mask with the provided straps, starting with the lower straps, until minimal air leak is achieved.
 6. Gradually titrate the continuous pressure to achieve the most stable respiratory status for the patient.
 7. IPAP: Start 10-15 cm H₂O, Titration IPAP in 2-5 cm increments at a rate of 5 cm H₂O every 10 min for a Max 20-25 cm H₂O
IPAP > 20 cm H₂O risks gastric distention, aspiration risk and diaphragmatic excursion
 8. EPAP: Start at 4-5 cm H₂O, Max 10-15 cm H₂O
EPAP can also be increased to a max of 6 cm H₂O in 1 cm H₂O increments to improve oxygenation. If EPAP is increased, IPAP should be simultaneously increased by 2 cm H₂O.
 9. Adjust the FiO_2 : 1.0 (100%) titrated down if sats $> 91\%$
Tidal volume increased as difference between IPAP and EPAP increases
 10. Adjust the Inspiratory to expiratory time (I:E) 1:2
(For COPD patients, Set I:E low (1:3-1:4) for a shorter inspiratory time, allowing for adequate ventilation)
 11. Reassess vital signs every 5 minutes and evaluate for patient improvement.
 12. Observe closely for signs of deterioration of respiratory status and level of consciousness. ***Should the patient deteriorate on BiPAP, consider endotracheal intubation.***
 10. Document time and response on patient care report (PCR).
- *In-line nebulized medications may be given during BiPAP in accordance with appropriate guidelines.*

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Airway: CPAP (Hamilton Ventilator)

Clinical Indications for Continuous Positive Airway Pressure (CPAP) Use:

- CPAP is indicated in all patients whom inadequate ventilation is suspected (at least 2 of the following):
 - Rales (crackles).
 - Dyspnea with hypoxia ($\text{SpO}_2 < 90\%$ despite O_2 administration).
 - Accessory muscle use.
 - Respiratory rate $> 24/\text{minute}$, despite O_2 administration.
 - Diminished tidal volume.
 - Inadequate ventilation may be associated with: asthma, pulmonary edema, altitude injury/HAPE, pneumonia, COPD-chronic bronchitis/emphysema, CHF, drowning/near-drowning, toxic inhalation injury or CO poisoning.

Clinical Contraindications:

- Lack of airway protective reflexes.
- Decreased level of consciousness and/or inability to follow commands.
- Respiratory failure requiring immediate intubation.
- Respiratory or cardiac arrest.
- Cardiogenic shock.
- Suspected pneumothorax.
- Systolic BP < 90 mmHg.
- Vomiting/active upper GI bleed, or recent gastro-esophageal surgery.
- Recent facial/ENT surgery, significant facial deformities, or significant facial trauma.
- Patient size or anatomy prevents adequate mask seal.

Procedure:

1. Select the appropriately sized mask and ensure mask is non-vented. Secure mask with straps.
2. Place in **NIV-ST** mode and set IPAP to 0 and EPAP to desired CPAP level. Initiate at a minimum of 5cmH₂O. Use caution when exceeding EPAP/PEEP over 15mmHg, consider contacting medical control.
3. Titrate FIO₂ as necessary
4. Check for air leaks.
5. Monitor and document patient's response to treatment.
6. Monitor for skin breakdown from mask during transport.
7. Continue to coach the patient to keep mask in place and readjust as needed.
8. Consider sedation if patient is unable to tolerate the procedure.
9. If respiratory status deteriorates, remove device and consider BVM ventilation and/or Rapid Sequence Induction.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

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Standards Procedure (Skill)

Airway: BiPAP (Hamilton Ventilator)

Clinical Indications for Continuous Positive Airway Pressure (BiPAP) Use:

- BiPAP is indicated in all patients whom inadequate ventilation is suspected (at least 2 of the following):
 - Rales (crackles).
 - Dyspnea with hypoxia ($\text{SpO}_2 < 90\%$ despite O_2 administration).
 - Accessory muscle use.
 - Respiratory rate $> 24/\text{minute}$, despite O_2 administration.
 - Diminished tidal volume.
 - Inadequate ventilation may be associated with: asthma, pulmonary edema, altitude injury/HAPE, pneumonia, COPD-chronic bronchitis/emphysema, CHF, drowning/near-drowning, toxic inhalation injury or CO poisoning.

Clinical Contraindications:

- Lack of airway protective reflexes.
- Decreased level of consciousness and/or inability to follow commands.
- Respiratory failure requiring immediate intubation.
- Respiratory or cardiac arrest.
- Cardiogenic shock.
- Suspected pneumothorax.
- Systolic BP < 90 mmHg.
- Vomiting/active upper GI bleed, or recent gastro-esophageal surgery.
- Recent facial/ENT surgery, significant facial deformities, or significant facial trauma.
- Patient size or anatomy prevents adequate mask seal.

Procedure:

1. Select the appropriately sized mask and ensure mask is non-vented. Secure mask with straps.
2. Place in **NIV-ST** mode and set P_{insp} (inspiratory pressure) to desired value. P_{insp} setting is needed in addition to the PEEP/CPAP (expiratory pressure) level for BiPAP.
3. Initiate at 10-P_{insp} and 5-PEEP and titrate pressures as necessary
4. Ensure a 4-5cmH₂O difference in P_{insp} and PEEP/CPAP to maintain ventilation. P_{insp} is greater than PEEP/CPAP.
5. May Adjust rise time for patient comfort:
 - Rise time (TI) > 4 = slower breath delivery (adjusts the I:E)
 - Rise time (TI) < 4 = quicker breath delivery (adjusts the I:E)
6. Titrate FIO₂ as necessary
7. Check for air leaks. To change the percentage of air leak compensation, go to Controls>More>%EST>Set it slightly greater than your current leak level.
8. To adjust your "back up respiratory rate" (for apnea periods) Go Controls>Basic>Rate
9. Monitor and document patient's response to treatment.
10. Monitor for skin breakdown from mask during transport.
11. Continue to coach the patient to keep mask in place and readjust as needed.
12. Consider adjusting the "Flow Trigger". Controls > Flow trigger > higher flow trigger = lower sensitivity per breath
13. Consider sedation if patient is unable to tolerate the procedure.
14. If respiratory status deteriorates, remove device and consider BVM ventilation and/or Rapid Sequence Induction.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

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Standards Procedure (Skill)

Airway: Hamilton Ventilator Operation**Clinical Indications:**

Management of the ventilation of a patient during a prolonged or interfacility transport of an intubated patient.

Procedure:

1. Perform circuit leak test on all circuits prior to patient use.
 2. Obtain birth sex and accurate height of the patient.
 3. Document ET tube size and depth of placement.
 4. Record initial arterial or venous blood gas from sending facility.
 5. Provider should choose mode to best suit patient's ventilation needs.
 6. When no single mode is indicated, use **Adaptive Support Ventilation (ASV)** mode for most patients.
 - a. ASV mode contraindicated for known air leak condition:
 - i. ET tube leak
 - ii. Tracheal disruption
 - iii. Bronchial disruption
 - iv. Broncho pleural fistula
 - b. ASV mode contraindicated in status asthmaticus and severe COPD patients (severe obstructive disease).
 - c. ASV mode relatively contraindicated in severe Diabetic Ketoacidosis patients and other patients with irregular respiratory drive.
 7. Enter appropriate birth sex and height of patient and Hamilton Ventilator will automatically determine idea body weight (IBW) of the patient.
 8. Under Modes tab select ASV mode and confirm.
 - a. Under controls select % minute ventilation.
 - i. For most patients select 100% minute ventilation (100 ml/kg/min).
 - ii. For known ARDS patients, recommend starting at 125% minute ventilation.
 - iii. For fever/sepsis patients, recommend starting at 110% minute ventilation.
 - b. Set PEEP level:
 - i. Start at 5 cm H₂O, adjust appropriately
 - c. Set Maximum Pulmonary Pressure at 40 cm H₂O (most patients), default setting.
 - i. Ventilator will alarm at 10 cm H₂O below alarm setting (30 cmH₂O for default setting).
 - d. Set initial FiO₂ setting to 100%, adjust appropriately to oxygen saturation of 92-94%.
 9. Hamilton Ventilator with severe respiratory obstruction disease patient (severe COPD, status asthmaticus, severely obese).
 - a. General Principles:
 - i. Will allow for mild-moderate permissive hypercapnia with these patients (i.e.. EtCO₂ >45 mm Hg).
 - ii. Start with lower calculated Tidal Volume of 6-8 ml/kg.
 - iii. Start with lower respiratory rate to allow for full expiration during ventilation and avoid breath stacking.
- Start 12-18 breaths/min.
- iv. Increase maximum respiratory pressure alarm to 50 cmH₂O (alarm will start at 40 cmH₂O)
 - v. Ensure full exhalation, watch flow vs time waveform closely to avoid auto-peep.
 - vi. After you have achieved appropriate Tidal Volumes (6-8 ml/kg) then start fine tuning to get EtCO₂ as close to normal as possible (35-45 mgHg).
10. Consider increasing Ti (inspiratory time) which will increase Tidal Volume with lower pressure and will allow you to slowly increase respiratory rate to lower EtCO₂.
 - vii. Continue Medical Treatment (albuterol, DuoNeb, steroids, magnesium, epinephrine).
- b. Select appropriate birth sex and accurate height for ventilator to select IBW.

Standards Procedure (Skill)

Airway: Hamilton Ventilator Operation**Clinical Indications:**

Management of the ventilation of a patient during a prolonged or interfacility transport of an intubated patient.

Procedure:

Ventilation - Hamilton: Adult & Pediatric

- c. Select **(S)CMV** mode and confirm.
- d. Under controls set:
 - i. Tidal Volume at 6-8 ml/kg, recommend starting at 6 ml/kg.
 - ii. Respiratory rate to 12-18 bpm, recommend starting at 12 bpm.
 - iii. I:E ratio, leave at 1:4.0 (default level) to start.
 - iv. Consider adjusting flow trigger to 3 liters/minute.
 - v. FIO₂ at 100% to start, then titrate down appropriately.
 - vi. Confirm settings. Start Ventilating.
- e. Monitor patient parameters with goal of achieving tidal volume of 8 ml/kg. Make only one change at a time and allow 3-4 breaths before making further changes.
 - i. Decrease respiratory rate by 1-2 bpm to work toward tidal volume while still maintaining peak respiratory pressure less than 40 cmH₂O if possible.
 - ii. With a severely obstructed patient, may need to further increase maximum respiratory pressure alarm.
 - iii. Once tidal volume is achieved, then make sure patient is achieving full exhalation by looking at flow vs. time waveform to make sure exhalation line is coming all the way back to baseline.
 - iv. Start fine-tuning controls by increasing the Ti (inspiratory time) by decreasing I:E ratio (decrease from 1:4.0 to 1:3.0) which will allow for longer inspiration and lower maximum respiratory pressures, as long as patient continues to have full expiration.
 - v. As peak pressures improve (decrease), gradually increase respiratory rate by 1-2 bpm.
 - vi. Continue to adjust I:E ratio and respiratory rate with goal of maintaining calculated tidal volume (or reasonably close) and ensuring complete exhalation.
 - vii. Monitor plateau pressure with goal of <30 cmH₂O. Monitoring tab, #3.
- f. Transportation of Intubated/Ventilated Patients
 - i. Consider placing a C-Collar or KED on patient to stabilize head and neck and decrease chance of accidental extubation.
 - ii. Elevate HOB of all intubated patients approximately 30 degrees, unless contraindicated.
- g. Metabolic Acidosis (DKA, lactic acidosis, salicylate overdose): These patients require high minute volumes to maintain adequate pH. High respiratory rates are common (>25). Ensure adequate expiratory time with higher RR, consider decreasing I-time. Utilize Winter's Formula for goal PaCO₂

Standards Procedure (Skill)

Airway: General Ventilator Management**Clinical Indications:**

- Management of the ventilation of a patient during a prolonged or interfacility transport of an intubated patient.

Procedure:

1. Transporting personnel should review the operation of the ventilator with the treating personnel (physician, nurse, or respiratory therapy) in the referring facility prior to transport if possible.
2. All ventilator settings, including respiratory rate, FiO₂, mode of ventilation, and tidal volumes should be recorded prior to initiating transport. Additionally, the recent trends in oxygen saturation experienced by the patient should be noted.
3. Prior to transport, specific orders regarding any anticipated changes to ventilator settings as well as causes for significant alarm should be reviewed with the referring medical personnel as well as medical control.
4. Once in the transporting unit, confirm adequate oxygen delivery to the ventilator.
5. Frequently assess breath sounds to assess for possible tube dislodgement during transfer. (D.O.P.E)
6. Frequently assess the patient's respiratory status, noting any decreases in oxygen saturation or changes in tidal volumes, peak pressures, etc.
7. Note any changes in ventilator settings or patient condition in the PCR.
8. Consider placing an NG or OG tube to clear stomach contents.
- 9. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**
10. If any significant change in patient condition, including vital signs or oxygen saturation or there is a concern regarding ventilator performance/alarms, remove the ventilator from the endotracheal tube and use a bag-valve mask with 100% O₂. Contact medical control immediately.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Airway: Ventilator Management (ARDSnet Procedure)**Clinical Indications:**

For management of ARDS patients who have been placed on a ventilator



NIH NHLBI ARDS Clinical Network
Mechanical Ventilation Protocol Summary

Procedure:

ARDS patients:

- I. Manage according to ARDSnet Protocol with initial VT of 8ml/kg and decrease PRN to keep plateau pressure ≤ 30 cmH₂O. May decrease VT to 4 – 6ml/kg
- II. Higher PEEP levels (up to 20 cmH₂O) are common.
- III. Plateau pressure should be measure at initial setup and PRN after vent setting changes or if clinical conditions warrant.

INCLUSION CRITERIA: Acute onset of

1. $\text{PaO}_2/\text{FiO}_2 \leq 300$ (corrected for altitude)
2. Bilateral (patchy, diffuse, or homogeneous) infiltrates consistent with pulmonary edema
3. No clinical evidence of left atrial hypertension

VENTILATOR SETUP AND ADJUSTMENT

1. Calculate predicted body weight
2. Select any ventilator mode
3. Set ventilator settings to achieve initial VT = 8 ml/kg PBW
4. Reduce VT by 1 ml/kg at intervals ≤ 2 hours until VT = 6ml/kg PBW.
5. Set initial rate to approximate baseline minute ventilation (not > 35 bpm).
6. Adjust VT and RR to achieve pH and plateau pressure goals below.

OXYGENATION GOAL:

- PaO_2 55-80 mmHg or SpO_2 88-95% Use a minimum PEEP of 5 cm H₂O. Consider use of incremental FiO_2 /PEEP combinations.

PLATEAU PRESSURE GOAL: ≤ 30 cm H₂O

- Check Pplat (0.5 second inspiratory pause), at least q 4h and after each change in PEEP or VT. If Pplat > 30 cm H₂O: decrease VT by 1ml/kg steps (minimum = 4 ml/kg).
- If Pplat < 25 cm H₂O and VT < 6 ml/kg, increase VT by 1 ml/kg until Pplat > 25 cm H₂O or VT = 6 ml/kg.
- If Pplat < 30 and breath stacking or dys-synchrony occurs: may increase VT in 1ml/kg increments to 7 or 8 ml/kg if Pplat remains < 30 cm H₂O.

pH GOAL: 7.30-7.45

Acidosis Management: (pH < 7.30)

- If pH 7.15-7.30: Increase RR until pH > 7.30 or $\text{PaCO}_2 < 25$ (Maximum set RR = 35).
- If pH < 7.15 : Increase RR to 35. If pH remains < 7.15 , VT may be increased in 1 ml/kg steps until pH > 7.15 (Pplat target of 30 may be exceeded). May give NaHCO₃

Alkalosis Management: (pH > 7.45) Decrease vent rate if possible.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Airway: Needle Cricothyrotomy (Rusch QuickTrach or Commercial Equivalent)

Clinical Indications:

- Partial-Complete upper airway obstruction (BLS maneuvers and/or direct laryngoscopy for FB removal with Magill forceps will be attempted first, when appropriate).
- Active airway management is indicated, but there is inability to obtain/secure airway by less invasive means.
- QuickTrach Sizing
- Under the age of 12

Use 4.0 mm QuickTrach for patients older than 5 years of age.

