



# **Greenville County Emergency Medical Services**

## **Clinical Operating Guidelines**



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# 2024 Greenville County EMS, Clinical operating Guidelines

## Introduction

This document describes the methods by which the Greenville County EMS system will continue to provide exceptional pre-hospital care. Evidenced – based guidelines, proven practices, and years of experience have been incorporated into this document to provide a solid foundation for the treatment of the vast majority of patients encountered. Medical Control can be contacted for those patients who do not fall into a stated protocol or if deviation from the stated protocol is required to best treat the patient. Providers must utilize good clinical judgment when interpreting these protocols and always act in the best interest of the patient. While appropriate and clinically sound care is imperative, it must also be delivered compassionately and empathetically.

**DHEC Licensed Rapid Responder Agencies in Greenville County who utilize Dr. Marty Lutz for Medical Control Physician are authorized to use these Clinical Guidelines to the level of their agency's license.**

**Patient Definition:** A patient is defined as any person who meets any of the following criteria:

- Receives basic or advanced medical/trauma treatment
- Is physically examined
- Has visible signs of injury or illness or has a medical complaint
- Requires EMS assistance to change locations and/or position
- Identified by anyone as a possible patient because of some known, or reasonably suspected illness or injury
- Has a personal medical device evaluated or manipulated by EMS
- Requests EMS assistance with the administration of personal medications or treatments

### **ALS/BLS Continuity of Care Criteria:**

- If a medication has been administered by a non-EMS healthcare provider outside the BLS scope of practice within the past hour, an ALS provider must continue patient care.
- If the medication administered is part of the patient's regular medication regimen, prescribed to them, BLS providers are permitted to maintain care and monitor the patient, provided no additional advanced interventions are required.
- If another ALS agency has assumed patient care and performed interventions outside the scope of practice of an EMT, this agency must continue patient care or transfer care to a paramedic provider.



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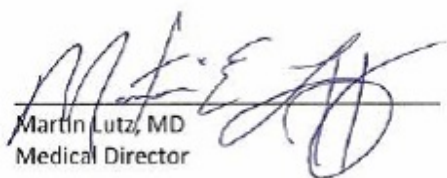
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**Pediatric Guidelines:** The protocols are divided into Adult and Pediatric sections, as well as cardiovascular, general medical, trauma, and other special groupings. For pediatric patients, the appropriate pediatric-specific protocol should be utilized if one exists. If there is not a pediatric-specific protocol for a given pediatric patient situation, utilize the adult protocol, but always use pediatric weight-based dosing for medications. Never exceed adult doses of medication for a pediatric patient.

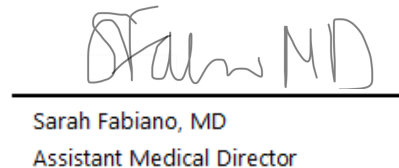
**Refusals:** Patients who are mentally capable of making decisions are able to refuse medical care, even if the consequences of the refusal of care may be potentially harmful or even deadly. The EMS employee shall ensure that the patient understands the contents of the waiver and is aware of the potential consequences of refusing medical treatment or transport. If at all possible, the patient should be advised of said consequences in front of a witness. Any nonemancipated minor who is 16 years of age or older has the right to refuse treatment and transportation, we should attempt to obtain parental consent for these patients if at all possible. A minor who is married, pregnant (or has been pregnant), or independently living away from home may refuse treatment and/or transport. Refusals of care and/or transport should be well documented in the patient care report (PCR).

**Health Care Power of Attorneys:** Patients who have a Health Care Power of Attorney retain the right to make healthcare decisions as long as they are mentally capable of doing so. No treatment can be provided or withdrawn against the patient's will unless they become mentally incapable of making decisions.

**Surgical Airways:** While surgical airways are an approved South Carolina Paramedic level skill, at no time shall a Paramedic attempt a surgical airway, even with on-line medical direction, with the exception of those specifically appointed to perform the skill by the Medical Director.



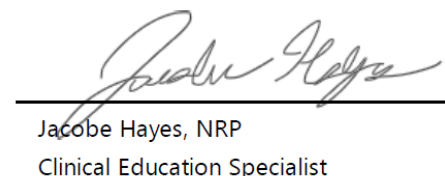
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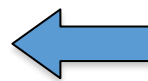
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## LEGEND

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic
M	Medical Control
SO	Special Operations
RSI-P	RSI Authorized Paramedic
CCP	Critical Care Paramedic



Indicates the lowest  
level certification that  
can perform This task.

# Standard Policies

## Air Transport

1.1

### Policy:

- Air transport should be utilized whenever patient care can be improved by decreasing transport time or by giving advanced care not available from ground EMS services, but available from air medical transport services (i.e., blood).

### Purpose:

- Improve patient care in the prehospital setting.
- Allow for expedient transport in serious, mass casualty settings.
- Provide life-saving treatment such as blood transfusion.
- Provide more timely access to interventional care in acute stroke and ST-elevation myocardial infarction.

### Procedure:

1. Patient transportation via ground ambulance will not be delayed to wait for helicopter transportation. If the patient is packaged and ready for transport and the helicopter is not on the ground, or within a reasonable distance, the transportation will be initiated by ground ambulance.
2. Air transport should be considered if any of the following criteria apply:
  - a. High priority patient with greater than 20 minute transport time
  - b. Entrapped patients with greater than 10 minute estimated extrication time
  - c. Multiple casualty incident with red/yellow tag patients
  - d. Multi-trauma or medical patient requiring life-saving treatment not available in the prehospital environment (i.e., blood transfusion, invasive procedure, operative intervention)
  - e. Time dependent medical conditions such as acute STEMI or acute stroke that could benefit from the resources at a specialty center.
3. If a potential need for air transport is anticipated, but not yet confirmed, an air medical transport service can be placed on standby.
4. If the scene conditions or patient situation improves after activation of the air medical transport service and air transport is determined not to be necessary, Paramedic or administrative personnel should cancel the request by communicating face-to-face with the on-scene Fire Department Incident Commander.
5. Minimal Information which should be provided to the air medical transport service include:
  - Number of patients
  - Age of patients
  - Sex of patients
  - Mechanism of injury or complaint (MVC, fall, etc.)

# Burn Unit Referral Criteria

**Policy:**

- A burn unit may treat adults, children or both.

**Purpose:**

- To identify burn injuries that should be referred to a burn unit.

**Procedure:**

1. Refer all burns to a burn unit which include the following:
  - a. Partial thickness burns greater than 10% total body surface area (TBSA).
  - b. Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
  - c. Third-degree burns in any age group.
  - d. Electrical burns, including lightning injury.
  - e. Chemical burns.
  - f. Inhalation injury.
  - g. Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality.
  - h. Any patients with burns and concomitant trauma (such as fractures), the trauma poses the greater immediate risk. The patient must be initially stabilized in a trauma center before being transferred to a burn unit. Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.
  - i. Burned children in hospitals without qualified personnel or equipment for the care of children.
  - j. Burn injury in patients who will require special social, emotional, or long-term rehabilitative intervention.

*Excerpted from Guidelines for the Operations of Burn Units (pp. 55-62),  
Resources for Optimal Care of the Injured Patient: 1999, Committee on Trauma, American College of Surgeons.*

# Child/Elderly Abuse Recognition and Reporting

## Policy:

- **Child abuse** includes physical and mental injury, sexual abuse, inadequate supervision, negligent treatment, and/or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare.
- **Elderly abuse** includes physical, emotional, sexual, and financial abuse, negligent treatment, and/or maltreatment.
- A **Vulnerable adult** is anyone aged 18 and over with a condition that significantly limits their ability to perform their own activities of daily living. This condition may be mental, physical, or cognitive. It also includes adults who cannot provide their own protection.

The recognition of abuse and proper reporting by EMS is a critical step to improving the safety of children and preventing child/elderly abuse. EMS providers have the ability to assess the home environment, the interaction of the patient with all those living in the home. They serve as a critical bridge of information to in-hospital providers.

## Purpose:

- Assessment of child/elderly abuse is based upon the following principles:
  - **Protect** the life of the child from harm, and the EMS team from liability.
  - **Suspect** that the child/elderly patient may be a victim of abuse, if the injury/illness is not consistent with the reported history.
  - **Respect** the privacy of the child and family.
  - **Collect** as much evidence as possible, especially information.

## Procedure:

1. Documentation is critical. Reports should be detailed and objective. Include quotations and any conflicting stories. Include a complete physical exam, description of the home environment.
2. Assess for and extensively document physical signs of abuse, particularly, any injuries that are inconsistent with the reported mechanism of injury.
3. Assess for and document signs and symptoms of neglect, including inappropriate level of clothing for the weather, inadequate hygiene, absence of attentive caregiver(s), or physical signs of malnutrition.
4. Assess for and document psychological characteristics of abuse - excessive passivity, compliant or fearful behavior, excessive aggression, violent tendencies, excessive crying, fussy behavior, hyperactivity, or other behavioral disorders.
5. EMS providers are considered mandatory reporters of suspected child, vulnerable adult, and elderly abuse. **South Carolina law requires the EMS provider to immediately report any suspicious findings to both the receiving hospital and to the South Carolina DSS reporting hotline phone number at 1-888-CARE-4-US (1-888-227-3487).** The report should be completed on a recorded line, and documented on the patient care report (PCR). There are legal protections for reporters, but potential legal ramifications for those who do not.
6. While law enforcement may also be notified, EMS should not accuse or challenge the suspected abuser. In the event of a child fatality, law enforcement must also be notified. Consider the involvement of a supervisor or law enforcement early if caregivers refuse hospital transport.

# Criteria for Death/Withholding Resuscitation

**Policy:**

- CPR and ALS treatment are to be withheld only if the patient is obviously dead or a valid South Carolina **Do Not Resuscitate** form is present (see **DNR Protocol**).

**Purpose:**

- To honor those who have obviously died prior to EMS arrival.

**BLS Providers (EMS or Fire)**

- If a patient is in complete cardiopulmonary arrest (clinically dead) and meets one or more of the criteria below, CPR need not be initiated:
  - Valid DNR (refer to policy 1.5.)
  - Body decomposition.
  - Rigor mortis.
  - 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).
- If a bystander or first responder has initiated CPR or automated defibrillation prior to BLS arrival and any of the above criteria (signs of obvious death) are present, the BLS provider may discontinue CPR.

**ALS Providers (EMS or Fire)**

- In addition to the above criteria, CPR and ALS therapy need not be initiated if the following are present:
  - Traumatic arrest in asystole or PEA <30..
  - Extended downtime (20 or more minutes of no CPR) or un-witnessed arrest with asystole on the EKG in two leads.
- If a bystander, first responder, or BLS provider has initiated CPR or automated defibrillation prior to ALS arrival and any of the above criteria (signs of obvious death) are present, the ALS provider should discontinue CPR.

**PEARLS:**

1. 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**.
  - b) Patient care responsibilities are transferred to the destination hospital staff.
  - c) Orders to terminate resuscitation are received by Medical Control.



# DNR, POST, and Advanced Directives

## Policy:

Any patient presenting to any component of the EMS system with a completed and properly formatted South Carolina Do Not Resuscitate (DNR) form, and or an approved South Carolina “Do Not Resuscitate” bracelet in place shall have the order honored. Treatment will be limited as documented in the palliative care section of the SC Code of Laws Section 44-78-10 amended 1994. A living will or other legal document that identifies the patient’s desire to withhold CPR or other medical care may not be honored other than the POST form. If the patient has a Do Not Resuscitate bracelet, it must be from the official vendor “Sticky J Medical ID Company” which is pictured below.

## Purpose:

- To honor the terminal wishes of a patient preventing the initiation of unwanted resuscitation in accordance with South Carolina law under the Death with Dignity Act.