Use 2.0 mm QuickTrach for patients 1-5 years of age.

Clinical Contraindications:

- Neck swelling that obscures landmarks.
- Not a prophylactic measure. Patient must need airway/ventilation.

Procedure: (Rusch QuickTrach)

1. Open the package, remove the device, and familiarize yourself with its contents.
2. Place the patient in a supine position. Assure stable positioning of the neck region in a neutral position. Secure the larynx laterally between the thumb and forefinger. Locate the puncture site at the cricothyroid membrane (midline between the thyroid and cricoid cartilages).
3. Firmly hold the device and puncture the cricothyroid membrane at a 90 degree angle. The opening of the trachea is achieved by dilating through the skin. This reduces the risk of bleeding as only the smallest necessary opening is made.
4. After puncturing the cricothyroid membrane, check the entry of the needle into the trachea by aspirating air through the syringe. If air is present, the needle is within the trachea. Should no aspiration of air be possible because of an extremely thick neck, it is possible to remove the stopper and carefully insert the needle further until entrance into the trachea is made. Now, change the angle to 60 degrees and advance the device forward into the trachea to the level of the stopper. The stopper reduces the risk of inserting the needle too deeply and causing damage to the posterior wall of the trachea.
5. Remove the stopper. After the stopper is removed, be careful not to advance the device further with the needle still attached.
6. Hold the needle and the syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe. Secure the cannula using the neck tape, apply the connecting tube to the 15 mm connection and connect the other end to the BVM.
7. Confirm placement by auscultating lung sounds bilaterally in all fields, confirming absence of epigastric sounds, use of a EtCO₂ device, and/or use of waveform capnography.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Airway: Surgical Cricothyrotomy

Clinical Indications:

- Partial-Complete upper airway obstruction (BLS maneuvers and/or direct laryngoscopy for FB removal with Magill forceps will be attempted first, when appropriate).
- Active airway management is indicated, but there is inability to obtain/secure airway by less invasive means.
- Over the age of 12

Clinical Contraindications:

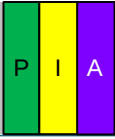
- Neck swelling that obscures landmarks.
- Not a prophylactic measure. Patient must need airway/ventilation.

Procedure:

1. Have suction and prepackaged surgical airway kit ready. The provider performing the procedure should wear PPE to prevent exposure from blood.
2. Install Bougie Introducer into cuffed ET tube sized between 5.5 cm to 6.5 cm. Test ETT cuff.
3. Locate the cricothyroid membrane utilizing anatomical landmarks.
4. Prepare the area with antiseptic swab. Have assistant available.
5. Make a 2 centimeter vertical incision through the skin and subcutaneous tissue above the and below the cricothyroid membrane with scalpel. Using thumb and index finger spread open incision to expose membrane.
6. Once cricothyroid membrane can be seen, puncture through membrane with scalpel. Widen incision 1 cm. With scalpel in trachea, carefully insert J-hook into opening in trachea with handle directed to sternal notch. Remove scalpel.
7. Without removing J-hook, insert Bougie Introducer with distal end directed down towards corina and slide the ETT into surgical opening far enough for the ETT cuff to pass just beyond surgical opening and fully into trachea, **no further**.
8. Using a 10 ml syringe, inflate the ETT cuff with 5 to 10 ml air. Continue holding tube in-place until a commercial securing device is placed.
9. Ventilate patient with BVM. Perform all standard assessment techniques to ensure correct tube placement. This includes; waveform capnography chest rise and fall, positive bilateral lung sounds, negative epigastric sounds, EtCO₂ metrics, and/or condensation on ETT.
10. Secure device using commercial ETT securing device.
11. Document ETT size, time, result (success), and placement depth by the cm marks at opening of the the patients neck. Capture waveform on monitor for record in PCR.
12. Place orogastric tube to clear stomach contents.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Capnography

Clinical Indications:

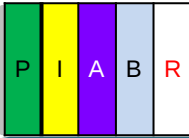
- Capnography shall be used when available with the use of all invasive airway procedures including endotracheal, nasotracheal, cricothyrotomy, or Blind Insertion Airway Devices (BIADs).
- Capnography should also be used when possible with CPAP.

Procedure:

1. Attach capnography sensor to the BIAD, endotracheal tube, or oxygen delivery device.
2. Note CO₂ level (Normal: 35-45mmHg) and waveform changes. These will be documented on each respiratory failure, cardiac arrest, or respiratory distress patient.
3. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
4. Any loss of CO₂ detection or waveform indicates an airway problem and should be documented.
5. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
6. Document the procedure and results on/with the Patient Care Report (PCR) and the Airway Evaluation Form.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Airway: Foreign Body Obstruction (FBO)

Clinical Indications:

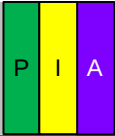
- Sudden onset of respiratory distress often with coughing, wheezing, gagging, or stridor due to a foreign-body obstruction of the upper airway.

Procedure:

1. Assess the degree of foreign body obstruction.
 - Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
 - In severe foreign-body obstructions, the patient may not be able to make a sound. The victim may clutch his/her neck in the universal choking sign.
2. **For an infant**, deliver 5 back blows (slaps) followed by 5 chest thrusts repeatedly until the object is expelled or the victim becomes unresponsive.
3. **For a child**, perform a subdiaphragmatic abdominal thrust (Heimlich Maneuver) until the object is expelled or the victim becomes unresponsive.
4. **For adults**, a combination of maneuvers may be required.
 - First, subdiaphragmatic abdominal thrusts (Heimlich Maneuver) should be used in rapid sequence until the obstruction is relieved.
 - If abdominal thrusts are ineffective, chest thrusts should be used. Chest thrusts should be used primarily in morbidly obese patients and in the patients who are in the late stages of pregnancy.
5. If the victim becomes unresponsive, begin CPR immediately but look in the mouth before administering any ventilations. If a foreign-body is visible, remove it.
6. **Do not perform blind finger sweeps in the mouth and posterior pharynx. This may push the object farther into the airway.**
7. In unresponsive patients, **EMT-Paramedic** level professionals should visualize the posterior pharynx with a laryngoscope to potentially identify and remove the foreign-body using Magill forceps.
8. Document the methods used and result of these procedures in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Airway: BIAD (iGel)

Clinical Indications:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex where at least one failed intubation attempt has occurred.
- Patient must be unconscious.

Procedure:

1. Pre-oxygenate the patient.
2. Select the appropriate tube size for the patient, based on weight (kg).
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the with the opening facing the tongue until resistance is met. **Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.**
6. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
7. **Confirm tube placement using end-tidal CO₂ detector.**
8. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

i-gel®
Training & Guidance





Standards Procedure (Skill)

Airway: BIAD (King)

Clinical Indications:

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- Appropriate intubation is impossible due to patient access or difficult airway anatomy.
- Inability to secure an endotracheal tube in a patient who does not have a gag reflex, and where at least one failed intubation attempt has occurred; or if laryngoscopy/intubation is outside of the provider's scope of practice (AEMT)
- Patient must be unconscious.

Procedure:

1. Pre-oxygenate the patient.
2. Select the appropriate tube size for the patient, based on height (feet)
3. Lubricate the tube.
4. Grasp the patient's tongue and jaw with your gloved hand and pull forward.
5. Gently insert the tube rotated laterally 45-90 degrees so that the blue orientation line is touching the corner of the mouth. Once the tip is at the base of the tongue, rotate the tube back to midline. Insert the airway until the base of the connector is in line with the teeth and gums.
6. Inflate the pilot balloon with 45-90 mL of air depending on the size of the device used.
- 7. Ventilate the patient while gently withdrawing the airway until the patient is easily ventilated.**
8. Auscultate for breath sounds and sounds over the epigastrium and look for the chest to rise and fall.
9. The large pharyngeal balloon secures the device.
- 10. Confirm tube placement using end-tidal CO₂ detector.**
- 11. It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Standards Procedure (Skill)

Airway: Intubation Nasotracheal (NTI)

Clinical Indications:

- A spontaneously breathing patient in need of intubation (inadequate respiratory effort, evidence of hypoxia or carbon dioxide retention, or need for airway protection).
- Rigidity or clenched teeth prohibiting other airway procedures.
- Patient must be 12 years of age or older.

Procedure:

1. Pre-medicate the patient with nasal spray.
2. Select the largest and least obstructed nostril. Insert a nasal airway lubricated with lidocaine jelly to help dilate and anesthetize the nasal passage.
3. Pre-oxygenate the patient. Lubricate the ETT with lidocaine jelly.
4. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
5. Continue to pass the tube listening for air movement and looking for to and fro vapor condensation in the tube. As the tube approaches the larynx air movement gets louder.
6. Gently and evenly advance the tube through the glottic opening on the inspiration. This facilitates passage of the tube and reduces the incidence of trauma to the vocal cords.
7. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.
8. Auscultate for bilaterally equal breath sounds and absence of sounds of the epigastrium. Observe for symmetrical chest expansion. The 15 mm adapter usually rests close to the nostril with proper positioning.
9. Inflate the cuff with 5-10 mL of air.
10. **Confirm tube placement using an end-tidal CO₂ monitoring.**
11. Secure the tube.
12. Reassess airway and breath sounds after transfer to the stretcher and during transport. These tubes are easily dislodged and require close monitoring and frequent reassessment.
13. Document the procedure, time, and result (success) on/with the patient care report (PCR).
14. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

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Standards Procedure (Skill)

Airway: Intubation Orotracheal (OTI)**Clinical Indications:**

- Inability to adequately ventilate a patient with a Bag Valve Mask or longer EMS transport distances require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.
- A component of Drug Assisted Intubation/RSI.

Procedure:

1. Prepare, position and oxygenate the patient with 100% Oxygen.
2. Select proper ET tube (and stylette, if used), have suction ready.
3. Using Video/Direct laryngoscope, visualize vocal cords. (Use Sellick maneuver/BURP to assist you).
4. Limit each intubation attempt to 30 seconds with BVM between attempts.
5. Visualize tube passing through vocal cords.
6. **Confirm and document tube placement using an end-tidal CO₂ monitoring.**
7. Inflate the cuff with 3-10 mL of air; secure the tube to the patient's face.
8. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium. If you are unsure of placement, remove tube and ventilate patient with BVM.
9. Consider using a Blind Insertion Airway Device/Bougie if intubation efforts are unsuccessful.
10. Apply end-tidal carbon dioxide monitor (Capnography) and record readings on scene, en route to the hospital, and at the hospital.
11. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR). Document all devices used to confirm initial tube placement. Also document presence or absence breath sounds before and after each movement of the patient.
12. Consider placing an NG or OG tube to clear stomach contents after the airway is secured with an ET tube.
13. **It is strongly recommended that the airway (if equipment is available) be monitored continuously through Capnography and Pulse Oximetry.**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Airway: RSI

Clinical Indications:

- Airway obstruction
- Respiratory insufficiency
- Decreased mental status resulting in airway compromise
- Potential airway compromise

Consider intubation without RSI in:

- Cardiac Arrest
- Difficult Airway (anticipated inability to intubate or ventilate)
- Crash airway (imminent arrest, unable to ventilate)

Procedure:

- Understand that if multiple providers are on scene many of the following steps can be done congruently.
1. Open airway and pre-oxygenate (perform a nitrogen washout) via NRB or BVM as appropriate with maximum flow rate for 3-5 minutes. Add a standard nasal cannula at maximum available flow rate under NRB/BVM.
 2. Attach patient to cardiac monitor. Monitor ECG and vitals frequently.
 3. Ensure patent IV/IO access, consider secondary access if time allows.
 4. If hemodynamically unstable consider fluid challenge or vasopressors.
 5. If pulse oximetry remain <94% after pre-oxygenation, consider adding PEEP at 10 cmH₂O to BVM if possible. Assure mask seal is maintained to facilitate CPAP effect, two person technique preferred. Attempt to increase SpO₂ to over 95% for 3 minutes, if unable proceed to intubation.
 6. If the patient is agitated and pre-oxygenation is inhibited, consider sedation.
 7. Assess difficulty of intubation using preferred mnemonic (LEMON, HEAVEN)
 8. Assemble all required equipment including:
 - a. Suction unit
 - b. Desired ETT plus one size smaller.
 - c. 10cc syringe
 - d. Lubricant
 - e. Laryngoscope with appropriate blade. Video laryngoscopy should be used for the first attempt whenever possible.
 - f. Assistive devices (bougie or appropriate stylet)
 - g. King/i-Gel
 - h. Surgical/Needle cricothyrotomy kit
 - i. Commercial ETT securing device
 - j. Nasogastric/orogastric tube
 - k. ETT EtCO₂ device
 - l. Ventilator
 - m. Stethoscope
 9. Suction oropharynx as needed.
 10. Position patient to facilitate successful intubation. In non-trauma patients, elevate head of bed to 30 – 45 degrees. In trauma patients, elevate head of backboard if immobilized. At a minimum, position external auditory canal at the level of the sternal notch. Use padding behind shoulders in pediatric patients to align airway (sniffing position).

Standards Procedure (Skill)

Airway: RSI Cont.

11. Once the patient's physiology, position, and intubating conditions are optimized proceed with the RSI
 12. During intubation, RSI medication may cause cardiac depression. Specifically, be aware that neuromuscular blockers may cause a significant decrease in sympathetic tone, resulting in a drop in blood pressure.

- a. In patients with low/borderline blood pressures, use push dose epinephrine prior to administration of induction or neuromuscular blocking agents to counteract loss of sympathetic tone.

See **Hypotension/Shock (Non-Trauma), Adult Multisystem Trauma**

- b. **Pediatric patients ≤ 28 days:**

- i. Consider pre-medication with Atropine 0.02 mg/kg IV

13. In patients at risk for increased ICP, consider pre-treatment with Fentanyl and/or Lidocaine to attenuate the sympathetic response to laryngoscopy.

- a. **Fentanyl:** (Do not administer to hypovolemic or hypotensive patients.)

Adult and Pediatric Dose: 1- 2 mcg/kg Fentanyl slow IV push over 30-60 seconds.

- b. **Lidocaine:**

Adult and Pediatric Dose: 1.5mg/kg slow IV/IO push over 3-5 minutes. Administer 3-5 minutes before intubation.

14. Induction agents:

If Midazolam or Etomidate are used for induction an analgesic must also be used to manage pain associated with intubation.

- a. **Ketamine**

- i. Adult & Pediatric dose: 1-2 mg/kg Ketamine slow (over 1-2 minutes) IV/IO push one minute prior to administration of paralytic.

- ii. In severely hypotensive patients (Septic or other catecholamine-deficient states) after repleting catecholamine's (usually via push dose Epinephrine), administer 1mg/kg Ketamine IV/IO for induction.

- iii. Although rarely needed, if hyper-salivation occurs, treat with Atropine:

1. Adult 0.25 mg Atropine IV/IO. Repeat PRN

2. Pediatric 0.01 mg/kg Atropine IV/IO. Repeat PRN, max 1 mg.

- iv. Contraindications:

1. Patients >3mo old

2. Schizophrenia

3. Caution in cardiogenic shock

4. Caution in patients with severe hypertension

- b. **Midazolam (Versed):**

- i. Adult dose: 2.5-5mg Midazolam IV/IO three minutes prior to paralytic administration if possible. Consider the smaller dose of Midazolam if hypotensive or if pre-medicated with narcotics prior to induction.

- ii. Pediatric: Unless, hypotensive, pre-medicate with Fentanyl 1-2 mcg/kg to augment Midazolam induction. Then proceed with 2.5-5mg Midazolam IV/IO.

- c. **Etomidate:**

- i. Adult & Pediatric dose: 0.3 mg/kg Etomidate IV/IO. May repeat x2.

- ii. Contraindication: Use with caution in sepsis, hypotension and/or adrenal insufficiency.

Standards Procedure (Skill)

Airway: RSI Cont.

15. Paralytic agents:

a. **Succinylcholine** (drug of choice for most patients):

i. Adult and Pediatric ≥ 10 years old dose: 1-2 mg/kg Succinylcholine IV/IO (Max of 200mg)

ii. Contraindications:

1. Patients < 10 years old
2. Hyperkalemia
3. Renal failure/dialysis
4. Rhabdomyolysis
5. Prolonged crush Injuries
6. Severe hypothermia
7. Muscular dystrophy
8. Myopathy
9. Burns over 24 hours old
10. History of malignant hyperthermia.

iii. When cardiac arrest occurs immediately or shortly after administration of Succinylcholine, unless the cause is felt to be due to inadequate oxygenation or ventilation, management should include immediate treatment for hyperkalemia. See Hyperkalemia Protocol.

iv. Do not repeat Succinylcholine as repeat doses may cause bradycardia or asystole. Use Rocuronium if an additional paralytic dose is needed or if Succinylcholine is contraindicated.

b. **Rocuronium** (Zemuron)

i. Adult and Pediatric dose: 0.5-1mg/kg IV/IO or 1.8mg/kg IM

iii. Use with caution in patients with potential difficult airways due to the length of time of paralysis.

c. **Vecuronium**

i. Adult and Pediatric dose: 0.1mg/kg IV/IO

16. Once patient is paralyzed, perform intubation:

- a. If you are unable to intubate before pulse oximeter saturations begin to drop, stop and ventilate the patient for 30-60 seconds and consider making a change in technique or equipment.
- b. Two intubation attempts per team member is the maximum.
- c. If intubation attempts fail, consider rescue airway or continued BVM if able to ventilate.
- d. If rescue airway and BVM fail, consider Surgical Cricothyrotomy or Needle Cricothyrotomy.

17. In addition to ETCO₂, verify placement by at least two separate techniques:

- a. Continuous waveform capnography (GOLD STANDARD).
- b. Auscultate for bilateral breath sounds and absent gastric sounds.
- c. Observe for equal chest rise and fall.
- d. Maintenance or increase in SpO₂.
- e. Misting of tube in correlation with ventilations
- f. Chest radiograph (If time and patient condition allows. Do not delay transport for a chest x-ray)

Standards Procedure (Skill)

Airway: RSI Cont.

18. Secure tube at proper depth. It is best to visualize ETT depth, passing the balloon approximately 1 cm past the vocal cords or placing the cord marker at the vocal cords. Otherwise, approximate ETT depth at the incisors or gum line (in cm):

- a. Patients $\geq$ 5 feet (60 inches): (height in inches/4) + 4 (usually 21 – 24 cm)
- b. Patients < 5 feet tall: 3 X ETT size (pediatric)

19. Consider placing a c-collar to help maintain tube placement, especially on pediatric patients.

18. After ETT placement, maintain sedation for patient comfort as well as crew and patient safety. It is not necessary to maintain paralysis on every patient but consider continued paralysis for patients with a history of combativeness/agitation, while taking into account the constraints of the ambulance, patient size, and crew safety. For other patients, consider using sedation only without ongoing paralysis. To maintain sedation, administer:

- a. Versed 1-10mg/hr - concurrent treatment with analgesia is required
- b. Ketamine: 1-2mg/kg/hr
- c. May continue hospital initiated sedation as long as provider has familiarized themselves with the medication

20. Consider NG/OG tube to facilitate ventilation.

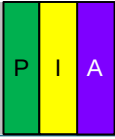
21. Monitor for complications, including post-intubation hypoxia. Use DOPERS mnemonic for troubleshooting:

- D**isplacement of ETT, BVM, or ventilator circuit
- O**bstruction of ETT including mucous plugs, BVM, or ventilator circuit
- P**neumothorax, pulmonary embolism, pulmonary edema, collapse, bronchospasm
- E**quipment failure- ventilator, BVM
- R**igidity of the chest wall
- S**tacked breaths- bronchospasm and/or ventilator settings

22. Document the methods used to verify ET tube position, depth of ET tube, and vital signs at time of transport. Recommend tube position be verified via signature by Physician caring for patient prior to transferring care to the facility and/or other CRH EMS personnel.

23. CRH EMS personnel MUST send an email to the Wyoming Office of EMS within two hours of the RSI to wdh-oems@wyo.gov, Medical Director, CRH EMS Director, CRH EMS Administrative Manager and current CRH leadership team with the following information:

- a. Agency
- b. Date
- c. Approximate time of the procedure
- d. WATRS EMS Response Number



Standards Procedure (Skill)

Airway – Nebulizer Inhalation Therapy

Clinical Indications:

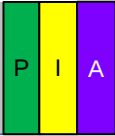
- Patients experiencing bronchospasm/stridor.

Procedure:

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug (such as Albuterol or other approved drug) into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 4 - 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
7. Monitor the patient for medication effects. This should include the patient's assessment of his/her response to the treatment and reassessment of vital signs, EKG, and breath sounds.
8. Assess and document peak flows before and after nebulizer treatments.
9. Document the treatment, dose, and route on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Airway: Suctioning-Advanced

Clinical Indications:

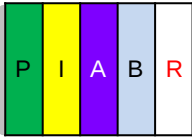
- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as a naso-tracheal tube, endotracheal tube, tracheostomy tube, or a cricothyroidotomy tube.

Procedure:

1. Ensure suction device is in proper working order.
2. Pre-oxygenate the patient as is possible.
3. Attach suction catheter to suction device, keeping sterile plastic covering over catheter.
4. Using the suprasternal notch and the end of the airway catheter as guides, measure the desired depth for the catheter (judgment must be used regarding the depth of suctioning with cricothyroidotomy and tracheostomy tubes).
5. If applicable, remove ventilation devices from the airway.
6. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
7. Once the desired depth (measured in #4 above) has been reached, occlude the thumb port and remove the suction catheter slowly. Suction for no longer than 10 seconds in adults and children, and 3 seconds in infants, and 1-3 seconds in neonates.
8. A small amount of Normal Saline (Adult:: 3-5 ml; Peds: 1-2ml) may be used if needed to loosen secretions for suctioning.
9. Re-attach ventilation device (e.g., bag-valve mask) and ventilate the patient
10. Document time and result in the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Airway: Upper Airway Suctioning

Clinical Indications:

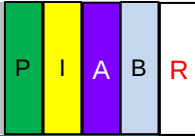
- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

Procedure:

1. Ensure suction device is in proper working order with suction tip in place.
2. Pre-oxygenate the patient as is possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
5. If applicable, remove ventilation devices from the airway.
6. Use the suction device to remove any secretions, blood, or other substance. Suction for no longer than 10-15 seconds.
7. The alert patient may assist with this procedure.
8. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient
9. Record the time and result of the suctioning in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Stroke Screen: BE-FAST & VAN Prehospital

Clinical Indications:

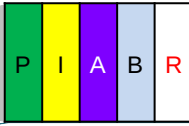
- Suspected Stroke/CVA Patient.

B.E-F.A.S.T Procedure:

1. Assess and treat suspected stroke patients as per appropriate guidelines.
2. The BeFast stroke assessment should be completed for all suspected stroke/CVA patients.
3. Perform stroke assessment through physical exam using the mnemonic **BeFast**:
BALANCE: Assess for sudden onset unsteady gait or sudden onset lack of coordination in any extremity
EYES: Assess for impairment of vision in one or both eyes, sudden blurring of vision or double vision
FACIAL DROOP: Have the patient smile or show their teeth.
Normal: Both sides of the face move equally.
Abnormal: One side of the face does not move as well (or at all) as the other.
ARM DRIFT: Have the patient close their eyes and hold their arms out straight with their palms up for 10 seconds.
Normal: Both arms move equally or not at all.
Abnormal: One arm does not move, or one arm drifts down.
SPEECH: Have the patient say, "You can't teach an old dog new tricks."
Normal: Patient uses correct words with no slurring.
Abnormal: Slurred speech, inappropriate words or mute.
TIME: Note the last time the patient was "normal" and assume as time of onset.
4. Patients with an abnormal finding for 1 of the above exam elements has a 72% probability for stroke. Patients with 3 abnormal findings have an 85% probability for stroke.
5. Evaluate the patient's blood glucose level.
6. If the "Time Last Normal" is less than 3 hours, blood glucose is between 60 and 400 mg/dL, and at least one of the physical exam elements is positive:
 -Follow the **Suspected Stroke/CVA Guideline**.
 -Alert receiving hospital of a possible stroke patient as early as possible.
7. All sections of the BeFast must be completed and documented as positive or negative.

V.A.N Procedure:

Assess for arm weakness (drift, or hemi-paralysis). If the patient has a positive arm weakness sign, Move on and complete the VAN assessment:
 Assess for **Visual disturbance** such as trouble seeing, blurred/double vision, visual field defect or blindness.
 Assess for **Aphasia**. The patient may have slurred speech, inability to speak or understand. (Naming two objects, following commands and repeating a phrase.)
 Assess for **Neglect**: the patient may have gaze to one side or ignoring one side.
 If the patient is VAN positive and the last known normal is within 24 hours, alert the receiving hospital of a stroke activation as soon as possible and follow the Suspect Stroke/CVA Guideline.
***Note that a positive VAN scale is Arm weakness AND any of the three positive V.A.N assessments**



Standards Procedure (Skill)

Pain Assessment and Documentation

Clinical Indications:

- Any patient with pain.

Definitions:

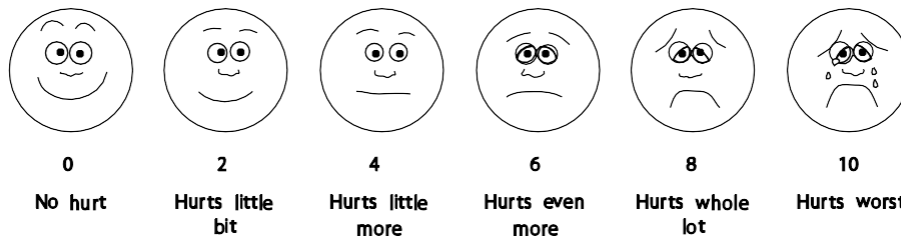
- Pain is an unpleasant sensory and emotional experience

associated with actual or potential tissue damage.

- Pain is subjective (whatever the patient says it is).

Procedure:

- Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
- Pain should be assessed and documented in the PCR during initial assessment, before starting pain control treatment, and with each set of vitals.
- Pain should be assessed using the appropriate approved scale.
- Three pain scales are available: the 0 – 10, the Wong - Baker "faces", and the FLACC.
 - 0 – 10 Scale:** the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.
 - Wong – Baker "FACES" scale:** this scale is primarily for use with pediatrics but may also be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value.



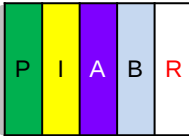
- FLACC scale:** this scale has been validated for measuring pain in children with mild to severe cognitive impairment and in pre-verbal children (including infants).

Categories	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs; frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to; distractible	Difficult to console or comfort

FLACC = Face, Legs, Activity, Cry, Consolability

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Assessment: Pediatric

Clinical Indications:

Any Child that can be measured with the Broselow-luten Resuscitation Tape

Procedure:

1. Scene size-up, including universal precautions, scene safety, environmental hazards assessment, need for additional resources, by-stander safety, and patient/caregiver interaction.
2. Assess patient using the pediatric triangle of ABCs:
 - **Airway and appearance:** speech/cry, muscle tone, inter-activeness, look/gaze, movement of extremities.
 - **Work of Breathing:** absent or abnormal airway sounds, use of accessory muscles, nasal flaring, body positioning.
 - **Circulation to skin:** pallor, mottling, cyanosis.
3. Establish spinal immobilization if suspicion of spinal injury.
4. Establish responsiveness appropriate for age (AVPU, GCS, etc.).
5. Color code using Broselow-Luten tape.
6. Assess disability (pulse, motor function, sensory function, papillary reaction)
7. Perform a focused history and physical exam. Recall that pediatric patients easily experience hypothermia and thus should not be left uncovered any longer than necessary to perform an exam.
8. Record vital signs (BP > 3 years of age, cap refill < 3 years of age).
9. Include Immunizations, Allergies, Medications, Past Medical History, last meal, and events leading up to injury or illness where appropriate.
10. Treat chief complaint as per appropriate protocol.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Assessment: Pediatric Quick Reference

Pediatric Color-Coded Length-Based Resuscitation Tape

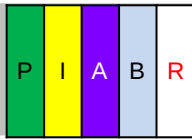
Equipment	GRAY* 3-5 kg	PINK Small Infant 6-7 kg	RED Infant 8-9 kg	PURPLE Toddler 10-11 kg	YELLOW Small Child 12-14 kg	WHITE Child 15-18 kg	BLUE Child 19-23 kg	ORANGE Large Child 24-29 kg	GREEN Adult 30-36 kg
Resuscitation bag		Infant/child	Infant/child	Child	Child	Child	Child	Child	Adult
Oxygen mask (NRB)		Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric/adult
Oral airway (mm)		50	50	60	60	60	70	80	80
Laryngoscope blade (size)		1 Straight	1 Straight	1 Straight	2 Straight	2 Straight	2 Straight or curved	2 Straight or curved	3 Straight or curved
ET tube (mm) [†]		3.5 Uncuffed 3.0 Cuffed	3.5 Uncuffed 3.0 Cuffed	4.0 Uncuffed 3.5 Cuffed	4.5 Uncuffed 4.0 Cuffed	5.0 Uncuffed 4.5 Cuffed	5.5 Uncuffed 5.0 Cuffed	6.0 Cuffed	6.5 Cuffed
ET tube insertion length (cm)	3 kg 9-9.5 4 kg 9.5-10 5 kg 10-10.5	10.5-11	10.5-11	11-12	13.5	14-15	16.5	17-18	18.5-19.5
Suction catheter (F)		8	8	10	10	10	10	10	10-12
BP cuff	Neonatal #5/Infant	Infant/child	Infant/child	Child	Child	Child	Child	Child	Small adult
IV catheter (ga)		22-24	22-24	20-24	18-22	18-22	18-20	18-20	16-20
IO (ga)		18/15	18/15	15	15	15	15	15	15
NG tube (F)		5-8	5-8	8-10	10	10	12-14	14-18	16-18
Urinary catheter (F)	5	8	8	8-10	10	10-12	10-12	12	12
Chest tube (F)		10-12	10-12	16-20	20-24	20-24	24-32	28-32	32-38

Abbreviations: BP, blood pressure; ET, endotracheal; F, French; IO, intraosseous; IV, intravenous; NG, nasogastric; NRB, nonrebreathing.

*For Gray column, use Pink or Red equipment sizes if no size is listed.

[†]Per 2010 AHA Guidelines, in the hospital cuffed or uncuffed tubes may be used (see below for sizing of cuffed tubes).

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Standards Procedure (Skill)

Pediatric Transportation/ACR

Clinical Indications:

- Pediatric patient requiring transportation via ambulance that cannot be safely transported normally. (patients from 2kg-45kg).
- An ill or injured child must be restrained in a manner that minimizes injury in an ambulance crash. The best location for transporting a pediatric patient is secured directly to the ambulance cot.

ACR Procedure:

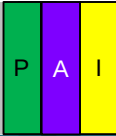
1. Determine the patients weight.
2. Select the appropriate "color" of the ACR device. (XS, S, M, L)
3. Attach all four points of the ACR device to the EMS Cot.
4. Place patient over straps and secure the straps appropriately. Monitor distal CSM during transport, loosen straps as necessary.
5. Transport the patient.