## Procedure:

- When confronted with a cardiac arrest patient, the following conditions must be present and confirmed in order to honor the DNR request and withhold CPR and ALS therapy:
  - The form(s) must be a South Carolina DNR form, “DNR” box is checked in section A of the POST form, or an approved South Carolina DNR Bracelet must be present on the patient.
  - The effective date and all required information provided
  - Must be signed or approved by a SC licensed physician

**A valid DNR form may ONLY be revoked by VERBAL/IMPLIED request, by mutilating, obliterating or destroying the document, or by removal or destruction of an approved bracelet in any manner by the PATIENT ONLY.**

- If the patient or anyone associated with the patient requests that a SC DNR form not be honored, EMS personnel should contact their Supervisor/Medical Control to obtain assistance.
- When confronted with a seriously ill patient who is not in cardiac arrest and has a POST form, the POST form Section B shall be utilized as follows:
  - Full Treatment box is checked: Use all appropriate measures included in Greenville County EMS system protocols to stabilize/resuscitate the patient.
  - Limited Treatment box is checked: The maximum airway intervention is non-rebreather mask and airway suctioning. All appropriate IV medications may be utilized. No electrical therapies are to be provided.
  - Comfort Measures box is checked: The maximum airway intervention is non-rebreather mask and airway suctioning. IV pain medications may be administered. Medical Control may be contacted to reference appropriate treatment.
- Living wills or other documents indicating the patient’s desire to withhold CPR or other medical care may not be honored by SC paramedics
- EMS providers can accept a copy of an original DNR form valid for that transport only after visually verifying that the properly formatted, completed SC DNR exists, and documenting that on the copy of the form.
- The copy or original form should be scanned and attached to the ePCR if executed.
- Any SC DNR form that is transported with the patient and is NOT executed **must be returned to the patient or patient surrogate agent (POA).**
- If specific parameters of this policy are not met or there is doubt, contact Medical Control for questions and clarity.**

### Resuscitative Measures to be withheld:

- CPR
- Advanced airway management to include intubation
- Defibrillation
- Cardiac resuscitation medications (**Atropine, Epinephrine**)

### Approved procedures include:

- Assist Ventilation
- Suction
- Basic Cardiac monitoring
- Oxygen and basic airway (OPA, NPA)
- CPAP
- Control of bleeding
- Comfort care
- Pain Management

### Non-cardiac resuscitation medications:

Aspirin, Nitroglycerin, Adenosine, Diltiazem and Amiodarone (for wide complex tachardia with a pulse).

# Discontinuation of Prehospital Resuscitation

**Policy:**

- Unsuccessful resuscitative efforts may be discontinued prior to transport or arrival at the hospital when the criteria detailed below is met.

**Purpose:**

- To allow for discontinuation of pre-hospital resuscitation efforts in patients in cardiac arrest.

**Procedure:**

1. Discontinuation of CPR and ALS intervention for non-traumatic cardiac arrest patient may be implemented without Online Medical Control authorization in the following patients:
2. Patient is 18 years of age or older.
3. High quality CPR has been performed.
4. Airway management with confirmed effective ventilations. Acceptable airway management techniques include blind insertion airway device (IGEL or King LT), orotracheal intubation, nasotracheal intubation.
5. Waveform Capnography has been initiated, observed, and trended throughout management of arrest.
6. IV or IO access achieved with rhythm appropriate medications administered.
7. All providers involved in the patient's care agree that discontinuation is appropriate.

**Contraindications:**

1. An EMS witnessed arrest.
2. Return of Spontaneous Circulation (ROSC) or presumed ROSC at any point in care.
3. CPR induced consciousness at any point in care.
4. Abrupt rise in EtCO<sub>2</sub>  $\geq$  10mmHg  $\pm$  pulses.
5. Hypothermic patients.
6. Pregnancy.
7. Resuscitation attempted within public view.

**Rhythm:**

- Persistent VF/VT (after 3 or more defibrillations)
  - Do not perform Termination of Resuscitation, initiate transport.
- Asystole or PEA
  - If EtCO<sub>2</sub> < 10mmHg, consider termination after 20 minutes.
  - If EtCO<sub>2</sub>  $\geq$  10mmHg, consider termination of resuscitation after 30 minutes.
  - Times begin when chest compressions are started by a credentialed fire or EMS provider.

**PEARLS:**

- Consider differential diagnosis of arrest and potential benefit of ED intervention, particularly in younger otherwise healthy patients.
- If resuscitation is performed in a public setting or one felt to be inappropriate to terminate, work the arrest until the patient can be transferred to ambulance. Continue resuscitative efforts enroute to nearest appropriate emergency department. Consider contacting online medical control for field termination orders if appropriate.
- **Traumatic arrests can be terminated on-scene without contacting Medical Control if at any point the patient presents with asystole or a wide complex PEA less than 30.**
- Refer to **Death Communication** with Family Policy early in resuscitative process.
- Refer to **Deceased Persons** policy following termination or resuscitation.

# Death Communication with Family

**Policy:**

- To aid in the notification and grieving process for family and friends after the immediate death of a loved one.

**Purpose:**

1. Death notification can be very complex and will have lasting impact on family and friends. Understanding the basics of human emotion and the normal reactions to traumatic events can help guide a proper notification.
2. Everyone reacts differently to death notifications; some will appear catatonic with little to no outward emotion while others will become angry and irrational.
3. The five basic stages of grief are:
  1. Denial and isolation
  2. Anger
  3. Bargaining
  4. Depression
  5. Acceptance
4. In the pre-hospital environment, it is likely that family will express all five stages of grief rapidly and while EMS is on-scene.
5. Each individual processes a death notification in their own unique manner. Be patient and courteous and allow the family member to find peace in their own way.

**Procedure:**

1. Delivery matters:
  - a. Introduce yourself by name and get on eye level with the family member.
  - b. Confirm the identity and relationship of the family member.
  - c. Use a very simple one line sentence to break the news, "I am very sorry to tell you but (use the victim's name) has died. Do not use "passed", "expired", or "moved on". Also, refrain from referring to the body as a victim, patient, son, etc.
  - d. Immediately inform the family member that they will be helped through the entire process.
  - e. Pause and allow the family member time to process the information and ask questions.
  - f. Demonstrate empathy and understanding.
  - g. Ask if other family members or friends should be notified.
2. Statements to avoid:
  - a. I know how you feel.
  - b. You need to be strong.
  - c. Calm down.
  - d. God must have needed him/her more than you.
  - e. Now that you know, I need to know what funeral home you would like.
  - f. It could have been worse.
3. Helpful Statements:
  - a. I am sorry.
  - b. This is harder than most people think.
  - c. Is there anyone I can contact for you?
  - d. I wish I could give you an answer that could help, but I just cannot.
  - e. I can only imagine how you must feel.
4. Listen; allow the family to speak and grieve. Many times they just want to be heard.

# Standard Policies

## Deceased Person

1.8

### Policy:

- Facilitate the appropriate transition of a deceased person to the care of the coroner or funeral home.

### Purpose:

- Operate under the laws and regulations of the State of South Carolina
- Distinguish the roles of ALS vs BLS crews in completing this process
- Delineate the difference in procedure between natural, unnatural, and questionable deaths.

### Definitions:

- Natural death scenes: scenes where there is reasonable evidence that the person died of natural causes.
- Unnatural or questionable death scenes: scenes outside the definition of a natural death (violence, trauma, drugs, hemorrhage, fetal death, pediatrics, questionable or insufficient information to identify cause of death. Patient's under the age of 60 without extensive medical history.
- High morbidity cases: cases in which the EMS personnel believe that patient death may be imminent as a result of unnatural causes.

### Procedure:

1. Patient determined to be deceased on scene by ALS or BLS crews based on appropriate criteria in policies 1.4, 1.5, and 1.6.
2. In the event of a natural death scene,
  - a. Evaluates patient and declares death and no resuscitation attempted, or resuscitation ceased if initiated.
  - b. Record time of declaration.
  - c. Collects and record information on primary care physician (if applicable), funeral home and reports pertinent information to coroner on call. EMS clears the scene after contacting the coroner and providing brief family care as needed. Coroner will contact the primary care physician and funeral home.
3. In the event of an unnatural questionable, or traumatic death scene, contact the coroner and law enforcement.
  - a. Leave the immediate area without disturbing anything related to the scene.
  - b. Do not move or reposition the body. Leave in place any disposable medical equipment used to assess the patient. Use caution when moving around the patient, surrounding furniture, articles. The patient must remain uncovered and left in original state. Please note, this does not pertain to MVA fatalities.

### Certification Requirements:

1. The above procedures can be completed by any level provider.
2. In any case not meeting the BLS criteria for withholding resuscitation, a paramedic must confirm death and appropriately document care and rhythm strip in their patient care report (PCR).

# Standard Policies

## Firefighter Rehabilitation

1.9

### Policy:

- At the request of the fire department on-scene commander, EMS may be asked to perform firefighter rehabilitation.

### Purpose:

- Provide parameters for normal vital signs.
- Identify individuals requiring treatment and transport.

### Procedure

1. Encourage the removal of all PPE (including bunker pants), rest, cooling, and oral hydration
2. Assess pulse rate. If greater than 85 percent maximum for age (see note below) perform orthostatic vitals. If pulse rate increases greater than 20 bpm or a systolic B/P drop more than 20 strongly suggest immediate IV hydration and transport.
3. Assessment of vital signs after the responder has rested for 10 minutes after their last exertion.
  - a. Abnormal vital signs include:
    1. Blood pressure: systolic greater than 200 or diastolic greater than 110.
    2. Heart rate greater than 110.
    3. Respirations less than 8 or greater than 40 per minute.
    4. Temperature greater than 101.
    5. Pulse oximetry less than 90%.
    6. CO greater than 10%.
4. If any abnormal vital signs, strongly suggest rest, rehydration, and active cooling. Re-evaluate in 10 minutes and strongly suggest transport with no improvement in total rehab time of 30 minutes. Report all abnormal vital signs to the on-scene fire incident commander or rehab officer.
5. Fire personnel should not be medically cleared to return to full duty with abnormal vital signs.
6. Any person with abnormal vital signs who refuse intervention or return to full duty against medical advice will sign a refusal.
7. Transport will be encouraged automatically for the following:
  - a. Chest pain.
  - b. Shortness of breath unresolved by 10 minutes of high flow O<sub>2</sub>.
  - c. Heart rhythm other than normal sinus or sinus tach.
  - d. Syncope, disorientation, or confusion.
  - e. Vital signs that have not returned to normal limits after 30 minutes of rehabilitation.
  - f. Inability to hold fluids down or vomiting.
  - g. Any request for transport.

**Notes:** NFPA Age-Predicted 85% maximum heart rate

Age	85 Percent
•20-25	170
•25-30	165
•30-35	160
•35-40	155
•40-45	152
•45-50	148
•50-55	140
•55-60	136
•60-65	132

# Standard Policies

## Infant Abandonment

1.10

### Policy:

- The Daniel's Law states that a "person who abandons a newborn (infant up to 60 days old) cannot be prosecuted for abandonment if he or she takes the **unharm**ed baby to staff or an employee of a Safe Haven. A Safe Haven is defined as "a hospital or hospital outpatient facility, a law enforcement agency, a fire station, an emergency medical services station, or any staffed house of worship during hours when the facility is staffed." Section 63-7-40.

### Purpose:

- To provide protection to infants who are placed into the custody of EMS under this law and to the EMS systems and personnel when confronted with this issue.

### Procedure:

1. Follow the **Universal Patient Care Protocol**.
2. Follow the **Newly Born Protocol** as appropriate.
3. Initiate other treatment protocols as appropriate.
4. Keep infant warm.
5. Call local Department of Social Services (DSS) 864-467-7750 as soon as infant is stabilized.
6. Transport infant to GMMC pediatrics.
7. Document protocols, procedures, and agency notifications in the patient care report (PCR).
8. Attempt to obtain the following:
  - a. Medical information about the baby's parents.
  - b. If possible, name of baby's parents (the person leaving the child does not have to reveal his or her identity).
  - c. Information about the birth.

# Inter-facility Medication Administration

**Policy:**

- Some patients may be required to be on a medication during transport. When this occurs, the inter-facility transport drugs must be initiated at the sending facility and the patient must be stabilized on the medication prior to transport.

**Purpose:**

- The Paramedic in charge of the call must also ensure that he/she has received adequate education and information on the inter-facility drugs to be transported with the patient (i.e. side effects, adverse reactions, etc.) **prior to** accepting the patient for transfer. This information is to be documented on the Inter-facility Drug Transport Form.

**Procedure:**

- When the crew arrives at the sending facility, they will receive a full verbal and written report. The Paramedic in charge of the call is responsible for accepting the patient and for ensuring that the appropriate documentation has been completed. The written report and all other documentation, including SC DHEC form 3485 (1/1/2010) necessary for transfer will accompany the patient.
- Paramedics are not authorized to mix inter-hospital transport drugs. If it is anticipated that the intravenous (IV) therapy will run out during transport, an additional bag of fluid should be supplied, pre-mixed, and piggybacked into the existing IV infusion before or during transport. Paramedics are not authorized to initiate any additional units of whole blood or packed cells during transport.
- When **Sodium Nitroprusside**, **Magnesium Sulfate**, and/or **Nitroglycerin** are being administered, a volumetric infusion pump and a noninvasive electronic blood pressure monitor are required during transport. Patients being transported on **Mannitol** require an indwelling urinary catheter to be in place prior to transport.
- Drugs will be monitored in transit by the Paramedic based upon signed, written orders of the sending physician. Only Paramedics are authorized to maintain these drugs.
- During transfer of the patient on an inter-facility transport drug, the Paramedic may reduce or discontinue the drug in the event of adverse reaction or complication or upon the direction of on-line Medical Control. The Paramedic may increase the rate of administration only with on-line physician direction.
- Time is of the essence in STEMI and stroke transfers. The goal is to have STEMI patients transferred within 30 minutes of arriving at a non-PCI center. To facilitate a quick transfer of patient care from the sending facility to EMS; North Greenville, Greer Memorial, and Hillcrest will attempt to have the patient on a Stryker Stretcher prior to EMS arrival.
  - In these cases, swap stretchers with the sending facility and accept the patient on the hospital's EMS stretcher. Retrieve the EMS stretcher at the completion of the call when operationally feasible. Attempt to reduce all delays and begin transport as rapidly as possible.
- At the completion of the call, scan the DHEC form 3485 and attach it to the electronic patient care report (PCR) in ESO. The hard copy can be placed in one of the secure green bags to be shredded. Additional forms, if needed, can be located on the "I" drive in the forms folder, attached to this document or in logistics.