Convertible Car Seat:

Convertible car seat with two belt paths (front and back) with four points for belt attachment to the cot is considered best practice, when available, for pediatric patients who can tolerate a semi-upright position.

1. Position safety seat on cot facing foot-end with backrest elevated to meet back of child safety seat.
2. Secure safety seat with 2 pairs of belts at both forward and rear points of seat.
3. Place shoulder straps of the harness through slots just below child's shoulders and fasten snugly to child.
4. Follow manufacturer's guidelines regarding child's weight.

Note: Non-convertible safety seats cannot be secured safely to cot. If child's personal safety seat is not a convertible seat, it cannot be used on the cot.



Standards Procedure Blood Culture Collection

Clinical Indications:

- Sepsis protocol- prior to starting antibiotics
- During treatment of a blood administration reaction- prior to the start of antibiotics

Procedure:

1. Swab patient's skin with a Chloraprep/Alcohol-prep, concentrically, for a minimum of 15 seconds. Start at the center and gradually widen the area to be cleaned. Allow to air dry.

- Do not palpate the vein after disinfecting the area

2. Swab the bottle tops with alcohol (not betadine) prior to inoculation

3. Draw blood into sterile syringe

4. Change needles on syringe

5. Deliver 8-10 ml with a minimum of 5 ml blood into bottles (vacutainer adapter may be used if desired)

- There are 2 bottles that need to be used, **Frist** is BACTEC Lutic/10 **Anaerobic/F** and BACTEC Plus+ **Aerobic/F** last. **Both must ideally have 8-10 ml of blood injected into them.**
- If too much blood is used, over inoculation (false positive) can occur.
- Pediatric bottles must be inoculated with 1-3 ml of blood.

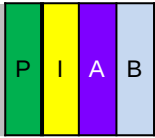
6. Repeat at second site on the opposite arm

- A single blood culture may miss intermittently occurring bacteremia and make it difficult to interpret the clinical significance of certain isolated organisms.

7. Each bottle must be labeled with the patient's name, birth date, time and date of collection, collectors initials and collection site, i.e. left Antecubital, right hand, etc. **They will be rejected if not properly labeled!** Do not put any label or writing over the bar code as that will also make it unusable.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Blood Glucose Analysis

Clinical Indications:

- Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis can be obtained through a finger-stick, or when possible, simultaneously with intravenous access.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the analysis and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and as per protocol.
7. Perform Quality Assurance on glucometers at least once every 7 days, if any clinically suspicious readings are noted, document and replace.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure

Blood transfusion

Clinical Indications:

- HR >110 AND systolic BP <90mmHg
- SBP <70 mmHg
- Penetrating injury or blunt trauma with significant injury
- The Administration of blood or blood components by the Cody Regional Paramedic is considered an emergent situation where the paramedic uses clinical judgment to increase patient survival. Medical Control should be contacted when possible prior to initiation of a blood product(911) Written orders from sending Physician (IFT)

Procedure:

1. 2 units of PRBC's* will be obtained from blood bank prior to departure on call.(911)
 - i. Ordered blood products obtained along with written order from sending facility(IFT)
2. Obtain baseline vital signs including temperature and document.
3. Prime Blood-Y set with normal saline per manufactures recommendations. Insure all air is expelled and in-line filter is covered with normal saline.
4. Remove Blood product from blood cooler and verify type and expiration date,
 - i. document the unit # and expiration date on the transport record.
5. If transfusing FFP* remove the unit from the cooler, verify the unit type (A-AB) along with expiration date and FFP unit #. Ensure FFP are adequately thawed before admin for 20 minutes and meeting a temperature of at least 37 degrees Celsius (IFT ONLY)
6. Spike the blood product using aseptic technique and adjust the flow utilizing the roller clamp.
7. Document the start of transfusion time on the transport record and complete the information on the tag attached to the unit.
8. If possible, administer the first 50cc of blood over 15 minutes observing for signs of transfusion reaction, If patient tolerates increase the rate and indicated via written order (IFT) or as the patient condition indicates(911)
9. Continue close monitoring of patient, recording vital signs and temperature every 15 minutes or less.
10. Upon completion of blood products, remove blood unit tag, maintain IV site with NS, remove blood product and tubing and place in a bio-hazard bag.
10. Complete all documentation, noting post admin vital signs, temperature and time of completion.

***PRBC- Packed Red Blood Cells**

***FFP-Fresh Frozen Plasma**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Cardioversion

Clinical Indications:

- Unstable patient with a tachydysrhythmia (rapid atrial fibrillation, supraventricular tachycardia, ventricular tachycardia).
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation).

Procedure:

1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
3. Consider the use of pain or sedating medications.
4. Set energy selection to the appropriate setting.
5. Set monitor/defibrillator to synchronized cardioversion mode.
6. Make certain all personnel are clear of patient.
7. 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 a delay between activating the cardioversion and the actual delivery of energy.
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient's rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation, following the procedure for Defibrillation-Manual.
9. If the patient's condition is unchanged, repeat steps 2 to 8 above, using escalating energy settings.
10. Repeat until maximum setting or until efforts succeed. Consider discussion with medical control if cardioversion is unsuccessful after 2 attempts.
11. Note procedure, response, and time in the patient care report (PCR).

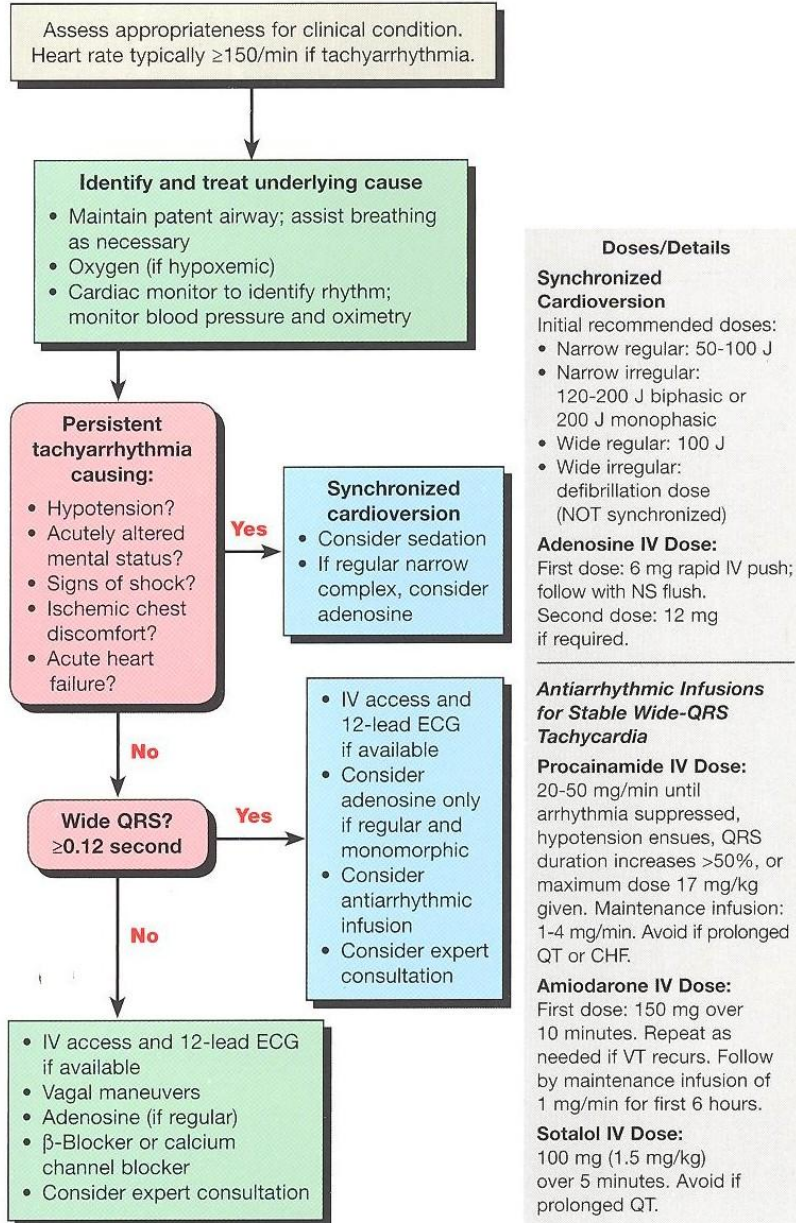
Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle., or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Cardioversion

Tachycardia With a Pulse Algorithm



P

Standards Procedure (Skill)

Criteria for Death / Withholding Resuscitations**Clinical Indications:**

CPR and ALS treatment are to be withheld only if the patient is obviously dead or **Wyoming State Care One Bracelet and/or Do Not Resuscitate** form (see separate policy) is present.

Procedure:

1. If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR and ALS therapy need not be initiated:

- Body decomposition

- Rigor mortis

- Dependent lividity

- Blunt force trauma

- Injury not compatible with life (i.e., decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction)

- Extended downtime with Asystole on the ECG

- Lack of/no cardiac activity on cardiac exam during Ultrasound exam

2. If a bystander or first responder has initiated CPR or automated defibrillation prior to an EMS paramedic's arrival and any of the above criteria (signs of obvious death) are present, EMS personnel may discontinue efforts. If the initial attempts at CPR were started by a higher level of care, medical control must be contacted.

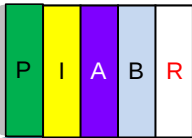
3. If doubt exists, start resuscitation immediately. Once resuscitation is initiated, continue resuscitation efforts until either:

- a) Resuscitation efforts meet the criteria for implementing the **Discontinuation of Prehospital Resuscitation Policy** (see separate policy)

- b) Patient care responsibilities are transferred to the destination hospital staff.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Cardiopulmonary Resuscitation

Clinical Indications:

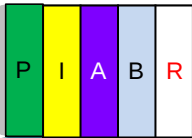
- Basic life support for the patient in cardiac arrest in accordance with 2025 AHA Guidelines.

Procedure:

1. Assess the patient's level of responsiveness (shake and shout).
2. If no response, open the patient's airway with the head-tilt chin-lift and look, listen and feel for respiratory effort. If the patient may have sustained C-spine trauma, use the modified jaw thrust while maintaining immobilization of the C-spine. For infants, positioning the head in the sniffing position is the most effective method for opening the airway.
3. If the patient is an adult, go to step 4. If no respiratory effort in a pediatric patient, give 2 ventilations. If air moves successfully, go to step 4. If air movement fails, proceed to the Airway Obstruction Procedure.
4. Check for pulse (carotid for adults and older children, brachial for infants) for no more than 10 seconds. If no pulse, begin CPR with chest compressions based on charts in CardioPulmonary Resuscitation Procedures 22B and 22C.
5. Begin ventilations in the adult and pediatric in accordance with 2025 AHA Guidelines.
6. Provide no more than 12 breaths per minute with the BVM. Use EtCO₂ to guide your ventilations as directed in the Cardiac Arrest Protocol.
7. Chest compressions should be provided in an uninterrupted manner. Only brief interruptions are allowed for rhythm analysis, defibrillation, and performance of procedures.
9. Deploy Lucas as deemed appropriate
10. Document the time and procedure in the Patient Care Report (PCR).
11. Refer to 2025 AHA Adult BLS Algorithm for Healthcare Providers (22B) and Pediatric BLS Algorithm for Healthcare Providers (22C) to guide resuscitation.
12. Refer to 2025 AHA Summary of Steps of CPR (22D) to guide resuscitation.
13. Consider using the portable Ultrasound to diagnose fine vFib or PEA if there is a question as to presence or absence. Use the Parasternal Long-Axis View to view cardiac activity.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Concussions Procedure

Clinical Indications:

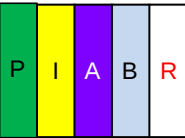
- Suspected concussion following a head injury.
- Patient exhibits signs of confusion, amnesia, dizziness, headache, vision disturbance, or balance problems.
- Any level of loss of consciousness observed after head trauma.

Procedure:

1. **Initial Assessment:** Evaluate the patient's level of consciousness. Use the AVPU scale (Alert, Voice, Pain, Unresponsive) to determine responsiveness.
2. **Symptom Evaluation:** Ask the patient about headache, nausea, balance problems, or memory issues. Assess their ability to follow simple commands and check for visible signs of injury to the head.
3. **Physical Examination:** Perform a brief neurological exam, checking pupils for equality and reaction to light, examining head for bumps or bruises, and assessing neck for pain or stiffness.
4. **Cognitive Assessment:** Employ simple questions to evaluate memory and concentration, such as asking the patient to repeat a set of words or to recall recent events.
5. **Monitor:** Observe the patient for worsening symptoms. Repeat assessments every 15 minutes for the first hour, then periodically depending on the severity of the symptoms.
6. **Advise:** Inform the patient or guardian about the signs of worsening condition that would require immediate medical evaluation

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

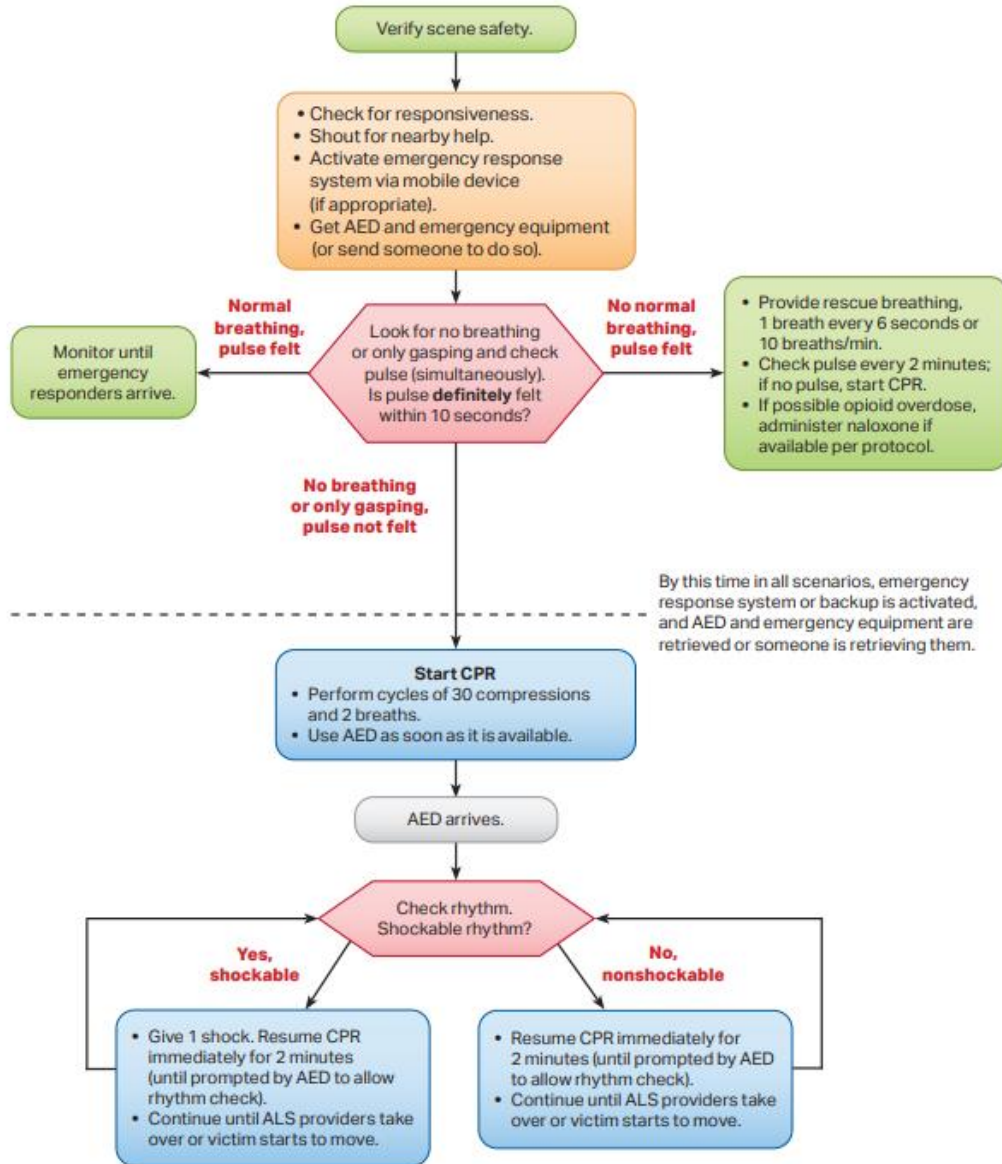


Standards Procedure (Skill)

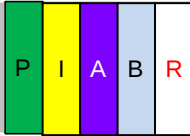
Adult BLS CPR

(continued)

Adult Basic Life Support Algorithm for Healthcare Providers



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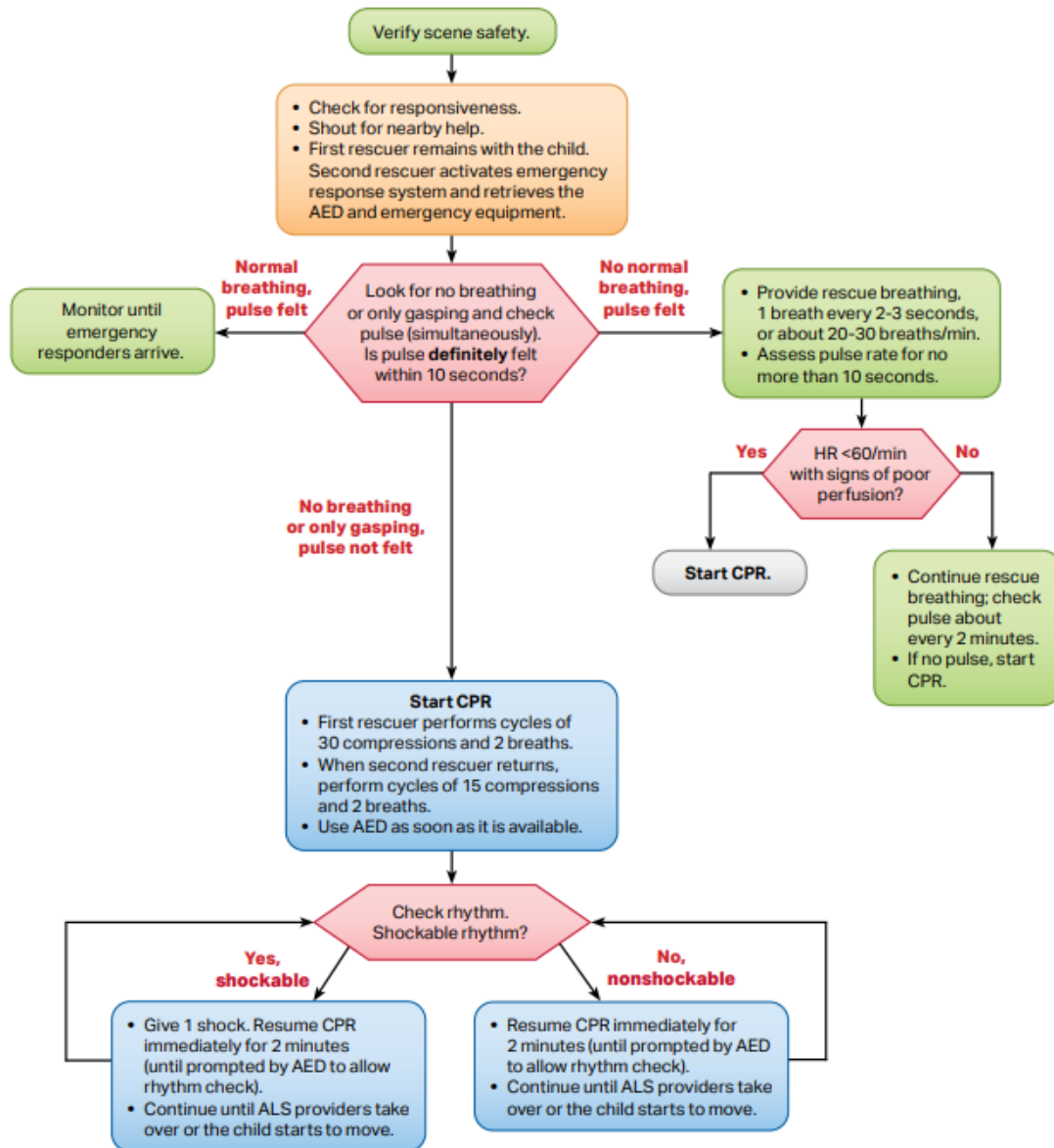


Standards Procedure (Skill)

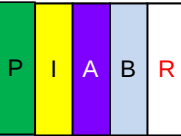
Pediatric BLS CPR

(continued)

Pediatric Basic Life Support Algorithm for Healthcare Providers—2 or More Rescuers



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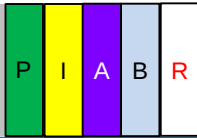
Standards Procedure (Skill)

Summary of Steps of CPR

Summary of Steps of CPR for Adults, Children, and Infants

Component	Recommendations		
	Adults	Children	Infants
Recognition	Unresponsive (for all ages)		
	No breathing or no normal breathing (ie, only gasping)	No breathing or only gasping	
	No pulse felt within 10 seconds		
CPR sequence	Chest compressions, Airway, Breathing (C-A-B)		
Compression rate	At least 100/min		
Compression depth	At least 2 inches (5 cm)	At least 1/3 AP diameter About 2 inches (5 cm)	At least 1/3 AP diameter About 1 1/2 inches (4 cm)
Chest wall recoil	Allow complete recoil between compressions Rotate compressors every 2 minutes		
Compression interruptions	Minimize interruptions in chest compressions Attempt to limit interruptions to <10 seconds		
Airway	Head tilt–chin lift (suspected trauma: jaw thrust)		
Compression-to-ventilation ratio (until advanced airway placed)	30:2 1 or 2 rescuers	30:2 Single rescuer 15:2 2 rescuers	
Ventilations with advanced airway	1 breath every 6-8 seconds (8-10 breaths/min) Asynchronous with chest compressions About 1 second per breath Visible chest rise		
Defibrillation	Attach and use AED as soon as available. Minimize interruptions in chest compressions before and after shock; resume CPR beginning with compressions immediately after each shock.		

Abbreviations: AED, automated external defibrillator; AP, anterior-posterior; CPR, cardiopulmonary resuscitation.



Standards Procedure (Skill)

Defibrillation: Automated

Clinical Indications:

- Patients in cardiac arrest (pulseless, apneic)

Contraindications

- Pediatric patients who are so small that the pads cannot be placed without touching one another.

Procedure:

- 1. If multiple rescues available, one rescuer should provide uninterrupted chest compressions while the AED is being prepared for use.**
2. Apply defibrillator pads per manufacturer recommendations. Use alternate placement when implanted devices (pacemakers, AICDs) occupy preferred pad positions.
3. Remove any medication patches on the chest and wipe off any residue.
4. If necessary, connect defibrillator leads: white to the anterior chest pad and the red to the posterior pad.
5. Activate AED for analysis of rhythm.
- 6. Stop CPR and clear the patient** for rhythm analysis. Keep interruption in CPR as brief as possible.
7. Defibrillate if appropriate by depressing the “shock” button. Assertively state “CLEAR” and visualize that no one, including yourself, is in contact with the patient prior to defibrillation. The sequence of defibrillation charges is preprogrammed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
8. Begin CPR (chest compressions and ventilations) immediately after the delivery of the defibrillation.
9. After 2 minutes of CPR, analyze rhythm and defibrillate if indicated. Repeat this step every 2 minutes.
10. If “no shock advised” appears, perform CPR for two minutes and then reanalyze.
11. Transport and continue treatment as indicated.
- 12. Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.**
- 13. If pulse returns use the Post Resuscitation Guideline or other appropriate guideline.**

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.



Standards Procedure (Skill)

Defibrillation: Manual

Clinical Indications:

- Cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia.

Procedure:

- 1. Ensure that Chest Compressions are adequate and interrupted only when absolutely necessary.**
- Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
- After application of an appropriate conductive agent if needed, apply defibrillation hands free pads (recommended to allow more continuous CPR) or paddles to the patient's chest in the proper position:
 - Paddles: right of sternum at 2nd ICS and anterior axillary line at 5th ICS.
 - Pads: anterior-posterior position.
- Set the appropriate energy level.
- Charge the defibrillator to the selected energy level. **Continue chest compressions while the defibrillator is charging.**
- 6. Hold Compressions, assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.**
- Deliver the defibrillation by depressing the **shock button**, for hands free operation.
- Immediately resume chest compressions and ventilations for 2 minutes. After 2 minutes of CPR, analyze rhythm and check for pulse only if appropriate for rhythm.
- Repeat the procedure every two minutes as indicated by patient response and ECG rhythm.
- Keep interruption of CPR compressions as brief as possible. Adequate CPR is a key to successful resuscitation.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Standards Procedure (Skill)

Discontinuation of Prehospital Resuscitation

Clinical Indications:

- Allow for discontinuation of prehospital resuscitation after the delivery of adequate and appropriate ALS therapy.

Procedure:

1. Discontinuation of CPR and ALS intervention may be implemented **prior to contact with Medical Control** if **ALL** of the following criteria have been met:

Patient must be 18 years of age or older

Adequate CPR has been administered

- Airway has been successfully managed with verification of device placement. Acceptable management techniques include orotracheal intubation, nasotracheal intubation, Blind Insertion Airway Device (BIAD) placement, or cricothyrotomy
- IV or IO access has been achieved

No evidence or suspicion of any of the following:

Drug/toxin overdose Active

internal bleeding

Hypothermia

Preceding trauma

Rhythm appropriate medications and defibrillation have been administered according to local EMS Protocols for a total of 3 cycles of drug therapy without return of spontaneous circulation (palpable pulse)

All EMS paramedic personnel involved in the patient's care agree that discontinuation of the resuscitation is appropriate

2. Consider using the portable Ultrasound to confirm lack of organized cardiac contractions. Use the **Parasternal Long-Axis View** procedure on the left side, medial to midclavicular so as to align the probe with the heart. Increase the depth and look for the heart instead of the lung.

3. If all of the above criteria are not met and discontinuation of prehospital resuscitation is desired, **contact Medical Control**.

4. The [Deceased Subjects Policy](#) should be followed.

Document all patient care and interactions with the patient's family, personal physician, medical examiner, law enforcement, and medical control in the EMS patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.

Standards Procedure (Skill)

Cardiac: External 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/pacing pads to chest and back:
 - One pad to left mid chest next to sternum
 - One pad to mid left posterior chest next to spine.
3. Rotate selector switch to pacing option.
4. Adjust heart rate to 70 BPM for an adult and 100 BPM for a child.
5. Note pacer spikes on EKG screen.
6. Slowly increase output until capture of electrical rhythm on the monitor.
7. If unable to capture while at maximum current output, 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.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

P

Standards Procedure (Skill)

Chest Decompression

(Angiocath)

I

M

Clinical Indications:

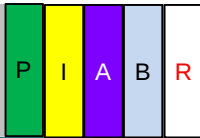
- Patients with hypotension (SBP <90), clinical signs of shock, and at least one of the following signs:
 - Jugular vein distention.
 - Tracheal deviation away from the side of the injury (often a late sign).
 - Absent or decreased breath sounds on the affected side.
 - Hyper-resonance to percussion on the affected side.
 - Increased resistance when ventilating a patient.
- Patients in traumatic arrest with chest or abdominal trauma for whom resuscitation is indicated. These patients may require bilateral chest decompression even in the absence of the signs above.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Administer high flow oxygen.
3. Identify and prep the site:
 - Locate the second intercostal space in the mid-clavicular line or the fourth intercostal space mid-axillary on the same side as the pneumothorax.
 - Prepare the site with providone-iodine ointment or solution.
4. Insert the catheter (10 gauge for adults, 14 gauge pediatrics) into the skin over the third rib and direct it just over the top of the rib (superior border) into the interspace.
5. Advance the catheter through the parietal pleura until a “pop” is felt and air or blood exits under pressure through the catheter, then advance catheter only to chest wall.
6. Remove the needle, leaving the plastic catheter in place.
7. Secure the catheter hub to the chest wall with Asherman Chest Seal.
8. Alternatively, consider placing a finger cut from an exam glove over the catheter hub. Cut a small hole in the end of the finger to make a flutter valve. Secure the glove finger with tape or a rubber band. (Note – don’t waste much time preparing the flutter valve; if necessary control the air flow through the catheter hub with your gloved thumb).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation once per certification cycle.



Standards Procedure (Skill)

Childbirth

Clinical Indications:

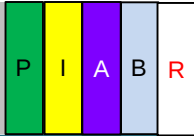
- Imminent delivery with crowning.

Procedure:

1. Delivery should be controlled so as to allow a slow, controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check if the umbilical cord is surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the mouth then nose with a bulb syringe as the infant's head emerges.
5. Grasping the head with hands over the ears, gently pull down to allow delivery of the anterior shoulder.
6. Gently pull up on the head in same fashion to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record APGAR scores at 1 and 5 minutes.
10. Follow the **Newly Born Guideline** for further treatment.
11. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
12. Massaging the uterus may facilitate delivery of the placenta and decrease bleeding by facilitating uterine contractions.
13. Continue rapid transport to the hospital.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill) Decontamination

Clinical Indications:

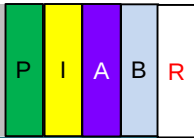
- Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons.

Procedure:

- In coordination with HAZMAT and other Emergency Management personnel, establish **HOT**, **WARM** and **COLD** zones of operation.
- Ensure that personnel assigned to operate within each zone have proper personal protective equipment.
- In coordination with other public safety personnel, assure each patient from the **HOT** zone undergoes appropriate initial decontamination. This is specific to each incident; such decontamination may include:
 - Removal of patients from **HOT** zone
 - Simple removal of clothing
 - Irrigation of eyes
 - Passage through high-volume water bath (e.g., between two fire apparatus) for patients contaminated with liquids or certain solids. Patients exposed to gases, vapors, and powders often will not require this step as it may unnecessarily delay treatment and/or increase dermal absorption of the agent(s).
- Initial triage of patients should occur after step #3. Immediate life threats should be addressed prior to technical decontamination.
- Assist patients with technical decontamination (unless contraindicated based on #3 above). This may include removal of all clothing and gentle cleansing with soap and water. All body areas should be thoroughly cleansed, although overly harsh scrubbing which could break the skin should be avoided.
- Place triage identification on each patient. Match triage information with each patient's personal belongings which were removed during technical decontamination. Preserve these personnel effects for law enforcement.
- Monitor all patients for environmental illness.
- Transport patients per local protocol.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill) Meconium Aspirator

Clinical Indications:

- Newborn with meconium-stained amniotic fluid.
- Infant showing signs of respiratory distress or poor muscle tone at birth.

Clinical Contraindications:

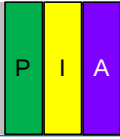
- Vigorous infants with strong respiratory effort, good muscle tone, and heart rate above 100 beats per minute, even if meconium is present.

Procedure:

1. Preparation by upon delivery, quickly assess the infant's vitality (heart rate, respiratory effort, muscle tone).
2. Position: If the infant is depressed, place them on a warm, dry surface under a radiant heat source.
3. Suction: Using a meconium aspirator attached to a suction device, gently insert the catheter into the trachea if the infant is not vigorous.
4. Aspiration: Apply suction while slowly withdrawing the catheter. Be cautious to monitor the infant's heart rate and oxygen saturation.
5. Repeat: If significant meconium is retrieved, the procedure may be repeated until the airway is clear of meconium.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Venous Access: Extremity

Clinical Indications:

- Any patient where intravenous access is indicated (significant trauma or mechanism, emergent or potentially emergent medical condition).