# On-Scene Physicians

**Policy:**

- The medical direction of prehospital care at the scene of an emergency is the responsibility of those most appropriately trained in providing such care. All care should be provided within the rules and regulations of the State of South Carolina.

**Purpose:**

- To identify a chain of command to allow field personnel to adequately care for the patient.
- To assure the patient receives the maximum benefit from prehospital care.
- To minimize the liability of the EMS system as well as the on-scene physician.

**Procedure:**

1. When a non-Medical Control Physician offers assistance to EMS or the patient is being attended by a physician with whom they do not have an ongoing patient relationship, EMS personnel must review the On-Scene Physician Form with the physician. All requisite documentation must be verified and the physician must be approved by on-line Medical Control.
2. When the patient is being attended by a physician with whom they have an ongoing patient relationship, EMS personnel may follow orders given by the physician if the orders conform to current EMS guidelines, and if the physician signs the PCR. Notify Medical Control at the earliest opportunity. Any deviation from local EMS protocols requires the physician to accompany the patient to the hospital.
3. EMS personnel may accept orders from the patient's physician over the phone with the approval of Medical Control. The Paramedic should obtain the specific order and the physician's phone number for relay to Medical Control so that Medical Control can discuss any concerns with the physician directly.

# Standard Policies

## Police Custody

1.13

### Policy:

- For this policy to be used, the patient only needs to be in the care of police and does not have to be under police custody.
- All patients in police custody retain the right to request transport. This should be coordinated with law enforcement.

### Purpose:

- To assure the patient receives the appropriate care following encounter with law enforcement.

### Procedure:

1. Assess for evidence of traumatic injury or medical illness and follow appropriate protocol.
2. If a Taser® has been used, follow **Wound Care: Taser® Probe Removal Procedure** and appropriate trauma protocol.
3. If pepper spray has been used, irrigate the face and eyes and remove contaminated clothing.
  - a. Assess for dyspnea, wheezing and a history of asthma or COPD.
  - b. If patient has a history of a reactive airway disease or shows any signs of dyspnea or wheezing, observe for 20 minutes and follow appropriate respiratory protocol.
  - c. If an asthmatic patient is exposed to pepper spray and released to law enforcement, all parties should be advised to immediately re-contact EMS if wheezing or difficulty breathing occurs.
4. Assess patient for cardiac history, chest pain, or palpitations. If patient shows cardiac related signs or symptoms, follow appropriate cardiac protocol.
5. Continue to observe for agitated delirium syndrome.
  - a. 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.
6. If restraints are necessary, follow **Behavioral Emergencies/Chemical Restraint Protocol**.
  - a. Patients restrained by law enforcement devices cannot be transported in the ambulance without a law enforcement officer in the patient compartment who is capable of removing the devices.
7. If there is any doubt about the cause of the patient's alteration in mental status, transport the patient to the hospital for evaluation.
8. Coordinate disposition with patient, law enforcement and if necessary, Medical Control.
9. Never argue with law enforcement. If law enforcement interferes with the patient's ability to refuse or request care, attempt to obtain a police signature verifying refusal or request of care and report the incident to a supervisor.

# Standard Policies

## Trauma Activations

1.14

### Policy:

- EMS providers shall assess each adult and pediatric trauma patient using the following criteria upon contact.
- Once a level 1, 2, or 3 trauma alert patient is identified in the field through assessment, a crew member must contact GMH via recorded line as soon as practical and provide a report using the M.I.S.T format. The words “Trauma Alert” must be included in the report.
- All patients meeting the criteria list below (Level 1, Level 2, Level 3 Trauma alert) shall be transport to Greenville Memorial Hospital (Level 1 Trauma Center).
  - Follow 12.15 for complete criteria for Level 1, Level 2, and Level 3.
- If patient refuses transport to GMH and is deemed a “Trauma Alert” by the EMS professional, a refusal must be signed for alternate transport destination after explaining the risk of “life and limb” to the patient.
- Upon arrival in the Trauma bay EMS personnel will repeat the M.I.S.T report to the trauma team.

### Purpose:

- To ensure the patient receives the appropriate care following traumatic injuries.

### MIST Report

<b>M</b> = Mechanism of Injury	<ul style="list-style-type: none"><li>• Blunt</li><li>• Penetrating</li><li>• Burn</li><li>• Entrapment duration (PRN)</li></ul>
<b>I</b> = Injuries Sustained (AIRWAY)	<ul style="list-style-type: none"><li>• Injuries identified or suspected</li></ul>
<b>S</b> = Vital Signs and GCS	<ul style="list-style-type: none"><li>• Current VS and O2 sat</li><li>• Lowest BP</li><li>• GCS</li><li>• Pupils</li></ul>
<b>T</b> = Treatment (What did EMS do?)	<ul style="list-style-type: none"><li>• IV's – location/size</li><li>• Fluids/Blood – type and volume infused</li><li>• Procedures (include meds)</li></ul>

# Duty to Act

**Policy:**

- Greenville County Emergency Medical Services and all DHEC Licensed Rapid Responder Agencies that follow these COG's shall report all calls encountered during routine operations and ensure all potentially injured citizens are cared for.

**Purpose:**

- To provide guidance to all field personnel on your required duty to act in the event that you encounter an additional or different patient than assigned needing medical treatment.

**Procedure:****Unit enroute to a call find another call**

- Notify the Communications Center that you are stopping at the scene to assess the patient(s).
- Crew must evaluate all information and make a decision to attend the patient at the greatest risk based on:
  - The Communication Center's assessment of the condition of the patient at the scene of the original call.
  - The condition of the patient at the scene of the found call.
  - Consider the response time that a second ambulance would have to travel to either call.
  - Are there first responders or medically trained personnel on the scene and available to respond to either call?
- ▽ Once you determine which call has the greatest risk for the patient, alert the Communications Center of the call you plan to attend.

**Ambulance transporting a non-critical patient comes upon another call**

- Advise the Communications Center that you are stopping at the scene to access the patients.
- If the patient of the found call does not require ALS and the first responders are on the scene, you may elect to continue transport of the original patient.
- If you elect to continue transport, advise the found patient(s) that you will have a second ambulance respond.
- If the found patient is critical and requires ALS, your partner will remain with your original patient while you attend to the found patient(s).

**Ambulance has an emergency patient on board and finds a second call**

- Slow down or stop only long enough to inform the citizens at the scene that you have a critical patient on-board and another ambulance is enroute. Continue immediate transport of the first patient.
- Ensure Communications Center awareness of incident location and that additional resources are responding.

**Responding Agency is advised that there are now more than one patient in a nursing or other healthcare facility requiring EMS**

- Notify the Communications Center that you have staff requesting another ambulance for a different patient.
- Crew must evaluate all information and make a decision to attend the patient at the greatest risk based on:
  - The condition of the patient at the scene for the original call.
  - The condition of the second patient at the scene.
- Crew may have to split up to provide care to both patients until additional resources arrive.
- If contact is already made with original patient and crew is unable to split up, advise staff of situation and that there is another ambulance on the way.

# Standard Policies

## Requesting Blood Products

1.16

### Policy:

- Blood products can be requested whenever patient care can be improved by decreasing time to treatment.

### Purpose:

- Improve patient care in the pre-hospital setting.
- Provide timely access to life-saving treatment of blood products

### Criteria:

1. The patient meets the mechanism of injury or nature of illness below and has at least two physiological parameters, the request may be made.
  - a. For blood administration request, patients must be  $\geq 2$  years of age with:
    - i. Signs of massive hemorrhage
    - ii. Traumatic injury (penetrating or blunt)
    - iii. Suspected dissecting/rupturing aneurysm ( abdominal or thoracic)
    - iv. Gastrointestinal bleeding
    - v. Signs of intra-abdominal bleeding
  - b. Physiological Parameters
    - i. Systolic blood pressure  $< 90$  mm Hg
    - ii. Heart rate  $> 120$  bpm
    - iii. Shock Index (SI)  $> 0.9$  (Shock Index is calculated by the following:  $SI = \text{Heart rate divided by systolic blood pressure}$ )
    - iv. Pediatric patients  $\geq 2$  years of age whose vital signs are consistent with blood loss as defined by their weight or age-based parameters in the Pediatric Multiple Trauma Protocol

### Personnel Requirements for Activation

1. Any GCEMS employee or first responder personnel present at the scene of an injury or medical condition, and after an initial patient assessment may request this service.
2. The Medical Director, Operations Supervisor or any other administrative personnel may make the request prior to patient assessment if the mechanism of injury or patient's condition reflects the potential for blood administration

### Personnel Requirements for Deactivation

1. GCEMS paramedic after patient evaluation
2. Operations Supervisor or administrative personnel at any time
3. The Medical Director or on-line medical control at any time

### Procedure:

1. After patient assessment and determining blood products will be needed, notify MedCom, Medcom will coordinate with GCEMS Advanced Paramedic Unit or Prisma Health and report back details of response and an ETA.
2. Continue your assessment and treatment of the patient until the responding unit arrives at the scene.

**Note: At no time should a GCEMS ambulance remain on the scene and not initiate emergent transport to the appropriate medical facility. If transport has been initiated prior to the arrival of blood products, they may intercept prior to hospital arrival.**

# Standard Policies

## Requesting Blood Products (continued)

1.16

### Patient Preparation:

- GCEMS personnel will follow departmental guidelines regarding care for trauma patients; however, the following will be included for patients where blood products are to be administered:
  - The patient is fully exposed when applicable per protocol
  - The patient's airway is intact and managed by ensuring the following:
    - Patient alert and following commands
    - Advanced airway in place with confirmation of CO2 waveform

### Criteria:

- Hypoxia has been corrected
  - Patient is on supplemental Oxygen
  - Goal of oxygen saturation greater than 94%
- External bleeding is controlled
  - All major injuries with bleeding have been addressed
  - Tourniquet placed for hemorrhage not controlled with pressure
- IV/IO access is placed, functional and not infiltrated
  - Patient has 2 IV/IO sites
    - Adult 18g IV minimum
    - Pediatric 20g IV minimum
- The patient is covered with a blanket
- If GCEMS personnel can assist in having these items done prior to arrival as appropriate, this will streamline the checklist process and help get blood products on board faster while transport is being facilitated

**Note: While Greenville County EMS personnel will always be ultimately responsible for all patient care activities, the GCEMS Advanced Paramedic or Prisma Health Paramedic will be responsible for transfusion administration and related reactions should they occur.**

The following standard describes how a patient may make an informed decision to accept or refuse evaluation, treatment and/or transport.

**Background:**

All patients are presumed to have a condition requiring evaluation, treatment, and transportation to the closest appropriate ED. Patients have the right to refuse part or all of the evaluation, treatment, and transport if they have decisional capacity.

**Procedure:**

- Evaluate patient to the fullest extent indicated and determine if the patient is the appropriate medical decision maker.
- If the patient does not appear to have decision capacity, proceed with evaluation, treatment, and transport under implied consent.
- If the patient appears to have capacity, he or she may refuse all or part of the indicated evaluation, treatment recommended, and transport destination.
- If the patient has questionable decision-making capacity, complete the capacity assessment in PCR.
  - If the patient passes the assessment, he or she may refuse treatment.
  - If the patient fails, proceed under implied consent.
- In cases involving third-party consent, ensure the responsible party has decisional capacity prior to allowing decisions to be made on behalf of the patient.
  - Document the third party's relationship to the patient
  - If there is doubt as to whether or not the third party is acting in the patient's best interest (e.g., abuse or neglect), immediately involve law enforcement.
- Documentation for a patient refusing services must include at a MINIMUM:
  - The benefits of allowing care
  - The risks of refusing care including severe complications or death
  - The alternatives explained and offered
- Attempt to ensure the patient is left in a safe location.