Procedure:

- Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the ALS professional.
- Paramedics and Intermediates can use intraosseous access where threat to life exists as provided for in the Venous Access-Intraosseous procedure.
- Use the largest catheter bore necessary based upon the patient's condition and size of veins.
- Fluid and setup choice is preferably:
 - Lactated Ringers with a macro drip for trauma or hypovolemia.
 - Normal Saline with a macro drip for medical conditions.
 - Normal Saline with a macro drip for medication infusions.
- Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
- Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
- Place a tourniquet around the patient's extremity to restrict venous flow only.
- Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
- Prep the skin with an antiseptic solution.
- Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
- Advance the catheter into the vein. **Never** re-insert the needle through the catheter. Dispose of the needle into the proper container without recapping.
- Draw blood samples when appropriate.
- Remove the tourniquet and connect the IV tubing or saline lock.
- Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.

Rates are preferably:

- Adult:** KVO: 60 mL/hr (1 gtt/ 6 sec for a macro drip set)
- Pediatric:** KVO: 30 mL/hr (1 gtt/ 12 sec for a macro drip set; 1 gtt/ 2 sec for micro)

If shock is present:

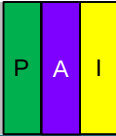
- Adult:** 500 mL fluid boluses repeated as long as lungs are dry and BP < 90 mmHg. Consider a second IV line.

- Pediatric:** 20 mL/kg boluses repeated PRN for poor perfusion.

- Cover the site with a sterile dressing and secure the IV and tubing.
- Label the IV with date and time, catheter gauge, and name/ID of the person starting the IV.
- Document the procedure, time and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Venous Access: Existing Catheters

Clinical Indications:

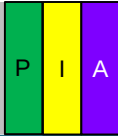
- Inability to obtain adequate peripheral access.
- Access of an existing venous catheter for medication or fluid administration.
- Central venous access in a patient in cardiac arrest.

Procedure:

1. Clean the port of the catheter with alcohol wipe.
2. Using sterile technique, withdraw 5-10 mL of blood and discard syringe in sharps container.
3. Using 5mL of normal saline, access the port with sterile technique and gently attempt to flush the saline.
4. If there is no resistance, no evidence of infiltration (e.g., no subcutaneous collection of fluid), and no pain experienced by the patient, then proceed to step 4. If there is resistance, evidence of infiltration, pain experienced by the patient, or any concern that the catheter may be clotted or dislodged, do not use the catheter.
5. Begin administration of medications or IV fluids slowly and observe for any signs of infiltration. If difficulties are encountered, stop the infusion and reassess.
6. Record procedure, any complications, and fluids/medications administered in the Patient Care Report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Venous Access: Intraosseous

Clinical Indications:

- Patients where rapid, regular IV access is unavailable with any of the following:
- Cardiac arrest.
- Multisystem trauma with severe hypovolemia.
- Severe dehydration with vascular collapse and/or loss of consciousness.
- Respiratory failure / Respiratory arrest.

Contraindications:

- Fracture proximal to proposed intraosseous site.
- History of Osteogenesis Imperfecta.
- Current or prior infection at proposed intraosseous site.
- Previous intraosseous insertion or joint replacement at the selected site.

Procedure:

1. Don personal protective equipment (gloves, eye protection, etc.).
2. Identify anteromedial aspect of the proximal tibia (bony prominence below the knee cap). The insertion location will be 1-2 cm (2 finger widths) below this. If this site is not suitable, and patient >12 years of age, identify the anteriomedial aspect of the distal tibia (2 cm proximal to the medial malleolus). **For distal femur in pediatrics and neonates, lace IO 2cm proximal to the patella, midline in the femur.**
3. Prep the site recommended by the device manufacturer with providone-iodine ointment/ solution, Chloro-Prep, or alcohol prep.
4. For manual pediatric devices, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, twist the needle handle with a rotating grinding motion applying controlled downward force until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further.
5. For the EZ-IO intraosseous device, hold the intraosseous needle at a 60 to 90 degree angle, aimed away from the nearby joint and epiphyseal plate, power the driver until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further.
6. Remove the stylette and place in an approved sharps container.
7. Infuse 2% Lidocaine immediately after IO insertion as follows:
Adult: 40 mg IO bolus slowly
Peds: 1 mg/kg IO bolus slowly, MAX 40 mg. *DO NOT EXCEED ADULT DOSE*
8. Attach a 10 mL NS syringe and inject at least 5 mL NS to clear the lumen of the needle.
9. Attach the IV line and adjust flow rate. A pressure bag may assist with achieving desired flows.
10. Stabilize and secure the needle with dressings and tape.
11. Following the administration of any IO medications, flush the IO line with 10 mL of IV fluid.
12. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System. Assessment should include direct observation at least once per certification cycle.



Standards Procedure (Skill)

Venous Access: External Jugular Access

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient ≥ 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.
- External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

1. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
2. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
3. Prep the site as per peripheral IV site.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
6. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
7. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
Advanced EMT's may perform the procedure, if the patient is in a critical state (i.e CPR/RSI/Crashing patient)

P

Standards Procedure (Skill)

Injectons: Subcutaneous and Intramuscular

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A

B

M

Clinical Indications:

- When medication administration is necessary and the medication must be given via the SQ (not auto-injector) or IM route or as an alternative route in selected medications.

Procedure:

- Receive and confirm medication order or perform according to standing orders.
 - Prepare equipment and medication expelling air from the syringe.
 - Explain the procedure to the patient and reconfirm patient allergies.
 - The most common site for subcutaneous injection is the arm.
 - Injection volume should not exceed 1 mL.
 - The possible injection sites for intramuscular injections include the arm, buttock and thigh.
 - Injection volume should not exceed 1 mL for the arm
 - Injection volume should not exceed 2 mL in the thigh or buttock.
 - The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 mL.
 - Expose the selected area and cleanse the injection site with alcohol.
 - Insert the needle into the skin with a smooth, steady motion
- SQ: 45-degree angle IM: 90-degree angle**
skin pinched skin flattened
- Aspirate for blood
 - Inject the medication.
 - Withdraw the needle quickly and dispose of properly without recapping.
 - Apply pressure to the site.
 - Monitor the patient for the desired therapeutic effects as well as any possible side effects.
 - Document the medication, dose, route, and time on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

P

Standards Procedure (Skill)

Intranasal Medication Administration

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Clinical Indications:

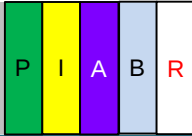
- Patient without IV access requiring urgent medication administration (e.g., active seizure, Narcotic OD).

Procedure:

1. Determine appropriate medication dose per applicable protocol.
2. Draw medication into syringe and carefully dispose of sharps.
3. Place mucosal atomizer on the end of the syringe and screw into place.
4. Gently insert the atomizer into the nare. Stop once resistance is met.
5. Rapidly administer the medication.
6. Document the results in the PCR.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.
- EMT-Basic and Advances are able to give Narcan IN, **no other medications**.



Standards Procedure (Skill)

Wound Care: Hemostatic Agent

Clinical Indications:

- Serious hemorrhage that can not be controlled by other means.

Contraindications:

- Wounds involving open thoracic or abdominal cavities.

Procedure:

1. Apply approved non-heat-generating hemostatic agent per manufacturer's instructions.
2. Supplement with direct pressure and standard hemorrhage control techniques.
3. Apply dressing.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Gastric Tube Insertion (NG/OG)

Clinical Indications:

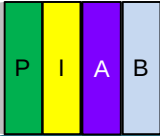
- Gastric decompression in intubated patients.

Procedure:

1. Estimate insertion length by superimposing the tube over the body from the tip of the nose around the ear lobe to the umbilicus.
2. Flex the neck **if not contraindicated** to facilitate esophageal passage.
3. Liberally lubricate the distal end of the tube and pass through the patient's nostril along the floor of the nasal passage. Do not orient the tip upward into the turbinates-this increases the difficulty of the insertion and may cause bleeding.
4. In the setting of an unconscious, intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred.
5. Continue to advance the tube gently until the appropriate distance is reached.
6. Confirm placement by injecting 20 mL of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.
7. Secure the tube.
8. Decompress the stomach of air and food either by connecting the tube to suction or manually aspirating with the large catheter tip syringe.
9. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Orthostatic Blood Pressure Measurement

Clinical Indications:

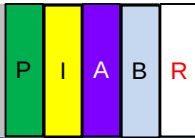
- Patient situations with suspected blood, fluid loss, or dehydration with no indication for spinal immobilization.
- Patients > 8 years of age, or patients larger than the Broselow-Luten tape.

Procedure:

1. Gather and prepare standard sphygmomanometer and stethoscope.
2. With the patient supine, obtain pulse and blood pressure.
3. Have the patient sit upright.
4. After 30 seconds, obtain blood pressure and pulse.
5. If the systolic blood pressure falls more than 30 mmHg or the pulse rises more than 20 bpm, the patient is considered to be orthostatic.
6. If a patient experiences dizziness upon sitting or is obviously dehydrated based on history or physical exam, formal orthostatic examination should be omitted and fluid resuscitation initiated.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Pulse Oximetry

Clinical Indications:

- Patients with suspected hypoxemia.

Procedure:

1. Apply probe to patient's finger or any other digit as recommended by the device manufacturer.
2. Allow machine to register saturation level.
3. Record time and initial saturation percent on room air if possible on/with the patient care report (PCR).
4. Verify pulse rate on machine with actual pulse of the patient.
5. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
6. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
7. In general, normal saturation is 97-99%. Below 94%, suspect a respiratory compromise.
8. Use the pulse oximetry as an added tool for patient evaluation. Treat the patient, not the data provided by the device.
9. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen despite good pulse oximetry readings, such as chest pain.
10. Factors which may reduce the reliability of the pulse oximetry reading include:
 - Poor peripheral circulation (blood volume, hypotension, hypothermia).
 - Excessive pulse oximeter sensor motion.
 - Fingernail polish (may be removed with acetone pad).
 - Carbon monoxide bound to hemoglobin.
 - Irregular heart rhythms (atrial fibrillation, SVT, etc.).
 - Jaundice.
 - Placement of BP cuff on same extremity as pulse ox probe.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Reperfusion Checklist

Clinical Indications:

Rapid evaluation of a patient with suspected acute stroke and/or acute myocardial infarction (STEMI) to:

- Determine eligibility and potential benefit from fibrinolysis.
- Rapid identification of patients who are not eligible for fibrinolysis and will require interventional therapy.

Procedure:

1. Follow the appropriate protocol for the patient's complaint to assess and identify an acute condition which could potentially benefit from fibrinolysis. If a positive finding is noted on one of the following assessments, proceed to step 2.

- Perform a 12 Lead EKG to identify an acute ST elevation myocardial infarction (STEMI).
- Perform the Cincinnati Pre-hospital Stroke Screen to identify an acute stroke.

2. Complete the Reperfusion Check Sheet to identify any potential contraindications to fibrinolysis. (See Appendix)

- Systolic Blood Pressure greater than 180 mm Hg.
- Diastolic Blood Pressure greater than 110 mm Hg.
- Right vs. Left Arm Systolic Blood Pressure difference of greater than 15 mm Hg
- History of structural Central Nervous System disease (tumors, masses, hemorrhage, etc.).
- Significant closed head or facial trauma within the previous 3 months
- Recent (within 6 weeks) major trauma, surgery (including laser eye surgery), gastrointestinal bleeding, or severe genital-urinary bleeding.
- Bleeding or clotting problem or on blood thinners.
- CPR performed greater than 10 minutes.
- Currently Pregnant.
- Serious Systemic Disease such as advanced/terminal cancer or severe liver or kidney failure.

3. Identify if the patient is currently in heart failure or cardiogenic shock. For these patients, a percutaneous coronary intervention is more effective.

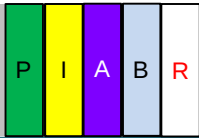
- Presence of pulmonary edema (rales greater than halfway up lung fields).
- Systemic hypoperfusion (cool and clammy).

4. If any contraindication is noted using the check list and an acute Stroke is suspected by exam or a STEMI is confirmed by EKG, activate the EMS Stroke Plan or EMS STEMI Plan for fibrinolytic ineligible patients. This may require the EMS Agency, an Air Medical Service, or a Specialty Care Transport Service to transport directly to a specialty center capable of interventional care within the therapeutic window of time.

5. Record all findings in the Patient Care Report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Restraints: Physical

Clinical Indications:

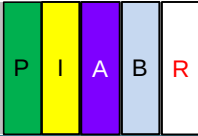
- Any patient who may harm himself, herself, or others may be gently restrained to prevent injury to the patient or crew. This restraint must be in a humane manner and used only as a last resort. Other means to prevent injury to the patient or crew must be attempted first. These efforts could include reality orientation, distraction techniques, or other less restrictive therapeutic means. Physical or chemical restraint should be a last resort technique.

Procedure:

- Attempt less restrictive means of managing the patient.
- Request law enforcement assistance and **Contact Medical Control**.
- Ensure that there are sufficient personnel available to physically restrain the patient safely.
- Restrain the patient in a lateral or supine position. No devices such as backboards, splints, or other devices will be on top of the patient. ***The patient will NEVER be restrained in the prone position.***
- The patient must be under constant observation by the EMS crew at all times. This includes direct visualization of the patient as well as cardiac and pulse oximetry monitoring.
- The extremities that are restrained will have a circulation check at least every 15 minutes. The first of these checks should occur as soon after placement of the restraints as possible. This **MUST** be documented on the PCR.
- Documentation on/with the patient care report (PCR) should include the reason for the use of restraints, the type of restraints used, and the time restraints were placed. Use of the Restraint Checklist is highly recommended.
- If the above actions are unsuccessful, or if the patient is resisting the restraints, consider administering medications per protocol. (Chemical restraint may be considered earlier.)
- If a patient is restrained by law enforcement personnel with handcuffs or other devices EMS personnel can not remove, a law enforcement officer **must** accompany the patient to the hospital in the transporting EMS vehicle.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Spinal Immobilization

Clinical Indications:

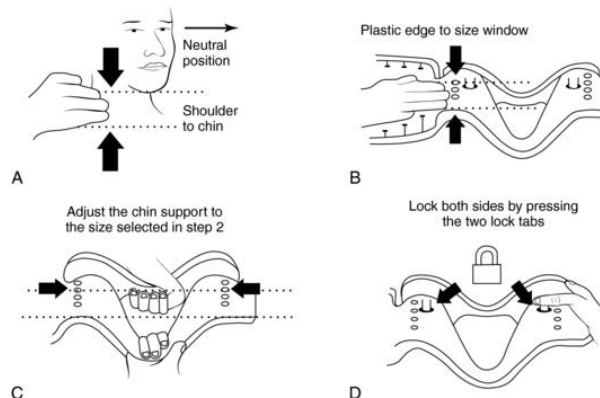
Need for spinal immobilization as determined by protocol.

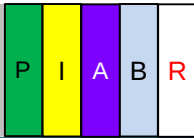
Procedure:

1. Gather a backboard or scoop stretcher; straps; C-collar appropriate for patient's size; tape; and head rolls or similar device to secure the head.
2. Explain the procedure to the patient.
3. Place the patient in an appropriately sized C-collar while maintaining in-line stabilization of the C-spine. This stabilization, to be provided by a second rescuer, should not involve traction or tension but rather simply maintaining the head in a neutral, midline position while the first rescuer applied the collar.
4. Once the collar is secure, the second rescuer should still maintain their position to ensure stabilization (the collar is helpful but will not do the job by itself).
5. Place the patient on a long spine board or scoop stretcher with the log-roll technique if the patient is supine or prone. For the patient in a vehicle or otherwise unable to be placed prone or supine, place them on a backboard or scoop stretcher by the safest method available that allows maintenance of in-line spinal stability.
6. Stabilize the patient with straps and head rolls/tape or other similar device. Once the head is secured to the backboard, the second rescuer may release manual in-line stabilization.
7. NOTE: Some patients, due to size or age, will not be able to be immobilized through in-line stabilization with standard backboards and C-collars. Never force a patient into a non-neutral position to immobilize them. Such situations may require a second rescuer to maintain manual stabilization throughout the transport to the hospital.
8. If transport time is greater than 20 minutes, the rescuer may elect to logroll the patient off the backboard or undo the scoop stretcher to allow the patient to rest on the cot. If performed, there must be an adequate number of rescuers to maintain in-line stabilization of the patient. Patient is to remain supine on the cot following for the duration of transport.
8. Document the time of the procedure in the patient care report (PCR).