**Medical Control**

- Contact medical control if:
  - After passing the capacity assessment, doubt remains as to the patient's decisional capacity, or if the patient's current medical condition (e.g. hypotension, hypoxia, head injury, etc.) calls into question decisional capacity.
  - Other unusual situations where the correct course of action is not apparent based on the criteria of this standard.



# Airway: Apneic Oxygenation

## Clinical Indications:

- Pre-oxygenation of the RSI and MFI candidate.

## Procedure:

1. Position the patient in the optimized position (head-up 20 to 45 degrees).
2. Place a nasal cannula in the patient's nares and connect to an oxygen regulator.
3. Place a BVM or CPAP device at 5 cm H<sub>2</sub>O over the nasal cannula and connect to a second oxygen regulator. **A non-rebreather is not sufficient to provide adequate pre-oxygenation.**
4. If the patient is not saturating above 90% provide ventilations utilizing a bag valve mask.
5. Administer sedative.
6. Position the patient into the sniffing position and manually open the airway utilizing two hands.
7. Attempt to maintain an oxygen saturation greater than 95%.
8. Remove the nasal cannula if unable to get a high quality seal with the CPAP or bag valve mask.
9. Administer paralytic.
10. Remove CPAP or bag valve mask and leave the nasal cannula flowing at 15 Lpm.
11. Intubate the trachea and confirm tube placement with waveform capnography.
12. Remove the nasal cannula.

## PEARLS:

- Apneic oxygenation can still benefit the trauma patient; keep the patient supine with spinal precautions in place and do not use CPAP.

## Certification Requirements:

- The skill of apneic oxygenation can be completed by all levels of EMT. However, intubation remains strictly a Paramedic level skill. Maintain knowledge of the indications, contraindications, technique, and possible complications of the procedure. Assessment should include direct observation at least once every two years.

B	EMT
A	Advanced EMT
P	Paramedic

# Airway: BIAD IGEL

## Clinical Indications:

- Longer EMS transport distances or an inability to adequately ventilate a patient with a bag valve mask 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.
- **WARNING: This airway may not prevent aspiration of stomach contents!**

## Procedure:

1. Pre-oxygenate and hyperventilate the patient.
2. Select the appropriate tube size for the patient.
3. Lubricate the tube.
4. Place patient in sniffing position and gently press down on chin.
5. Insert the leading soft tip into the mouth of the patient in a direction towards the hard palate. Guide the device downwards and backwards along the hard palate with a continuous but gentle push until a definitive resistance is felt.
6. Incisors should be resting on the integral bite-block.
7. **Ventilate the patient.**
8. Auscultate for breath sounds over the lungs and epigastrium and look for the chest to rise and fall.
9. Secure the tube to the patient's face.
10. **Confirm tube placement using end-tidal CO<sub>2</sub> detector.**
11. Waveform capnography must be utilized immediately upon its availability.
12. The airway must be monitored continuously through waveform capnography and pulse oximetry.
13. Complete an airway evaluation form and obtain confirmation signature in 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 medical control. Assessment should include direct observation at least once per certification cycle.

B	EMT
A	Advanced EMT
P	Paramedic

# Airway: CPAP

**Clinical Indications:**

- Reactive airway disease patients with suspected inadequate ventilation, adequate mental status and enough respiratory drive to allow CPAP to function.
- For apneic oxygenation where the patient has an adequate respiratory drive and the airway is able to be manually opened and maintained. This includes CHF, pneumonia, asthma, and COPD.

**Contraindications:**

- Facial features or deformities that prevent an adequate mask seal.
- Excessive respiratory secretions.
- Inability to maintain own airway.
- Hypotension (systolic blood pressure below 90mm/hg)

**Procedure:**

1. Ensure adequate oxygen supply to ventilation device.
2. Explain the procedure to the patient.
3. Consider placement of a nasopharyngeal airway.
4. Place the delivery mask over the mouth and nose. **Oxygen** should be flowing through the device at this point.
5. Secure the mask with provided straps starting with the lower straps until minimal air leak occurs.
6. For reactive airway disease (i.e., COPD) set the positive end expiratory pressure (PEEP) at 3-5 cm H<sub>2</sub>O. Use the lowest possible setting to avoid barotrauma.
7. For pulmonary edema, near drowning, aspiration and pneumonia set the PEEP at 5-10 cm H<sub>2</sub>O. Use the lowest possible setting to avoid barotrauma.
8. For apneic oxygenation set the PEEP at 5 cm H<sub>2</sub>O.
9. Evaluate the response of the patient by assessing breath sounds, oxygen saturation, and general appearance.
10. Oxygen levels should be titrated to the patient's response. Many patients respond to lower FiO<sub>2</sub> (30%-50%).
11. Encourage the patient to allow forced ventilation to occur. Observe closely for signs of complications. The patient must be breathing for optimal use of the CPAP device.
12. Document time and response on 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 medical control.
- CPAP application can be completed by all levels of EMT.

B	EMT
A	Advanced EMT
P	Paramedic

## Airway: Endotracheal Tube Introducer (Bougie)

**Clinical Indications:**

- Patient meets clinical indications for oral intubation.

**Contraindications:**

- Three attempts at oral tracheal intubation (follow **Airway Protocol**).
- Age less than 8 or endotracheal tube size less than 6.5 mm.

**Procedure:**

1. Prepare, position and oxygenate the patient with **100% Oxygen**.
2. Select proper endotracheal tube (ETT) without stylet, test cuff and prepare suction.
3. Lubricate the distal end and cuff of the 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 anteriorly and visualize the tip passing the vocal cords or above the arytenoids if the cords cannot be visualized.
6. Once inserted, gently advance the Bougie® until you meet resistance or "hold-up" (if you do not meet resistance you have a probable esophageal intubation and insertion should be reattempted or the **Airway Protocol** implemented as indicated).
7. Withdraw the Bougie® **ONLY** to a depth sufficient to allow loading of the ETT while maintaining proximal control of the Bougie®.
8. Gently advance the Bougie® and loaded ETT until you have hold-up again, thereby assuring tracheal placement and minimizing the risk of accidental displacement of the Bougie®.
9. While maintaining a firm grasp on the proximal Bougie®, introduce the ETT over the Bougie® passing the tube to its appropriate depth.
10. If you are unable to advance the ETT into the trachea and the Bougie® and ETT are adequately lubricated, withdraw the ETT slightly and rotate the ETT 90° COUNTER clockwise to turn the bevel of the ETT posteriorly. If this technique fails to facilitate passing of the ETT you may attempt direct laryngoscopy while advancing the ETT (this will require an assistant to maintain the position of the Bougie® and, if so desired, advance the ETT).
11. Once the ETT is correctly placed, hold the ETT securely and remove the Bougie®.
12. Inflate the cuff with 3 to 10 mL of air, auscultate for equal breath sounds and reposition accordingly.
13. Confirm and document tracheal placement using end-tidal CO<sub>2</sub> monitoring or an esophageal bulb device.
14. When final position is determined, secure the ETT, reassess breath sounds 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 medical control. Assessment should include direct observation at least once per certification cycle.

P

Paramedic

# Airway: Foreign Body Obstruction

## 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.
  - a. Do not interfere with a mild obstruction allowing the patient to clear their airway by coughing.
  - b. 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 sub-diaphragmatic 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, sub-diaphragmatic 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, 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 medical control.

B	EMT
A	Advanced EMT
P	Paramedic

# Airway: Intubation Nasotracheal

## Clinical Indications:

- A spontaneously breathing patient in need of intubation (i.e., 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 or >55 kg.

## Procedure:

1. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage.
2. Pre-oxygenate the patient. Lubricate the tube with **Lidocaine jelly**. The use of a BAAM® device is recommended.
3. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
4. 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, the air movement gets louder.
5. 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.
6. 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.
7. Auscultate for bilaterally equal breath sounds and absence of sounds over the epigastrium.
8. 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 waveform capnography.**
11. Secure the tube to the patient's face.
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 required that the airway be monitored continuously through waveform 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 medical control.

P

Paramedic

# Airway: Intubation Oral Tracheal

## Clinical Indications:

- Longer EMS transport distances or an inability to adequately ventilate a patient with a bag valve mask may require a more advanced airway.
- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.

## Procedure:

1. Prepare, position and oxygenate the patient with **100% Oxygen**.
2. Select proper endotracheal tube (ETT) (and stylet, if used)(**No ETT larger than a 7.5**), have suction ready.
3. Utilize endotracheal tube introducer (Bougie®) according to **Airway: Endotracheal Tube Introducer (Bougie®)**

### Procedure.

4. Using laryngoscope, visualize vocal cords (use Sellick maneuver/BURP to assist).
5. Limit each intubation attempt to 30 seconds with bag valve mask between attempts.
6. Visualize tube passing through vocal cords.
7. Inflate the cuff with 3 to 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 bag valve mask.
9. Apply waveform capnography monitor. After 3 ventilations, EtCO<sub>2</sub> should be greater than 10 or comparable to pre-intubation values. If less than 10, check for adequate circulation, equipment, and ventilatory rate. If EtCO<sub>2</sub> is still less than 10 without physiologic explanation, remove the ETT and ventilate by bag valve mask.
10. Consider using a blind insertion airway device if intubation efforts are unsuccessful.
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 positive or negative breath sounds before and after each movement of the patient.
12. **It is required that the airway be monitored continuously through waveform capnography and pulse oximetry.**

## Sterile Suctioning Procedure:

### Indications:

- Obstruction
- Excessive Secretions

**Complications Suctioning May Induce:** Hypoxemia, Cardiac Arrhythmia, Soft Tissue Trauma, Infection, Increasing ICP

### Procedure Steps:

1. Preoxygenate the patient for 1-2min.
2. Maintain universal precautions and a sterile technique.
3. To measure insertion depth, place the tip of French ("whistle tip") catheter at the corner of the patient's mouth and measure to the angle of the jaw.
4. Lubricate the catheter for insertion.
5. Insert to premeasured depth (step 3) or until the patient coughs.
6. Apply suction only while removing the catheter and remove with a twisting motion.
7. Suction for no longer than 10 seconds, cardiac monitoring should be observed during this procedure for dysrhythmia, rinse catheter in sterile water.
8. Observe the patient's response to suctioning, and, if need be, repeat this procedure from Step 1.

## 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 medical control. Assessment should include direct observation at least once per certification cycle.

P

Paramedic



# Standard Procedure (Skill)

## Airway: Bag Valve Mask

2.8

### Clinical Indications:

- Respiratory failure or arrest with inadequate oxygenation and/or ventilation.
- Pre-oxygenation for advanced airway.
- Artificial ventilation after placement of advanced airway.
- 

### Clinical Contraindications:

- Complete upper-airway obstruction.

### Procedure:

1. Prepare all equipment.
2. Select the appropriate size BVM (Adult, Pediatric, Infant/Neonate).
3. Attach BVM to 100% oxygen at 15 liters per minute and ensure the reservoir bag fills completely. See **Newly Born COG for neonatal resuscitation**.
4. Attach PEEP valve and set at appropriate pressure if indicated for adult patients.
5. Place patient into optimal position.
6. Consider suctioning airway and utilizing airway adjunct.
7. Two person BVM technique is preferred.
8. Place the apex of the mask over the bridge of the patient's nose, and then seal the mask over the patient's chin.
9. Open airway utilizing either the V-E or C-E Two handed mask grip.
10. Gently compress the bag to ventilate the patient. These can be timed with spontaneous breaths if necessary.
11. Gauge the effort required to ventilate through the feel of the recoil bag to achieve minimal rise and fall of the chest. Excess pressure and volume is detrimental to the patient.
12. Ventilation rate/minute should be 30 for neonates, 25 for toddlers, 20 for school age and 10 to 12 for adults.
13. Maintain an EtCO<sub>2</sub> between 35 and 45.
14. If equipped, utilize the integrated manometer to help deliver safe inspiratory pressures to your patient. Most patients do not need more than 30 cm of Peak Inspiratory Pressure (PIP) pressure.
15. If equipped, consider overriding integrated pressure relief valve if clinically indicated.

### 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 medical control. Assessment should include direct observation once per certification cycle.

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic

# Airway: Tracheostomy Tube Change

## Clinical Indications:

- Presence of tracheostomy site.
- Urgent or emergent indication to change the tube, such as obstruction that will not clear with suction, dislodgement, or inability to oxygenate or ventilate the patient without other obvious explanation.

## Procedure:

1. Have all airway equipment prepared for standard airway management, including equipment for oral tracheal intubation and failed airway.
2. Have airway device (endotracheal tube or tracheostomy tube) of the same size as the tracheostomy tube currently in place as well as 0.5 size smaller available (i.e., if the patient has a 6.0 Shiley, then have a 6.0 and a 5.5 tube).
3. Lubricate the replacement tube(s) and check the cuff.
4. Remove the tracheostomy tube from mechanical ventilation devices and use a bag-valve apparatus to pre-oxygenate the patient as much as possible.
5. Once all equipment is in place, remove devices securing the tracheostomy tube, including sutures and/or supporting bandages.
6. If applicable, deflate the cuff on the tube. If unable to aspirate air with a syringe, cut the balloon off to allow the cuff to lose pressure.
7. Remove the tracheostomy tube.
8. Insert the replacement tube. Confirm placement via standard measures except for esophageal detection (which is ineffective for surgical airways).
9. If there is any difficulty placing the tube, re-attempt procedure with the smaller tube.
10. If difficulty is still encountered, use standard airway procedures such as oral bag-valve mask or endotracheal intubation (as per protocol). **More difficulty with tube changing can be anticipated for tracheostomy sites that are immature – e.g. less than two weeks old. Great caution should be exercised in attempts to change immature tracheostomy sites.**
11. Document procedure, confirmation, patient response, and any complications in the patient care report (PCR).

## Tracheostomy Tube Suctioning Procedure:

**Indications:** Obstruction, Excessive Secretions

**Complications Suctioning May Induce:** Hypoxemia, Cardiac Arrhythmia, Soft Tissue Trauma, Infection, Increasing ICP

## Steps

1. Preoxygenate the patient for 1-2min (if unable to ventilate due to secretions quickly move to step 2).
2. Maintain universal precautions and a sterile technique.
3. Lubricate a French ("whistle tip") catheter
4. Inject 3ml of saline through the stoma and into the trachea
5. If the patient is responsive, instruct them to exhale and/or insert the catheter until resistance is felt (do not exceed 12cm).
6. Apply suction only while removing the catheter and remove with a twisting motion.
7. Suction for no longer than 10 seconds, cardiac monitoring should be observed during this procedure for dysrhythmia, rinse catheter in sterile water.
8. Observe the patient's response to suctioning, and, if need be, repeat this procedure from Step 1.

**EMERGENT SUCTIONING of Tracheostomy Tube may be performed by ALL Levels (when patient is unable to breathe adequately).**

## 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 medical control.

P

Paramedic

# Airway/Breathing: Capnography

**Clinical Indications:**

- Capnography shall be used when available with the use of all invasive airway procedures including endotracheal, nasotracheal, cricothyrotomy, blind insertion airway devices (BIAD), or CPAP.
- Capnography should also be used when administering narcotics and/or sedatives.

**Procedure:**

1. Select the appropriate EtCO<sub>2</sub> accessory for the patient.
2. Open the CO<sub>2</sub> port door and insert the FilterLine connector; turn connector clockwise until tight.
3. Verify that the CO<sub>2</sub> area is displayed.
4. Using the speed dial, select waveform in either channel 2 or 3 or select capnography after pressing the LEAD button.
5. Connect the CO<sub>2</sub> FilterLine set to the patient via BIAD, endotracheal tube, or oxygen delivery device.
6. Confirm that the EtCO<sub>2</sub> value and waveform are displayed. The monitor automatically selects the scale for the best visualization of the waveform. You can change the scale, if desired, using the speed dial knob.
7. A CO<sub>2</sub> waveform appears when any CO<sub>2</sub> is detected, but CO<sub>2</sub> must be greater than 3.5 mmHg for a numerical value to be displayed. However, the CO<sub>2</sub> module will not recognize a breath until the CO<sub>2</sub> is at least 8 mmHg.
8. Note CO<sub>2</sub> level and waveform changes on each respiratory failure, cardiac arrest, or respiratory distress patient.
9. The capnometer shall remain in place with the airway and be monitored throughout prehospital care.
10. Loss of CO<sub>2</sub> detection or waveform usually indicates an airway problem and should be documented.
11. 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 medical control.

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic

**Clinical Indications:**

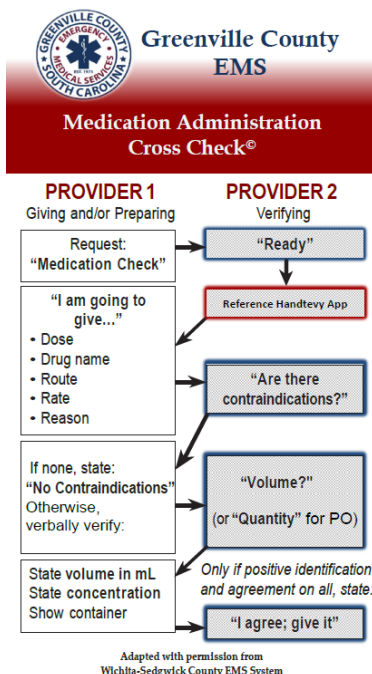
- Patients experiencing bronchospasm.

**Procedure:**

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill the premixed drug (such as **Albuterol (Ventolin)** or other approved drug) into the reservoir well of the nebulizer.
4. Connect the nebulizer device to **Oxygen** at 4 to 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.
  - a. Consider using aerosol mask as needed
  - b. Consider using CPAP to assist in administration in severe respiratory distress patients
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. 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 medical control.



B	EMT
A	Advanced EMT
P	Paramedic

# Assessment: Pain 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 patient care report (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 0-10, 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).

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

## 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 medical control.

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic

# Standard Procedure (Skill)

## Assessment: 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 92%-94%, suspect a respiratory compromise, which may or may not be a chronic condition (e.g., COPD).
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. Supplemental **Oxygen** is not required if the oxyhemoglobin saturation is greater than or equal to 94%. If there are obvious signs of ischemia, heart failure, dyspnea, or hypoxia, the goal is to maintain saturation between 90%-99% depending on patient condition.
10. Factors which may reduce the reliability of the pulse oximetry reading include but are not limited to:
  - a. Poor peripheral circulation (i.e., blood volume, hypotension, hypothermia).
  - b. Excessive pulse oximeter sensor motion.
  - c. Fingernail polish (may be removed with acetone pad).
  - d. Carbon monoxide bound to hemoglobin.
  - e. Irregular heart rhythms (e.g., atrial fibrillation, SVT, etc.).
  - f. Jaundice.
  - g. Placement of blood pressure cuff on same extremity as pulse oximetry 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 medical control.

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic

# Cardiac: 12 lead Placement

## Clinical Indications:

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

## Procedure:

1. Assess patient and monitor cardiac status.
2. Administer **Oxygen** as patient condition warrants.
3. If patient is unstable, definitive treatment is the priority. If 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 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:
  - a. RA: Right arm
  - b. LA: Left arm
  - c. RL: Right leg
  - d. LL: Left leg
  - e. V1: 4<sup>th</sup> intercostal space at right sternal border
  - f. V2: 4<sup>th</sup> intercostal space at left sternal border
  - g. V3: Directly between V2 and V4
  - h. V4: 5<sup>th</sup> intercostal space at midclavicular line
  - i. V5: Level with V4 at left anterior axillary line
  - j. V6: Level with V5 at left midaxillary line
8. Instruct the 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 lead acquisition will be interrupted until the noise is removed.
11. If an inferior infarct is suspected, obtain a right-sided and posterior (15-Lead) EKG.
12. For a 15-Lead EKG apply chest leads using the following landmarks:
  - a. V7: Use lead V4 and place on right side 5<sup>th</sup> intercostal space at midclavicular line
  - b. V8: Use lead V5 and place under left scapula at midclavicular line
  - c. V9: Use lead V6 and place under tip of left scapula
13. Once acquired, transmit the 12-Lead EKG data by fax to the appropriate hospital and notify the hospital of the 12-Lead EKG transmission. **Do not transmit the 15-Lead EKG.**
14. Monitor the patient while continuing with the treatment protocol.
15. Download data as per guidelines and attach a copy of the EKG's to the patient care report (PCR).
16. Document the procedure, time, and results on/with 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 medical control.





**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.

**External Pacing Procedure:**

1. Attach standard 4-Lead monitor.
2. Consider the use of sedation or analgesia if patient is uncomfortable.
3. Apply defibrillation/pacing pads to right upper chest and left lower chest as indicated by picture on pads.
4. Select pacing option on monitor unit.
5. Adjust heart rate to 70 BPM for an adult and appropriate BPM for a child as indicated by appropriate protocol.
6. Note pacer spikes on EKG screen.
7. Slowly increase output until capture of electrical rhythm on the monitor.
8. If unable to capture while at maximum current output, stop pacing immediately.
9. If capture observed on monitor, check for corresponding pulse and assess vital signs.
10. Document the dysrhythmia and the response to external pacing with EKG strips in the patient care report (PCR).

**Synchronized Cardioversion Clinical Indications:**

- Patients with symptomatic tachycardia (usually greater than 150 per minute) with signs and symptoms of inadequate cerebral or cardiac perfusion such as:
  - Chest pain.
  - Hypotension.
  - SOB
  - Altered mental status, confusion, etc.
  - Dizziness

**Synchronized Cardioversion Pacing Procedure:**

1. Attach standard 4-Lead monitor.
2. Consider the use of sedation or analgesia if patient is uncomfortable.
3. Apply defibrillation/pacing pads to right upper chest and left lower chest as indicated by picture on pads.
4. Select synchronize option on monitor unit.
5. Select appropriate energy setting for an adult and pediatric indicated by appropriate protocol.
6. Note that you have R wave capture on EKG screen.
7. Select charge on the monitor
8. Once the monitor has charged to the appropriate energy setting, clear the patient. Hold and press the shock button until shock delivered. Ensure you have R wave capture prior to shock.
9. After shock has delivered, check for rhythm conversion and assess vital signs.
10. Consider increasing energy setting if initial attempt is unsuccessful per protocol.
11. Document the dysrhythmia and the response to cardioversion with EKG strips 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 medical control. Assessment should include direct observation at least once per certification cycle.



# Cardiac: Double Sequential Defibrillation

## Clinical Indications:

- Adult patients ( $\geq 18$  years) with refractory ventricular fibrillation (VF) or pulseless ventricular tachycardia (VT).
- Refractory VF/VT defined as persistent VF/VT after:
  - Three consecutive standard defibrillation attempts, and
  - Adequate CPR and administration of appropriate ACLS

## Procedure:

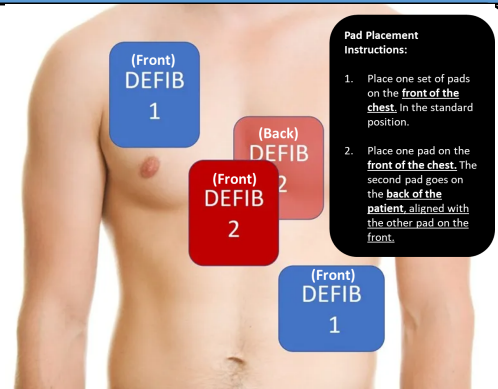
- Initial Management:**
  - Confirm cardiac arrest and initiate high-quality CPR.
  - Attach standard defibrillator pads and monitor rhythm.
  - Perform three consecutive defibrillation attempts with appropriate energy levels
  - Administer appropriate medications (e.g., epinephrine, amiodarone) according to ACLS guidelines.
- Indication for DSD:**
  - If VF/VT persists **after three consecutive single defibrillation attempts including the administration of 300 mg of Amiodarone**, consider DSD.
- Preparation for DSD:**
  - Obtain a second defibrillator.
  - Apply a second set of defibrillator pads. Optimal pad placement for DSD involves:
    - Primary defibrillator: Anterior-posterior (AP) positioning.
    - Secondary defibrillator: Anterior-lateral (AL) positioning (or vice versa if AP positioning is used for the first defibrillator).
- Performing DSD:**
  - Ensure both defibrillators are charged to the maximum recommended energy.
  - Deliver the shocks **within 1 second of each other** for optimal efficacy.
- Post-DSD Management:**
  - Immediately resume high-quality CPR for 2 minutes.
  - Reassess rhythm and patient condition.
  - Continue standard ACLS protocols.
- Documentation:**
  - Document the use of DSD, including the number of shocks, energy levels, pad placement, and patient response in ePCR.
  - Note the time of initiation and any complications or deviations from the protocol.

## Special Considerations:

- Ensure all team members are aware of the procedure and clear communication occurs.
- **DSD should be considered a last resort after standard defibrillation attempts and ACLS measures have failed.**

## Training and Competency:

- Personnel **MUST** receive initial, and ongoing, in-person training on DSD, including indications, technique, and potential complications prior to performing procedure.



P

Paramedic

# Standard Procedure (Skill)

## Automatic Implantable Cardio-Defibrillator (AICD) Deactivation/Asynchronous Pacing

2.15.2  
(A)

### Clinical Indications:

- **Inappropriate AICD Defibrillation:** Use to stop recurrent, inappropriate shocks caused by device malfunction.
- **Pacemaker Malfunction “Runway Pacemaker”:** Switches pacemaker to asynchronous (fixed-rate) mode for symptomatic rapid pacing.