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.





Standards Procedure (Skill)

Splinting

Clinical Indications:

- Immobilization of an extremity for transport, either due to suspected fracture, sprain, or injury.
- Immobilization of an extremity for transport to secure medically necessary devices such as intravenous catheters.

Procedure:

1. Assess and document pulses, sensation, and motor function prior to placement of the splint. If no pulses are present and a fracture is suspected, consider reduction of the fracture prior to placement of the splint.
2. Remove all clothing from the extremity.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess.
7. If a mid-shaft, closed femur fracture is suspected and there is no evidence of pelvic fracture or instability, the following procedure may be implemented for placement of a femoral traction splint:
 - Assess neurovascular function as in #1 above.
 - Place the ankle device over the ankle.
 - Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis
 - Extend the distal end of the splint at least 6 inches beyond the foot.
 - Attach the ankle device to the traction crank.
 - Twist until moderate resistance is met.
 - Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Patellar Reduction

Clinical Indications:

- Displacement of the patella from the trochlear groove, patient will present with severe pain, and a obvious deformed patella. Patient's may describe the knee as "giving away" or report hearing a pop or tear at the time of dislocation. The knee will typically be at a 20-30 degree of flexion and the patella is palpable laterally.

Procedure:

- Assess and document pulses, sensation, and motor function prior to reduction. Note the mechanism of injury. If no pulses are present and a fracture is suspected, consider contacting medical control and realigning the effected joint/extremity.
- Expose the extremity.
- Consider pain control and or sedation **before** reduction.
- Place patient in a supine position with hips flexed to relax the quadriceps and hamstrings muscles.
- Extend the knee while applying gentle and gradual pressure to the lateral aspect of the dislocated patella.
(Two Attempts Max)
- After reduction or unsuccessful attempts, place knee in splint or immobilizer.
- Document pulses, sensations and motor function.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

PICC Line Access

Clinical Indications:

- Patients with existing PICC lines requiring medications administration, blood draws, or fluid resuscitations.

Procedure:

1. Assure aseptic technique prior to access, clean lumen for at least 10 seconds.
2. Attach a 10mL flush, flush with approximately 1mL, then check the patency of the PICC line by aspirating the line with a syringe. If the line is patent, blood or fluid should withdraw into the line.
3. If the line is not patent, attempt to flush the line with at least 20mL of pulsating flushes watching for leaking or signs of infiltration. If the line remains non-patent after flushing, avoid using it and revert to normal IV/IO access.
4. Administer medications, draw blood, or provide fluid resuscitations as indicated, using appropriate technique, dosing, and procedure. **When using the PICC line for blood draws use a minimum of a 10mL syringe to avoid excess pressure and potential complications.**
5. Assure lines are clamped when not in use.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

P

Standards Procedure (Skill)

Wound Care: Taser® Probe Removal

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Clinical Indications:

- Patient with uncomplicated conducted electrical weapon (Taser®) probes embedded subcutaneously in non-sensitive areas of skin.
- Taser probes are barbed metal projectiles that may embed themselves up to 13 mm into the skin.

Contraindications:

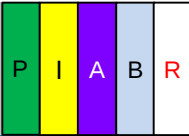
- Patients with conducted electrical weapon (Taser®) probe penetration in vulnerable areas of body as mentioned below should be transported for further evaluation and probe removal
- Probes embedded in skin above level of clavicles, female breasts, or genitalia
- Suspicion that probe might be embedded in bone, blood vessel, or other sensitive structure.

Procedure:

- Ensure wires are disconnected from weapon.
- Stabilize skin around probe using non-dominant hand.
- Grasp probe by metal body using dominant hand.
- Remove probe in single quick motion.
- Wipe wound with antiseptic wipe and apply dressing.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Temperature Measurement

Clinical Indications:

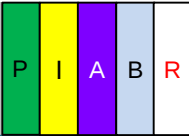
- Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation efforts.

Procedure:

- If clinically appropriate, allow the patient to reach equilibrium with the surrounding environment.
- For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (steps 3 to 5 below). For infants or adults that do not meet the criteria above, a rectal temperature is preferred (steps 6 to 8 below).
- To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient's tongue with appropriate sterile covering.
- Have the patient seal their mouth closed around thermometer.
- If using an electric thermometer, leave the device in place until there is indication an accurate temperature has been recorded (per the "beep" or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least 30 seconds (usually 2 to 3 minutes). Proceed to step 9.
- Prior to obtaining a rectal temperature, assess whether the patient has suffered any rectal trauma by history and/or brief examination as appropriate for patient's complaint.
- To obtain a rectal temperature, cover the thermometer with an appropriate sterile cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.
- Follow guidelines in step 5 above to obtain temperature.
- Record time, temperature, method (oral, rectal), and scale (C° or F°) in Patient Care Report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

Transport

Clinical Indications:

- To provide:
- Rapid emergency EMS transport when needed.
 Appropriate medical stabilization and treatment at the scene when necessary
 Protection of patients, EMS personnel, and citizens from undue risk when possible.

All individuals served by the EMS system will be evaluated, treated, and furnished transportation (if indicated) in the most timely and appropriate manner for each individual situation.

Procedure:

- All trauma patients with significant mechanism or history for multiple system trauma will be transported as soon as possible. The scene time should be 10 minutes or less.
- All acute Stroke and acute ST-Elevation Myocardial Infarction patients will be transported as soon as possible. The scene time should be 10 minutes or less for acute Stroke patients and 15 minutes or less (with 12 Lead ECG) for STEMI patients
- Other Medical patients will be transported in the most efficient manner possible considering the medical condition. Advanced life support therapy should be provided at the scene if it would positively impact patient care. Justification for scene times greater than 20 minutes should be documented.
- No patients will be transported in first responder non-transport vehicles.
- In unusual circumstances, transport vehicles other than ambulances may be appropriate when directed by Medical Control.
- EMERGENCY:** Lights and sirens. Speed no greater than 10 mph above posted speed limits.
Non-emergency: Obey posted speed limits.

****Show due regard for the public during ALL responses and transports.****

- Patient condition, Crew Leader, or Primary Care giver will determine if response to the hospital is **EMERGENCY** or **non-emergency**. Examples of **EMERGENCY** response back to the hospital would be:

- a. Cardiac or Respiratory Arrest.
- b. Airway Compromise.
- c. Time Critical Event: Acute MI or CVA.
- d. Trauma Activations: **Priority 1** or **Priority 2**.
- e. Status Epilepticus.
- f. Status Asthmaticus.
- g. Unstable Vital Signs.
- h. Imminent delivery or complicated pregnancy.
- i. Unconscious/Unresponsive Patient.
- j. Severe Respiratory Distress.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Vapotherm Oxygen Device

Clinical Indications:

- Patient's requiring high flow oxygen therapy and temperature management.
- Patient's with respiratory distress or failure, cardiovascular instability, or other life-threatening condition and non a pre-existing Vapotherm device, needing transported to another hospital/facility.

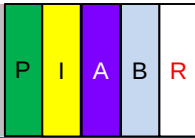
Procedure:

1. Assess and document the patient's vitals signs, including oxygen saturation and temperature of the Vapotherm device.
2. Attach the patient delivery tube to the water path, hang sterile water bag and allow 200ml of water to fill up the disposable circuit.
3. Connect the High Flow Vapotherm device to the oxygen and air source, and power source, ensuring that all connections are secure and properly attached.
4. Rotate the blue setting knob to turn on the display, and press in control knob to select the parameter and rotate to adjust the value.
5. Press and release the Run/Standby button once to start. (Green light = RUN mode) Allow the device to warm up to desired temperature.
6. Set the device to the appropriate flow rate and temperature settings, based on patients pre-existing settings, or patient's clinical indications/physicians orders.
7. Once the device is properly set up (Green light is becomes steady) place the cannula on the delivery tube and place on patient.
8. Monitor the patient's vitals signs and adjust the device's settings as needed to maintain optimal oxygenation.
9. Refer to the **Vapotherm Quick Reference Guide** for step by step instructions on starting up and adjusting the parameters on the Vapotherm.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Consider the patient's medical history, allergies and current medications when selecting the appropriate flow rate and temperature settings.



Standards Procedure (Skill)

Wound Care: Tourniquet

Clinical Indications:

- A tourniquet should be used to control life threatening hemorrhagic wounds to an extremity, only after other means of stopping blood loss have failed.
- Commercially made tourniquets are the preferred tourniquets to be used (ie. TacMed Solutions SOFTT and SOFTT-Wide, North American Rescue C-A-T, Cybertech MAT).
- Improvised tourniquets are not as effective, may cause more harm and are not preferred.

Contraindications:

- Non-extremity hemorrhage
- Proximal extremity location where tourniquet application is not practical

Precautions:

- A. Use BSI.
- B. A tourniquet applied incorrectly can increase blood loss and lead to death.
- C. Applying a tourniquet can lead to nerve and tissue damage whether applied correctly or not.
- D. Tissue damage is unlikely if the tourniquet is removed within 60-90 minutes.
- E. 6 hours of tourniquet application should be considered an upper limit under ideal circumstances.
- F. Austere environments may necessitate tourniquet use longer than 6 hours for patient survival.
- G. Tissue injury is acceptable over death secondary to hypovolemic shock.

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

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Standards Procedure (Skill)

Wound Care-Tourniquet

B

A

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Procedure:

A. Attempt to control hemorrhage using direct pressure, elevation and indirect pressure on pressure points prior to considering the application of a tourniquet.

B. If unable to control hemorrhage using the above means, apply a tourniquet using these steps:

i. Cut away any clothing so that the tourniquet will be clearly visible. The tourniquet should NEVER be obscured by clothing or bandages.

ii. Apply tourniquet proximal to the wound and not across any joints.

iii. Tighten tourniquet until bleeding stops.

a. Applying tourniquet loosely will only increase blood loss by inhibiting venous return.

iv. Mark the time and date of application on the patient's skin next to the tourniquet. Use a permanent marker.

v. If transport time **<30 minutes**, keep tourniquet on throughout prehospital transport.

vi. Tourniquet Reassessment:

(For transport time **>30 minutes**)

1. Patient exhibiting signs of circulatory shock?

YES Leave tourniquet in place.

NO Proceed to (2).

2. Patient has unstable clinical situation?

YES Leave tourniquet in place.

NO Proceed to (3).

3. Limited personnel/resources?

YES Leave tourniquet in place.

NO Proceed to **Tourniquet Removal**.

vii. Tourniquet Removal:

1. Amputated extremity?

YES Leave tourniquet in place.

NO Proceed to (2).

2. Apply pressure dressing, and loosen tourniquet (leaving tourniquet loosely in place). Proceed to (3).

3. Significant bleeding from site?

YES Re-tighten tourniquet until bleeding stops.

NO Proceed to (4).

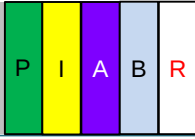
4. Further significant bleeding?

YES Re-tighten tourniquet until bleeding stops.

NO Proceed with transport and consult Medical Control.

viii. Document indications, tourniquet location, time of application, and patient response in PCR.

ix. Verbally communicate tourniquet location, time of application, and patient response to receiving facility staff.



Standards Procedure (Skill)

Wound Care-General

Clinical Indications:

- Protection and care for open wounds prior to and during transport.

Procedure:

1. Use personal protective equipment, including gloves, gown, and mask as indicated.
2. If active bleeding, elevate the affected area if possible and hold direct pressure. Do not rely on "compression" bandage to control bleeding. Direct pressure is much more effective.
3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
5. Monitor wounds and/or dressings throughout transport for bleeding.
6. Document the wound and assessment and care in the patient care report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Urinary Catheterization

Clinical Indications:

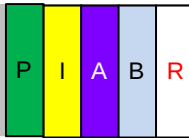
- Monitoring a patient's fluid status and/or response to therapy during transport.
- Collection of urine for laboratory analysis.
- Patients with medical (but NOT TRAUMA) complaints over the age of 16.

Procedure:

1. Explain the procedure to the patient. Maximize patient privacy. Have a second crewmember or other chaperone if performing the procedure on a member of the opposite sex.
2. If there is any question of traumatic injury in the Genitourinary (GU) region, do not perform this procedure.
3. Open the catheter kit. Test the balloon at the catheter tip. Connect the catheter to the urine collection system. Maintain the sterility of contents.
4. Use sterile gloves from the kit. Use one hand to come in contact with the patient and the other to use items from the kit. Recall that once your hand touches the patient, it is no longer sterile and cannot be used to obtain items from the kit.
5. Using the Betadine swabs from the kit, thoroughly cleanse the area surrounding the urethra. For males, this will require retracting the foreskin for uncircumcised males and cleansing of the glans for all males. For females, this will require retraction of the labia majora and cleansing of the area around the urethra.
6. Once the patient has been prepped with Betadine, place sterile sheet(s).
7. Lubricate the tip of the catheter.
8. Gently guide the catheter through the external opening of the urethra. Advance the catheter slowly until there is return of urine. Do not force the catheter through resistance. If resistance is encountered, withdraw the catheter slightly and gently re-direct the catheter.
9. Once urine is returned, gently inflate the balloon and secure the urine collection device.
10. Record procedure and amount of urine returned in the Patient Care Report (PCR).

Certification Requirements:

- Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.



Standards Procedure (Skill)

CardioPulmonary Resuscitation

(Lucas Operation)

LUCAS™2 Quick Reference Guide

Chest Compression System

NOTE: This guide is not a complete Instructions for Use. Refer to the "Instructions for Use" for complete directions for use, indications, contraindications, warnings, precautions, and potential adverse events.



ON/OFF



ADJUST



PAUSE

ACTIVE
continuousACTIVE
(30:2)

Confirm cardiac arrest and start manual CPR with a minimum of interruptions until LUCAS is applied and ready.



1 Activate (A)

- Push **ON/OFF** for 1 second to start self-test and power up LUCAS



2 Back Plate (B)

- Pause manual CPR
- Carefully put Back Plate under the patient, below armpits
- Resume manual CPR



3 Compressor (C)

- Pull release rings once; claw locks open. Then let go of the release rings
- Attach to Back Plate; listen for "click"
- Pull up once to ensure attachment



4 Position the Suction Cup

- Center the Suction Cup over the chest
- The lower edge of Suction Cup should be immediately above the end of the sternum

5 Push down the Suction Cup

- Push the Suction Cup down with two fingers (make sure it is in the **ADJUST** mode)
- Pressure pad inside Suction Cup should touch patient's chest. If the pad does not touch or fit properly, continue manual compressions
- Push **PAUSE** to lock Start Position – then remove your fingers from the Suction Cup



6 Start compressions

-
-
-



7 LUCAS Stabilization Strap

- Attach the LUCAS Stabilization Strap



Always follow local and/or international guidelines for CPR when you use LUCAS.