### Key Characteristics of Device Malfunctions

#### Inappropriate AICD Shocks:

- Repeated shocks with stable hemodynamics.
- Non-VT/VF rhythm on ECG (e.g., AFib with RVR or SVT).
- Oversensing normal signals or interference.
- Patient reports pain or distress from shocks.

#### Runaway Pacemaker:

- Pacing often at rates >180 bpm.
- Failure to sense intrinsic cardiac activity.
- Symptoms: chest pain, SOB, dizziness, syncope, or hypotension.

### Procedure

1. **Paramedic contacts online medical control (OLMC)** to obtain authorization to proceed.
2. **Monitor ECG** and verify:
  - Inappropriate AICD discharges in the presence of a non-VT/VF rhythm or malfunctioning pacemaker causing pacemaker-induced tachycardia, exceeding physiological need.
3. **Place external defib pads on the patient:** No therapies will be delivered while the magnet is applied, even for life threatening arrhythmias. Be prepared to manage the patient following relevant cardiac guidelines.
4. **Locate the device:** Identify the position of the AICD or pacemaker. **(see 2.15.2-B for visual image)**
5. **Apply the doughnut magnet** directly over the generator. **(see 2.15.2-B for visual image)**
6. **Secure the magnet:** After confirming successful AICD deactivation or pacemaker switching to asynchronous mode, tape the magnet securely in place and prepare for transport. **(see 2.15.2-B for visual image)**
7. **ECG monitoring:** Ensure continuous ECG monitoring.

### Notes and Precautions for Doughnut Magnets

- **Verify Diagnosis:** Confirm inappropriate AICD shocks or pacemaker malfunction via ECG.
- **Continuous Monitoring:** Ensure ECG monitoring and a defibrillator are available during use.
- **Pacemaker Effect:** Magnets switch pacemakers to asynchronous mode but they do not deactivate them.
- **Combination Devices (ICD & Pacemaker):** Magnets deactivate the defibrillator function but may not affect pacemaker operation.
- **Magnet-Resistant Devices:** Some AICDs are unaffected by magnets; consult OLMC again if deactivation fails.
- **Secure Storage:** Keep magnets away from credit cards, electronics, and magnetic-sensitive items.
- **Do Not Remove:** Once deactivated, leave the magnet in place to prevent device reactivation.
- **Documentation:** Device information (type, implant date, location) is important to document. A wallet card can typically be found with this information.
- **Cardiac Arrest:** Perform CPR and use external defibrillation if needed, regardless of AICD function.

M

Contact Medical Control

# Standard Procedure (Skill)

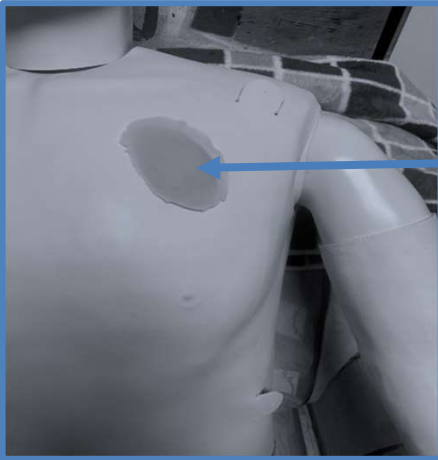
## Automatic Implantable Cardio-Defibrillator (AICD) Deactivation/Asynchronous Pacing

2.15.2  
(B)

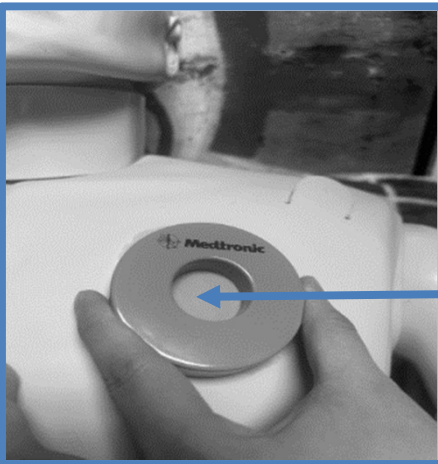
### Clinical Indications:

- **Inappropriate AICD Defibrillation:** Use to stop recurrent, inappropriate shocks caused by device malfunction.
- **Pacemaker Malfunction “Runway Pacemaker”:** Switches pacemaker to asynchronous (fixed-rate) mode for symptomatic rapid pacing.

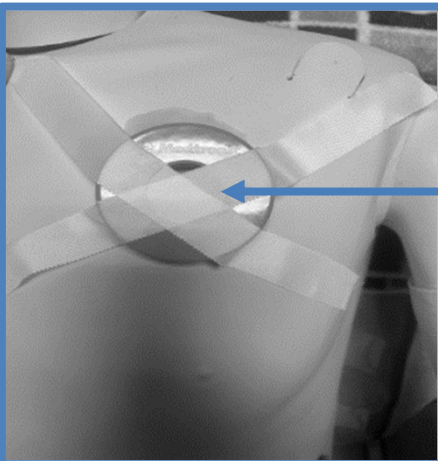
**See 2.25.2 (A) for Steps 1-3**



**Step 4:** Identify the position of the AICD or pacemaker



**Step 5:** Apply the doughnut magnet directly over the generator.



**Step 6:** After confirming successful AICD deactivation or pacemaker switching to asynchronous mode, **tape the magnet securely in place.**

**M**

Contact Medical Control

## Standard Procedure (Skill)

# Treatment: Child Birth

**Clinical Indications:**

- Imminent delivery with crowning.

**Procedure:**

1. Delivery should be monitored 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 the umbilical cord 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 airway with a bulb syringe beginning with the mouth.
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 to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Document time of birth.
9. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
10. Record APGAR scores at 1 and 5 minutes.
11. Follow the **Newly Born Protocol** for further treatment.
12. The placenta should deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
13. Massaging the uterus may decrease bleeding by facilitating uterine contractions.
14. Continue 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 medical control.

B	EMT
A	Advanced EMT
P	Paramedic

# Treatment: 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 affects for law enforcement.
- Monitor all patients for environmental illness.
- Transport patients 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 medical control.

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic

# Treatment: Pleural Decompression

## Clinical Indications:

- To relieve tension pneumothorax.
  - May occur in the setting of chest trauma, COPD, PPV, spontaneously
  - Consider among (H's and T's) in cardiac arrest. Particularly in the setting of penetrating traumatic arrest.

## Signs and symptoms include:

- Clinical evidence of a pneumothorax
  - Absent or decreased unilateral breath sounds.
  - Other less sensitive signs include:
    - Asymmetrical chest movement with inspiration
    - Hyper-expanded chest on affected side
    - Increased resistance to positive pressure ventilation, especially if intubated

## 5 B8

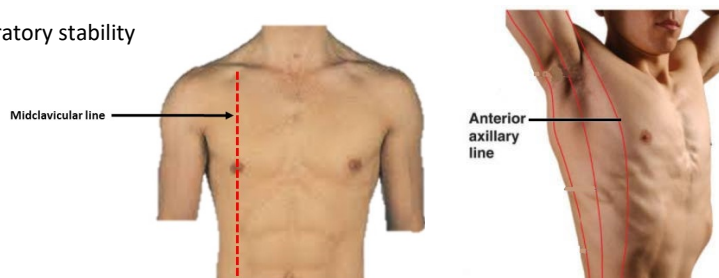
- Evidence of tension physiology
  - **Signs and Symptoms of Clinical Deterioration:** Decreasing blood pressure, increased work of breathing, restlessness, worsening skin color, pallor, diaphoresis, expanding crepitus.

## Procedure:

- Elevate head of stretcher to 30 degrees.
- Expose the entire chest.
- Identify the second intercostal space midclavicular on the side of the pneumothorax.
  - Place finger on the clavicle at its midpoint.
  - Run this finger straight down the chest wall to locate the first palpable rib between the clavicle.
  - The second intercostal space lies just below this rib, midway between the clavicle and the nipple line.
- Alternatively, identify the 4th or 5th intercostal space, anterior-axillary line. (Preferred location in patients with larger chest size)
  - Raise arm above and over head.
  - Identify the edge of the pectoralis muscle. (anterior axillary line)
  - The nipple line or inferior-most border of axillary hair typically represents the 4th intercostal space.
    - Consider that the nipple may be displaced inferiorly in female patients, may not correlate with the 4th ICS.
- Cleanse the area with an alcohol or povidone-iodine swab.
- Select a 10, 12, or 14 gauge (at least) 3" IV catheter (Pediatric: 16 gauge, 1 ¼ inch).
- Advance the needle above the rib. (blood vessels and nerves run along the underside of the rib.)
- As you enter the pleural space, you will feel a pop and note a rush of air expelling.
- Advance the catheter into the chest and then withdraw the needle. Be careful not to kink the catheter.
- Auscultate breath sounds.
- Secure with gauze and tape.
- Ventilate and monitor ETCO<sub>2</sub>.
- If symptoms fail to improve, consider the site alternate to initial attempted (above), contact Online medical control for further guidance.

## Contraindications:

- Hemodynamic and respiratory stability



P

Paramedic

# Treatment: Subcutaneous & Intramuscular

## Clinical Indications:

- When medication administration is necessary and the medication must be given via the subcutaneous (SQ) (not auto-injector) or intramuscular (IM) route or as an alternative route in selected medications.

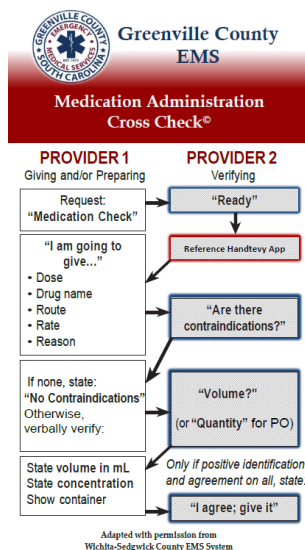
## Procedure:

- 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 SQ injection is the arm.
  - Injection volume should not exceed 1 mL.
- The possible injection sites for IM injections include the arm, buttock and thigh.
  - Injection volume should not exceed 1 mL for the arm.
  - Injection volume should not exceed 5 mL in the thigh or buttock. Multiple sites may be necessary in cases of **Magnesium Sulfate** administration.
  - EMT can only administer IM Epinephrine injection when Auto-Injector is not available.
- 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° angle, skin pinched**      **IM: 90° angle, 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 medical control.



B	EMT
A	Advanced EMT
P	Paramedic



# Treatment: Responder Pelvic Binder

## Clinical Indications:

- Pelvic fracture (with separation or diastasis) requiring immediate stabilization

## Contraindications:

- Ineffective in fractures that do not disrupt the pelvic ring

## Procedure:

## PRECAUTIONS

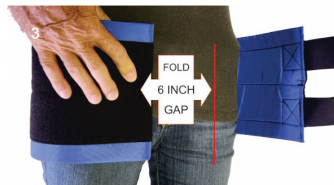
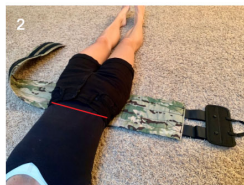
- Remove objects from patient's pockets and clothing prior to application.
- Monitor the patient's skin for pressure injury while in use.

1.) Locate one of the tear tabs on any of the four corners of the packaging. Tear package open, all the way across. Remove Pelvic Binder from vacuum sealed storage bag.

2.) Unroll and slide Pelvic Binder under supine patient. Center the Pelvic Binder over greater trochanters. Verify its placement carefully.

3.) Cut or fold back the free end of the binder to a length that allows for a 5-6 inch gap between the two edges when brought together.

4.) Lift the velcro plate across the patient's pelvis and place on the opposite side. Gently press velcro together to fully engage.



F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic



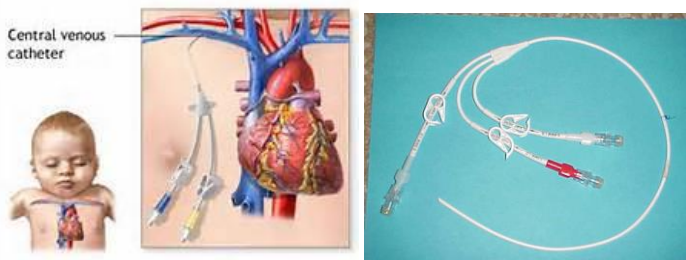
# Venous Access: Existing Catheters

## Clinical Indications:

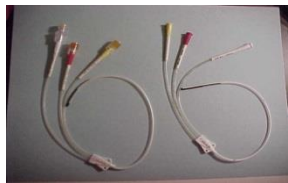
- Inability to obtain adequate peripheral access.
- Access of an existing venous catheter for medication or fluid administration.
- Central venous access in a patient in cardiac arrest.

## Procedure:

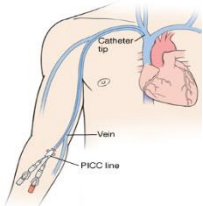
1. Clean the port of the catheter with alcohol wipe.
2. Using sterile technique, withdraw 5-10 mL of blood and discard syringe in sharps container.
3. Using **5 mL of Normal Saline** access the port with sterile technique and gently attempt to flush the saline.
4. If there is no resistance, no evidence of infiltration (e.g. no subcutaneous collection of fluid), and no pain experienced by the patient, proceed to step 5. 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).



The Broviac® catheter and the Hickman® catheter are temporary IV lines placed into a vein in the chest. The Broviac® is smaller than the Hickman® and therefore used for pediatric patients. These catheters are soft and come in double and triple lumens (as shown above).



The Groshong® catheter is similar to the Hickman but includes a valve at the tip of the catheter which reduces the amount of **Heparin** needed in the line. Used mainly for pediatric patients.



Peripherally inserted central catheter (PICC) is a 20-24 inch soft IV line which is inserted in the patient's arm and threaded into the heart. These catheters come in single or double lumens.

## 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 medical control.

# Venous Access: External Jugular

**Clinical Indications:**

- External jugular (EJ) vein cannulation is indicated in a critically ill patient greater than 12 years of age who requires intravenous (IV) access for fluid or medication administration and in whom an extremity vein is not obtainable.
- Consider intraosseus (IO) access in addition to or instead of an EJ attempt.

**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 skin with an antiseptic solution.
4. Align the catheter with the vein and aim toward the same side shoulder.
5. Compressing 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 medical control.

A	Advanced EMT
P	Paramedic

# Venous Access: Extremity

## Clinical Indications:

- Any patient where intravenous (IV) 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 provider.
- May use intraosseous (IO), External jugular (EJ), or preexisting venous catheter where threat to life exists and no obvious peripheral site is noted.
- Use the largest catheter bore necessary based upon the patient's condition and size of veins.
- Fluid and setup choice is preferably:
  - Normal Saline** with a macro drip (10 gtt/mL) for trauma or hypovolemia.
  - Normal Saline** with a macro drip (10 gtt/mL) for medical conditions, and
  - Normal Saline** with a micro drip (60 gtt/mL) 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.
- Upper extremity IV sites are preferable to lower extremity sites.
- Lower extremity IV sites are discouraged in patients with vascular disease or diabetes.
- In post-mastectomy patients, avoid IV, blood draw, injection, or blood pressure in arm on affected side.
- 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** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
- 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.
- All IV rates should be at KVO (minimal rate to keep vein open) unless administering fluid bolus.
- Consider a second IV line.
- Cover the site and secure the IV and tubing.
- 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 medical control.

A	Advanced EMT
P	Paramedic

# Venous Access: Intraosseus (Adult)

## Clinical Indications:

- Where rapid, regular intravenous (IV) access is unavailable with any of the following:
  - Cardiac arrest (may be used as a first line vascular access).
  - Multisystem trauma with severe hypovolemia.
  - Severe dehydration with vascular collapse and/or loss of consciousness.
  - Respiratory failure/respiratory arrest.
  - Require life-saving medications that cannot be administered intramuscular (IM) or subcutaneous (SQ).

## Contraindications:

- Fracture in bone or joint replacement of intraosseous (IO) site.
- Current or prior infection at proposed IO site.
- Previous IO insertion at proposed site within 48 hours.
- Inability to find landmarks.
- Prosthesis or previous orthopedic procedures near insertion site.

## Sites:

- Proximal humerus (preferred site, > 12 years of age)
  - Place the patient's palm on the umbilicus and elbow on the ground or stretcher or place the patient's arm flat on the ground or stretcher with the palm facing downward.
  - Use your thumb to identify humeral shaft, slide thumb towards humeral head with firm pressure. Locate tubercle by prominent bulge.
  - Use the opposite hand to pinch interior and anterior humerus ensuring that you are midline on the humerus. If necessary, for further confirmation, locate the inter-tubercular groove.
  - With your finger on the insertion site, keeping the arm adducted, externally rotate the humerus 90°. You may be able to feel the inter-tubercular groove.
  - Rotate the arm back to the original position for insertion. The insertion site is 1-2 cm lateral to the inter-tubercular groove.
- Proximal tibia
  - Identify the tibial tuberosity located 2 finger-breaths below the base of the patella.
  - The insertion site is 1-2 cm medial from this bony prominence on the superior portion of the flat aspect of the proximal tibia. Rotating the leg laterally can aid in positioning the site anterior.

## Procedure:

- Cleanse site using antiseptic agent and allow to air dry thoroughly.
- Prime the EZ-Connect extension set with approximately 1ml NS.
- Connect appropriate needle set to driver and stabilize site.
- Remove needle cap and position the driver at the insertion site with the needle set at a 90° angle to the bone surface.
- Gently pierce the skin with the needle tip until the tip touches the bone.
- The 5 mm mark must be visible above the skin for confirmation of adequate needle length.
- Gently drill into the bone and stop at loss of resistance.
  - Stop when you feel the "pop" or "give" in infants.
- Hold the hub in place and pull the driver straight off. Continue to hold the hub while twisting the stylet off the hub with counter clockwise rotations.
  - The needle should feel firmly seated in the bone (1<sup>st</sup> confirmation of placement).
- Place the stylet in a sharps container and secure site with EZ stabilizer and connect primed EZ-connect extension set to the hub, firmly secure by twisting clockwise.
- Flush the catheter with **5-10 mL Normal Saline** adults (**2-3 mL** pediatric); look for infiltration (2<sup>nd</sup> confirmation of placement).
  - If the patient is responsive to pain, administer **40 mg (2 mL) 2% Lidocaine, slow IO over 90 seconds** for anesthetic effect prior to the saline flush. May give an additional 20 mg for a max dose of 60 mg.
- Begin infusion utilizing a pressure delivery system and continue to monitor extremity for complications.
- Any prehospital fluids or medications approved for intravenous (IV) use may be given IO.
- Document the procedure, time, and result (success) on/with the patient care report (PCR).

## Additional Considerations:

- It is essential to perform a rapid normal saline (NS) syringe flush into the IO space before attempting to infuse fluids through the IO access. A rapid syringe flush of 5-10 mL normal saline in adults and 2-5 mL normal saline in infants and small children helps displace the marrow and fibrin in the medullary space, facilitating effective infusion rates.

## 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 medical control.

A	Advanced EMT
P	Paramedic

# Venous Access: Intraosseus (Pediatric, <12)

## Clinical Indications:

- Where rapid, regular intravenous (IV) access is unavailable with any of the following:
  - Cardiac arrest (may be used as a first line vascular access).
  - Multisystem trauma with severe hypovolemia.
  - Severe dehydration with vascular collapse and/or loss of consciousness.
  - Respiratory failure/respiratory arrest.
  - Require life-saving medications that cannot be administered intramuscular (IM) or subcutaneous (SQ).

## Contraindications:

- Fracture in bone or joint replacement of intraosseous (IO) site.
- Current or prior infection at proposed IO site.
- Previous IO insertion at proposed site within 48 hours.
- Inability to find landmarks.
- Prosthesis or previous orthopedic procedures near insertion site.

## Sites:

- Proximal tibia (<12 years of age)
  - Identify the tibial tuberosity located 2 finger-breaths below the base of the patella.
  - The insertion site is 1-2 cm medial from this bony prominence on the superior portion of the flat aspect of the proximal tibia. Rotating the leg laterally can aid in positioning the site anterior.
- Distal femur (<12 years of age)
  - Secure site with leg outstretched to ensure knee does not bend.
  - The insertion site is approximately 1-2 cm proximal to the superior border of the patella and approximately 1 cm medial to the mid-line (depending on patient anatomy).
  - Aim the needle set tip at a 90-degree angle to the bone for insertion.

## Procedure:

- Cleanse site using antiseptic agent and allow to air dry thoroughly.
- Prime the EZ-Connect extension set with approximately 1ml NS.
- Connect appropriate needle set to driver and stabilize site.
- Remove needle cap and position the driver at the insertion site with the needle set at a 90° angle to the bone surface.
- Gently pierce the skin with the needle tip until the tip touches the bone.
- The 5 mm mark must be visible above the skin for confirmation of adequate needle length.
- Gently drill into the bone and stop at loss of resistance.
  - Stop when you feel the "pop" or "give" in infants.
- Hold the hub in place and pull the driver straight off. Continue to hold the hub while twisting the stylet off the hub with counter clockwise rotations.
  - The needle should feel firmly seated in the bone (1<sup>st</sup> confirmation of placement).
- Place the stylet in a sharps container and secure site with EZ stabilizer and connect primed EZ-connect extension set to the hub, firmly secure by twisting clockwise.
- Flush the catheter with **2-3 mL Normal Saline** adults; look for infiltration (2<sup>nd</sup> confirmation of placement).
  - If the patient is responsive to pain, administer 0.5 mg/kg (max single dose 20 mg) 2% Lidocaine, slow IO over 90 seconds for anesthetic effect prior to the saline flush. May give an additional 0.5 mg/kg for a max total dose of 40 mg.
- Begin infusion utilizing a pressure delivery system and continue to monitor extremity for complications.
- Any prehospital fluids or medications approved for intravenous (IV) use may be given IO.
- Document the procedure, time, and result (success) on/with the patient care report (PCR).

## Additional Considerations:

- It is essential to perform a rapid normal saline (NS) syringe flush into the IO space before attempting to infuse fluids through the IO access. A rapid syringe flush of 5-10 mL normal saline in adults and 2-5 mL normal saline in infants and small children helps displace the marrow and fibrin in the medullary space, facilitating effective infusion rates.
- Adequate flow rates are dependent on performing a rapid normal saline flush (syringe bolus) prior to IO infusion and infusing fluids and medications under pressure (e.g. infusion pressure pump or pressure bag). Gravity alone will rarely generate adequate flow rates. An IV pressure bag capable of generating 300 mmHg pressure

## 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 medical control.

A	Advanced EMT
P	Paramedic

# Wound Care: Tazer Probe Removal

**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:**

1. Ensure wires are disconnected from the weapon.
2. Stabilize skin around probe using non-dominant hand.
3. Grasp probe by metal body using dominant hand.
4. Remove probe in single quick motion.
5. Wipe wound with antiseptic wipe and apply dressing.
6. 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 medical control.

B	EMT
A	Advanced EMT
P	Paramedic

# Standard Procedure (Skill)

## Wound Care: Tourniquet Use (CAT)

2.27

### Clinical Indications:

- Life threatening extremity hemorrhage that cannot be controlled by other means.
- Serious or life threatening extremity hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

### Contraindications:

- Non-extremity hemorrhage.
- Proximal extremity location where tourniquet application is not practical.

### Procedure:

1. Expose the extremity by removing clothing in proximity to the injury.
2. Place Combat application tourniquet® (CAT®) directly on the skin, 2-3 inches above the wound.
3. Route the self-adhering band around the extremity.
4. The band should be passed through the buckle and, then pull the band tight. The CAT® is delivered in the one-handed configuration with the band through the slit, and is the recommended storage configuration.
5. Pull the self-adhering band as tight as possible prior to trying to twist the windlass rod. This will reduce the number of turns needed to stop blood flow.
6. Twist the rod until bright red bleeding stops and no distal pulse is felt on the extremity.
7. Lock the rod in place with the clip and adhere any remaining band over the rod, inside the clip, and fully around the limb. Secure the rod and band with the white velcro strap on clip.
8. The tourniquet is effectively applied when there is cessation of a distal pulse and bleeding from the injured extremity, indicating total occlusion of arterial blood flow.
9. If hemorrhaging is still not controlled, consider additional tightening of the tourniquet or place a second CAT® side by side and proximal to the first and repeat the placement procedure.
10. Tourniquets should NOT be removed or loosened under prehospital care conditions. Doing so contributes to compartment syndrome.
11. Patient should have an identifying mark or tag indicating "TK" and the time of placement. Document application time on the white writeable tab on the CAT® and on your patient care report (PCR). Communicate time at transfer of care.
12. Document the procedure, time and result (success) on/with 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 medical control.

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic



# Standard Procedure (Skill)

## Wound Care: Wound Packing

2.28

### Clinical Indications:

- Life threatening hemorrhage that cannot be controlled by other means.
- Serious or life threatening extremity or junctional hemorrhage and tactical considerations prevent the use of standard hemorrhage control techniques.

### Contraindications:

- Chest or Abdominal wounds.