JOLIFE AB, Scheelevägen 17, SE-223 70 Lund, Sweden; Tel: +46 (0) 46 286 50 00, Fax: +46 (0) 46 286 50 10, E-mail: info@jolife.com, jolife.com
LUCAS is a trademark of JOLIFE AB. Specifications are subject to change without notice. CE 0434 © 2009 JOLIFE AB

Standards Procedure (Skill)

Ultrasound: Startup

Clinical Indications:

Procedure:

1. Turn the probe on by pressing the button on the side until the probe flashes blue.
2. Launch the VSCAN Air App on mobile device or iPad. If the app has previously been accessed, you may select the "Guest" option. While you are welcome to create your own account, please note that there are no additional benefits associated with account creation.
3. Next, you will be prompted to pair the probe. To activate the probe, press and hold the side button until the indicator turns blue. Release the button, and the probe will begin to flash white, indicating that it is in pairing mode. If the probe has been previously paired with the app, a prompt will appear after a short duration. Simply select "Join" to establish a connection between the app and the probe. If the probe has not been previously paired, please select "Add a New Probe", you will be directed to this page and follow the on-screen prompts.
4. The application features a primary scanning interface. To access the settings and presets, tap the top left corner of the screen. To review previous scans and records, as well as to share your captured images, press the top right corner of the screen. Touching the top left of the screen, will bring you to the settings and preset screen. You can change between presets to change your exam type.
5. On the settings page, we recommend implementing a couple of adjustments. First, please set the "Auto Freeze Time" to the maximum of 10 minutes; otherwise, the ultrasound will freeze or pause every minute. Additionally, we suggest enabling the "Centerline" feature to assist in initiating intravenous (IV) access.
6. On the primary scanning page, you can adjust the gain by sliding your finger left or right. Additionally, sliding your finger up and down on the screen allows you to modify the depth. It is important to note that changing the preset of the examination type will automatically adjust both the depth and gain to the optimal settings.
7. On the main scanning screen, can turn on and off "color mode". Color mode is added as a overlay on the image, depicting flow **towards** and **away** from the probe. A lighter shade of red or blue represents a higher velocity. No motion = grey.
8. Selecting the "snowflake" button, will freeze the screen. Here you can select the camera button or screenshot the page to then share the image(s).
9. Hold the probe so that the blue dot on the monitor is oriented to the same side as the raised orientation marker on the probe. This ensures the image on the screen corresponds to orientation of the probe as it is moved.
10. Use ultrasound gel to cover the tip of the Ultrasound probe and/or on the patient where the probe will be used. Inadequate gel may limit the view of the desired anatomy.

Standards Procedure (Skill)

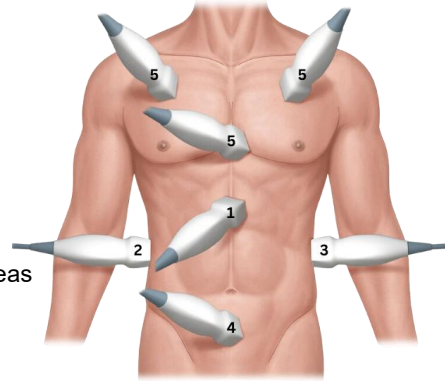
Ultrasound: E-F.A.S.T. Exam

Clinical Indications:

- Assessing a trauma patient for injuries, hypotension, and/or shock of unknown etiology in order to ascertain the necessity of interventions
- Assessment of shock or unexplained hypotension in a trauma-free patient

Procedure: Assure the patient is supine. Free fluid is jet black on the screen and tends to collect in the most dependent areas and surround the organs

1. Start with subxiphoid view with curvilinear probe
 2. Move to peri-hepatic view with curvilinear probe
 3. Move to peri-splenic view with curvilinear probe
 4. Move to suprapubic view with curvilinear probe
 5. Move to thoracic view(s) with linear probe
- Can be done in any order but it's important to assess all areas systematically



For visual references:

<https://www.acep.org/sonoguide/basic/fast>

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Ultrasound: E-F.A.S.T. Exam (Subxiphoid view)

Clinical Indications:

- Assessment of presence of blood in pericardium

Procedure: Start with Pericardial View: presence of hemopericardium is most easily observed from the subxiphoid position. Use the curvilinear probe

1. Position the probe transversely, or perpendicular to the spine, in the subcostal region just below the xiphoid process.
2. Tilt the probe hilt toward the patient's toes until it is almost parallel to the skin pointed towards the patient's head, just to the left of the sternum. This allows the probe to see under the ribs and look at the heart.
3. The probe orientation marker should be toward the patient's right side.
4. Begin panning the probe to the right until the edge of the liver comes into view on the monitor. This allows the liver to be used as an acoustic window through which the heart can be viewed
5. With the probe pointed between the patient's head and left shoulder, gently push down to facilitate looking under the ribs.
6. Move the probe as high into the subxiphoid space as possible
7. View the monitor and look for (from the top of the monitor to the bottom) the liver, the right ventricle then the left ventricle. The right ventricle will be next to the liver, both ventricles will be up and to the right, atria will be down and to the left
8. The image can be improved by either increasing the depth of the probe or having the patient take a deep breath. Either of these will increase the size of the heart as it is seen on the monitor.
9. Look for black space between the white lines of the pericardium, this indicates fluid in the pericardium.
10. Fluid in the pericardium can be confused with a pleural effusion. Identifying between the two can be done by viewing the heart in the parasternal long axis view. Pleural fluid will appear behind the aorta in this view.

* An epicardial fat pad can also be confused with fluid in the pericardium. Epicardial fat pads move with the heart as opposed to fluid in the pericardium which remain stationary.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

P

Standards Procedure (Skill)

Ultrasound: E-F.A.S.T. Exam (Parasternal Long-Axis View)

Clinical Indications:

- Assessment of presence of blood in pericardium

Procedure: To differentiate between a pleural effusion and pericardial effusion or if the heart can not be visualized with the Subxiphoid view

1. Place the probe just to the left of the sternum in the 4th or 5th intercostal space, directly over the center of the heart. with the transducer indicator toward the 4 o'clock position.
2. This view shows the anterior and the posterior pericardium. Sliding the probe toward the cardiac apex (toward the 4 o'clock position) provides a good look at the apex.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

P

Standards Procedure (Skill)

Ultrasound: E-F.A.S.T. Exam (Peri-hepatic view: right upper quadrant)**Clinical Indications:**

- Assessment of presence of free fluid in the intraperitoneal space.

Procedure: Move to peri-hepatic View:

1. Position the probe in the 8th to 11th intercostal space slightly anterior to the midaxillary line on the patient's right side. The probe marker should be pointing towards the patient's head, probe still aligned in the midaxillary space.
2. Identify the **lung, liver, Morison's Pouch, diaphragm**, and the long-axis of the **right kidney**.
 - If the liver is not visible, move the probe distal to the next intercostal space until both liver and kidney are visible.
 - If only the kidney is visible, move the probe proximal to the next intercostal space until they are both visible. If the probe is too anterior, it will be difficult or impossible to view the kidney. Moving the probe toward the axillary can help.
1. Look for the space between the liver and kidney (Morrison's pouch).
 - Free fluid may also be seen along the lower edge of the liver and around the lower tip of the liver. Move the probe along the entire length of the liver/kidney junction looking for fluid.
 - Shadows from the ribs can be minimized by rotating the probe slightly counter-clockwise so the probe is more parallel to the rib

Hemothorax: This view can also be used to look for a hemothorax if time allows

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

P

Standards Procedure (Skill)

Ultrasound: E-F.A.S.T. Exam (Peri-splenic view: left upper quadrant)

Clinical Indications:

- Assessment of presence of free fluid in the intraperitoneal space.

Procedure: Move to peri-splenic View:

1. Position the probe in the 8th to 11th intercostal space with the probe marker pointed towards the patient's head. The left kidney is located slightly more posterior and superior than the right so place the probe slightly posterior to the midaxillary line on the patient's left side slightly higher than where the kidney was found on the right. To eliminate rib shadows, rotate the probe and look between ribs.
2. Move the probe until you will see a mirror image of the right side with the spleen at the top of the monitor, the diaphragm to the left, and the kidney to the right.
3. Fluid will most likely accumulate in the perisplenic space (between the spleen and the diaphragm) as opposed to between the spleen and the kidney.
4. The structures which are seen in this assessment move as the diaphragm contracts and relaxes during the respiratory cycle. Consider asking your patient to hold their breath to keep the desired organs from moving. Also, consider slightly rotating the probe clockwise towards the bed, so that the probe fits better between the rib spaces or moving it along the rib space in order to identify all aspects of the spleen.
5. Anteriorly the stomach can cause air artifact and make visualization challenging so moving the probe posteriorly may be helpful.

Certification Requirements:

Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by the local EMS System.

Standards Procedure (Skill)

Ultrasound: E-F.A.S.T. Exam (Suprapubic view)

Clinical Indications:

- Assessment of presence of free fluid in the intraperitoneal space.

Procedure: Move to Suprapubic View:

1. Place the transducer just superior to the pubic symphysis with a transverse view (perpendicular to the spine) with the probe marker to the right.
2. Tilt the probe down into the pelvis so the probe points toward the pelvic cavity and keep it in the midline. Proper probe position can be conformed by actually placing the probe on the pubic bone and noting a bone shadow on the image then sliding the probe slightly superior.
3. A full bladder will be triangular in shape. The lower angle of the bladder marks the border between the intraperitoneal space (left side of the image) and the true pelvic structures (right side of the image). In males, identify the **bladder** (*immediately posterior to the symphysis when the probe marker is pointing towards the head*), **prostate/seminal vesicle**, and **rectovesical pouch** in the longitudinal view. The rectovesical pouch is where free fluid will accumulate in the male pelvis. In Females, identify the **bladder**, **uterus**, and **Rectouterine Pouch** (also called the *Pouch of Douglas*). The Pouch of Douglas is where free fluid will accumulate in the female pelvis. Free fluid may also be seen completely surrounding the edges of the uterus. If there is clot in the pelvis, this will look grey compared with unclotted blood which will be black.
4. Sweep the entire bladder by fanning the probe or moving it in an arc across the bladder to identify free fluid. The bladder can also be swept both in the transvers view from left to right and in the longitudinal view from top to bottom in order to find free fluid. Rocking the probe slowly from side to side will increase the sensitivity of the examination.

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Standards Procedure (Skill)

Ultrasound: E-F.A.S.T. Exam (Thoracic view)

Clinical Indications:

- Assessment of presence of free air in the thoracic cavity.

Procedure: Move to thoracic view:

1. Probe should be set to linear. Assure the depth is set between 3-6 cm depending on the amount of tissue between the probe and the thoracic cavity.
2. Hold the probe perpendicular to the ribs with the probe orientation marker pointing towards the head. Start around the 3rd or 4th intercostal space in the midclavicular line.
3. Anchor the probe to the space between two ribs. The ribs will cast a shadow which will create the "batwing sign". Look for the batwing sign to confirm correct placement of the probe. Hold the probe very still in order to properly see movement in the chest cavity.
4. Next look for the pleural line (white) between the ribs.
5. Look for lung sliding and/or comet tails. Absence of these could indicate the presence of a pneumothorax.
 - Lung sliding will appear as shimmering, grainy mixed echogenicity below the pleural line. It is sometimes referred to as "ants on a log". Lung sliding will be better visualized if the ultrasound beam is angled medially to be perpendicular to the true thoracic cavity (and not the skin) in cases of significant obesity.
 - Comet tails appear as projections down from the pleural line, moving vertically
6. Switching to M-mode if available to look for lung sliding may be helpful. In M-mode, the granular appearance below the pleural line appears as sand on the beach and is called the "seashore sign." If a pneumothorax is present instead of a seashore sign, a barcode sign will be seen.
7. Comparing one side of the chest to the other may be helpful. Additional images should be obtained.

Certification Requirements:

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Standards Procedure (Skill)

Ultrasound: IV Access

Clinical Indications:

Procedure:

- 1. Preparation:
 - Ensure the ultrasound machine is charged and functioning properly.
 - Gather necessary supplies including IV catheter, sterile drapes, gloves, ultrasound gel, and alcohol swabs.
 - Position the patient comfortably with the limb (arm or hand) exposed and easily accessible.
- 2. Ultrasound Setup:
 - Power on the handheld GE ultrasound machine and select the appropriate preset for vascular access or IV placement.
 - Apply a generous amount of ultrasound gel to the skin over the intended insertion site to provide acoustic coupling.
- 3. Ultrasound Probe Placement:
 - Hold the ultrasound probe perpendicular to the skin and gently place it over the vein of interest.
 - Adjust the depth and focus settings to visualize the vein clearly on the ultrasound screen.
- 4. Locating the Vein:
 - Scan along the vein to identify the optimal entry point and trajectory for the IV catheter.
 - Confirm vein patency by compressing the vein and observing for venous collapse and refill.
- 5. Guided Insertion:
 - Once the IV catheter needle tip is visualized entering the vein on the ultrasound screen, maintain a steady hand to guide the needle accurately.
 - Slowly advance the needle into the vein while monitoring the needle tip position in real-time on the ultrasound screen.
 - Use a controlled, gentle technique to minimize patient discomfort and reduce the risk of complications such as inadvertent arterial puncture.
 - As you advance the IV catheter, ensure that the tip remains within the lumen of the vein and does not penetrate through the opposite wall.
 - If encountering difficulty in visualizing the needle tip or maintaining proper alignment, adjust the angle and depth of the needle insertion while continuously monitoring on the ultrasound screen.
 - Consider using a dynamic approach, gently moving the needle in and out while observing the real-time ultrasound image to optimize catheter placement.
 - Once the catheter is successfully advanced into the vein, confirm proper positioning by observing blood return in the catheter hub and visualizing the catheter tip within the vein on ultrasound.
 - Secure the catheter in place using the provided stabilization device or securement technique, ensuring it is well-fixed to prevent dislodgement during patient movement or transport.
 - Complete the IV catheter insertion by connecting the catheter hub to IV tubing, securing the connection, and initiating fluid or medication administration as needed.

Standards Procedure (Skill)

Ultrasound: IV Access

Clinical Indications:**Procedure:**

- 6. Advancing the Catheter:
 - Once the needle is in the vein, advance the catheter while watching the ultrasound screen to ensure proper placement and avoid complications like infiltration.
- 7. Securing the IV Catheter:
 - Once the catheter is successfully placed, secure it in position with sterile dressings and securement devices.
 - Confirm proper placement and functionality by aspirating blood and flushing the catheter with saline.
- 8. Cleaning and Maintenance:
 - Turn off the ultrasound machine, clean the probe with disinfectant wipes, and store it properly for future use.
 - Dispose of any used supplies appropriately and ensure proper disposal of biohazardous materials.

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Standards Procedure (Skill)

Ultrasound: Cardiac Activity

Clinical Indications:

- Using the POCUS device as a way to confirm cardiac activity to meet criteria of death, or as a tool in cardiac arrest patients. It may be used to differentiate between PEA and True Cardiac Motion or Fine V-Fib vs Asystole

Procedure:

Depending on which cardiac view you are using, the anatomy of the heart may look different. We will be using the Subxiphoid view and the Parasternal Long Axis view. The Parasternal Long Axis View is often abbreviated as PSLA or PLAX. It is usually the first cardiac ultrasound view obtained and will give you an immediate assessment of the general condition of the heart. The Subxiphoid view is useful when you are having difficulty getting adequate parasternal views (i.e. COPD patients) or when you are evaluating a trauma patient when doing the eFAST scan.

Parasternal Long Axis View (PSLA):

- Point the probe indicator toward the patient's right shoulder
- Place the probe at the 4th intercostal space which is approximately the nipple line for males or the inframammary fold to the sternum (females).
- Optimize the gain to visualize the different chambers of the heart in view
- Optimize the depth to make sure you can see the Descending Aorta.
- If you are having trouble orienting yourself, just remember "the 3 L's": For the Parasternal Long Axis view, the Left Ventricle is on the Left side of the screen.

Subxiphoid View:

- With the patient's knees bent, position the probe under the costal arch (beneath the xiphoid process) with the indicator pointing towards the patient's left.
- Since the plane of the heart is superficial, you need to use an overhand grip on the probe in order to be parallel with the skin
- Make sure to use the Liver as an acoustic window! (It will be at the top of the ultrasound screen/scan)
- If you approach from the left side your view will be obstructed by the stomach or bowel gas.
- If you are still having trouble getting a clear image, try applying gentle downward pressure on the probe.