### Procedure:

1. Expose the wound site by removing clothing in proximity to the injury.
2. Removes excess blood from the wound while preserving any clots that may have formed. The provider identifies the source of the most active bleeding.
3. Removes the hemostatic agent or plain gauze from its package and packs it tightly into the wound directly over the site of the most active bleeding. More than one gauze roll may be required to control the hemorrhage.
4. Apply direct pressure over the wound and packing with enough force to stop the bleeding. The provider holds direct pressure for a minimum of 3 minutes (if using a hemostatic agent) or 10 minutes if using plain gauze.
5. After the required amount of time for application of direct pressure has elapsed, the provider reassesses for bleeding control. Additional packing may be placed as necessary to stop any continued bleeding.
6. Leave the wound packing in place and secure it in place with a pressure dressing or additional Kling.
7. Document the procedure, time and result (success) on/with 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 medical control.

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic



# Pain Management: Nitrous Oxide

**Clinical Indications:**

- Mild to severe pain
- Patient must be able to self-administer the medication (i.e. be alert and oriented and capable of following instructions)

**Contraindications:**

- Previous eye surgery within the last three months, known allergy, significant head or chest trauma, high clinical suspicion for pneumothorax, or bowel obstruction

**Procedure:**

1. Connect Nitrous Oxide cylinder to regulator and turn on valve
2. Connect the green O2 tubing to O2 supply line
3. Open cylinder and ensure there is sufficient gas pressure
4. Explain the procedure to the patient
  - This is a self-administered inhaled pain medication
  - Instruct the patient to place the mask over their face and take several deep breaths
  - Repeat as needed to achieve maximum pain relief
5. Monitor the patient's self-administration of Nitrous Oxide
  - Monitor patient's mental status and level of pain
  - Place waveform capnography on patient by nasal cannula
  - Patients may require transition to oxygen supplementation upon discontinuation
6. Document in patient care report (PCR)
  - Document patients pain before and after Nitrous Oxide administration

**Certification Requirements:**

- Maintain knowledge of the indications, contraindications, technique and complications associated with the administration of Nitrous Oxide. Assessment of the knowledge and skill competency associated with this procedure may be accomplished via quality assurance, classroom demonstrations, skills competency stations or other mechanism as deemed appropriate.
- Nitrous Oxide may be administered by AEMT's and Paramedics, however, preference will be given to units where AEMT's are working as they do not have the same medication options as our Paramedics.

B	EMT
A	Advanced EMT
P	Paramedic

# Standard Procedure (Skill)

## Blood Administration

2.30

### Clinical Indications:

- Any patient where Blood Product Administration is indicated in the blood administration guideline, or where as ordered by a Physician.

### Procedure:

- Large bore IV or IO access available, 2 preferred.
- Prepare blood warmer. Connect heater to battery and turn on device.
- Remove Units from storage to be administered. TWO providers must cross check and confirm transfusion is required prior to administration.
  - Verify Blood Component is correct
  - Verify Expiration Date
  - Confirm Temperature monitor in each unit is not red
  - Check for discoloration or gas bubbles present
  - Check and document patient temperature**
- If patient has apparent capacity and condition allows, discuss the procedure with the patient and obtain verbal consent.
- Connect warmer to the disposable warming set and attach preflushed blood administration set.
  - All Pre-Hospital blood products should be warmed during administration.
    - In the case of major events, such as MCI's, or when >4 units are needed, unwarmed blood products may be administered.
  - Interfacility blood administration does not have to be warmed
- Once indicator light on warmer shows GREEN, infuse blood wide open.
- Administer blood products using pressure bag.
- Monitor for transfusion reactions during the next 15 minutes.
  - Second temperature must be taken at this time**
    - If a reaction occurs, STOP infusion and follow appropriate guideline. Retain all blood product and tubing for source testing.
- Document the procedure, time, and results:**
  - Blood product type, expiration date, and lot number MUST be documented for EACH blood product unit administered.
  - Patient temperature must be documented prior to and 15 minutes after initiation of blood product administration.**
  - Blood bank paperwork must be completed with the yellow form given to the receiving staff at transfer of patient care.

**\*\*Online medical control order must be obtained prior to  
FEMALE PATIENT < 50 Y/O RECEIVING O+ WHOLE BLOOD,  
all PEDIATRIC, and ALL NON-TRAUMA MEDICAL PATIENTS\*\***

CCP

Critical Care Paramedic

# Airway: Surgical (Cricothyrotomy)

## Clinical Indications:

- Adult failed airway from significant upper airway/facial trauma or medical issue.
- Management of an airway when standard airway procedures fail.  
Inability to place any other device thus resulting in inadequate ventilation in a patient equal to or greater than 12 years old.

## Procedure: Control-Cric<sup>TM</sup>

1. Position the patient supine and identify the cricothyroid membrane.
2. Stabilize the larynx with thumb and middle finger with the non-dominant hand.
3. Utilizing the Cric-Knife<sup>TM</sup>, incise the skin making a vertical incision from the mid-thyroid cartilage to the cricoid cartilage (about 2 finger breadths in length). A longer incision may be needed if the patient has a thick neck. If landmarks are clearly visible, a horizontal incision may be used.
4. After palpating the cricothyroid membrane, turn the Cric-Knife<sup>TM</sup> to a horizontal position over the cricothyroid membrane.
5. Push the blade downward, perpendicular to the trachea, until the blade is fully inserted and the airway is entered.
6. While maintaining a downward force, slide the tracheal hook down the handle with your thumb until the hook is felt to enter the trachea, and disengages from the handle.
7. Grab the hook with the non-dominant hand, lifting up on the thyroid cartilage.
8. Insert the Cric-Key<sup>TM</sup> through the incision. Placement can be confirmed by moving the device along the anterior wall of the trachea to feel for the tracheal rings. Tenting of the skin, difficulty advancing the Cric-Key<sup>TM</sup>, or lack of tactile feedback from the tracheal rings suggests incorrect placement.
9. Once placement has been confirmed, advance the Cric-Key<sup>TM</sup> to the flange. Stabilize the Cric-Key<sup>TM</sup> tube and pivot the tracheal hook toward the patient's shoulder to remove from the airway.
10. While stabilizing the Cric-Key<sup>TM</sup> tube, remove the Cric-Key<sup>TM</sup> introducer. Inflate the cuff until resistance is met.
11. Confirm proper placement of the airway device utilizing standard methods (presence of breath sounds, absence of gastric sounds) and quantitative waveform capnography (a colorimetric EtCO<sub>2</sub> device may be used for initial confirmation of placement if waveform capnography is not immediately available).
12. Secure the device with the stabilizing strap and airway device in place and provide standard care for the intubated patient.
13. Document this procedure, time, and result (success) on/with the patient care report
14. **It is required that the airway be monitored continuously through waveform capnography and pulse oximetry as soon as available.**

**An airway confirmation must be documented in the EPCR.**

## Certification Requirements:

- **THIS PROTOCOL IS FOR THOSE PARAMEDICS EXPRESSLY APPROVED BY MD. LUTZ TO PERFORM THIS SKILL. NO OTHER PARAMEDIC CAN PERFORM THIS SKILL EVEN WITH DIRECTION FROM ON-LINE MEDICAL CONTROL.**
- 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 Medical Control.

# Special Team Procedures (Skills)

## Wound Care: Eye Irrigation

3.2

### Clinical Indications:

- Irrigation for eye injuries prior to and during transport.

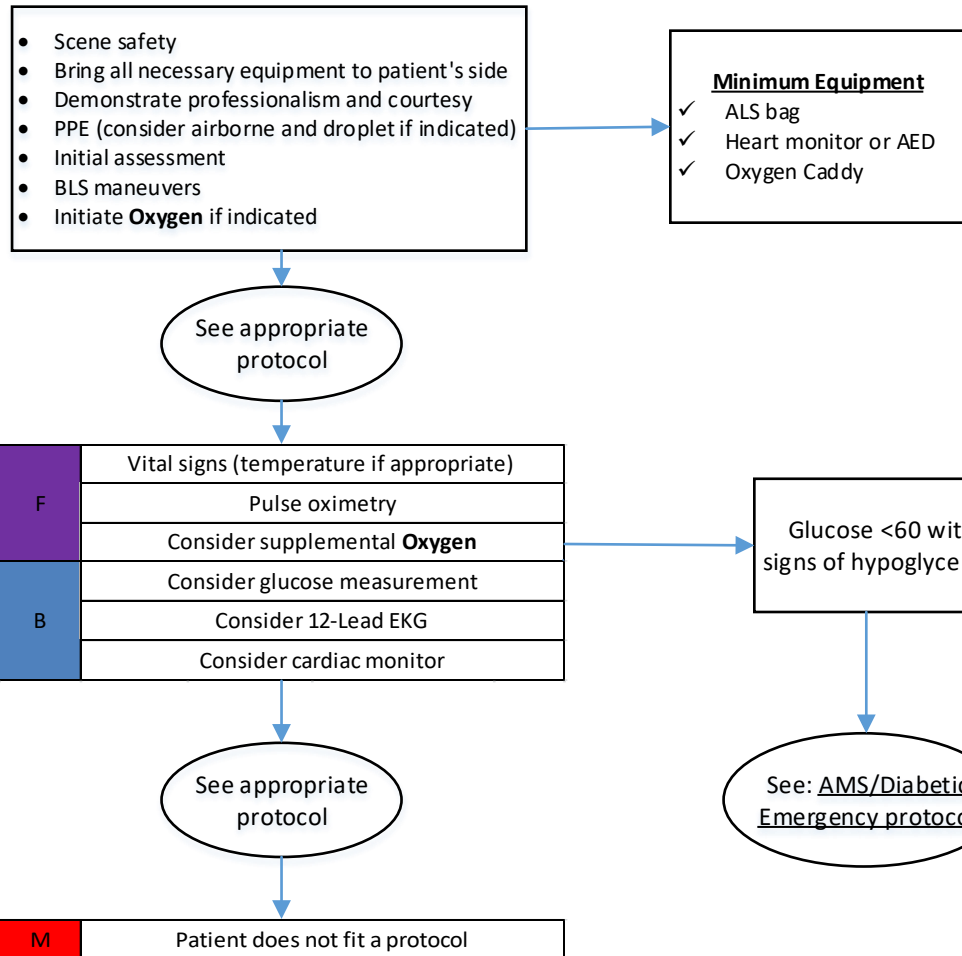
### Irrigation Guidelines and Procedures:

- For chemical splashes to the eye, emergent irrigation is critical to preventing further tissue damage. If there is no concern for physical trauma to the eye, utilize a Morgan Lens® to immediately provide copious irrigation directly to the globe. Have patient remove contact lenses. Follow the **Eye Injury/Complaint Protocol**.
- To utilize the Morgan Lens®, follow these steps:
  - Apply topical ocular anesthetic (e.g., 2 drops **Tetracaine**).
  - Attach Morgan Lens® set to IV tubing to sterile solution (e.g., saline bag); **START FLOW**.
  - Have patient look down, retract upper lid, and insert Morgan Lens® under upper lid.
  - Have patient look up, retract lower lid, and then gently drop lens in place.
  - Release lower lid over lens and ensure steady, copious flow. Secure tubing to prevent accidental lens removal. Absorb outflow with towels. **DO NOT RUN DRY**.
  - Irrigate with at least one liter of sterile solution. For lens removal, **ENSURE FLOW OF SOLUTION IS CONTINUING**, have patient look up, retract lower lid (and upper lid slightly if necessary), and slide Morgan Lens® out. Stop flow only after removing lens.
- Document the procedure, including solution and volume used to irrigate, 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 Greenville County EMS system.

F	First Responder
B	EMT
A	Advanced EMT
P	Paramedic
M	Medical Control
SO	Special Operations

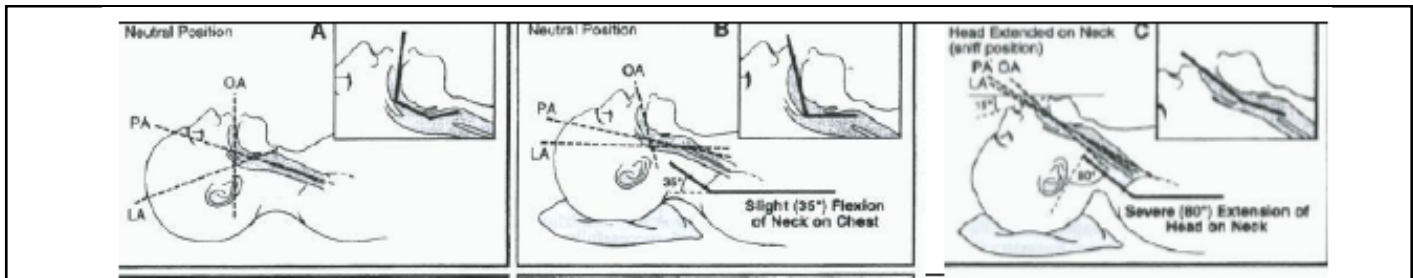
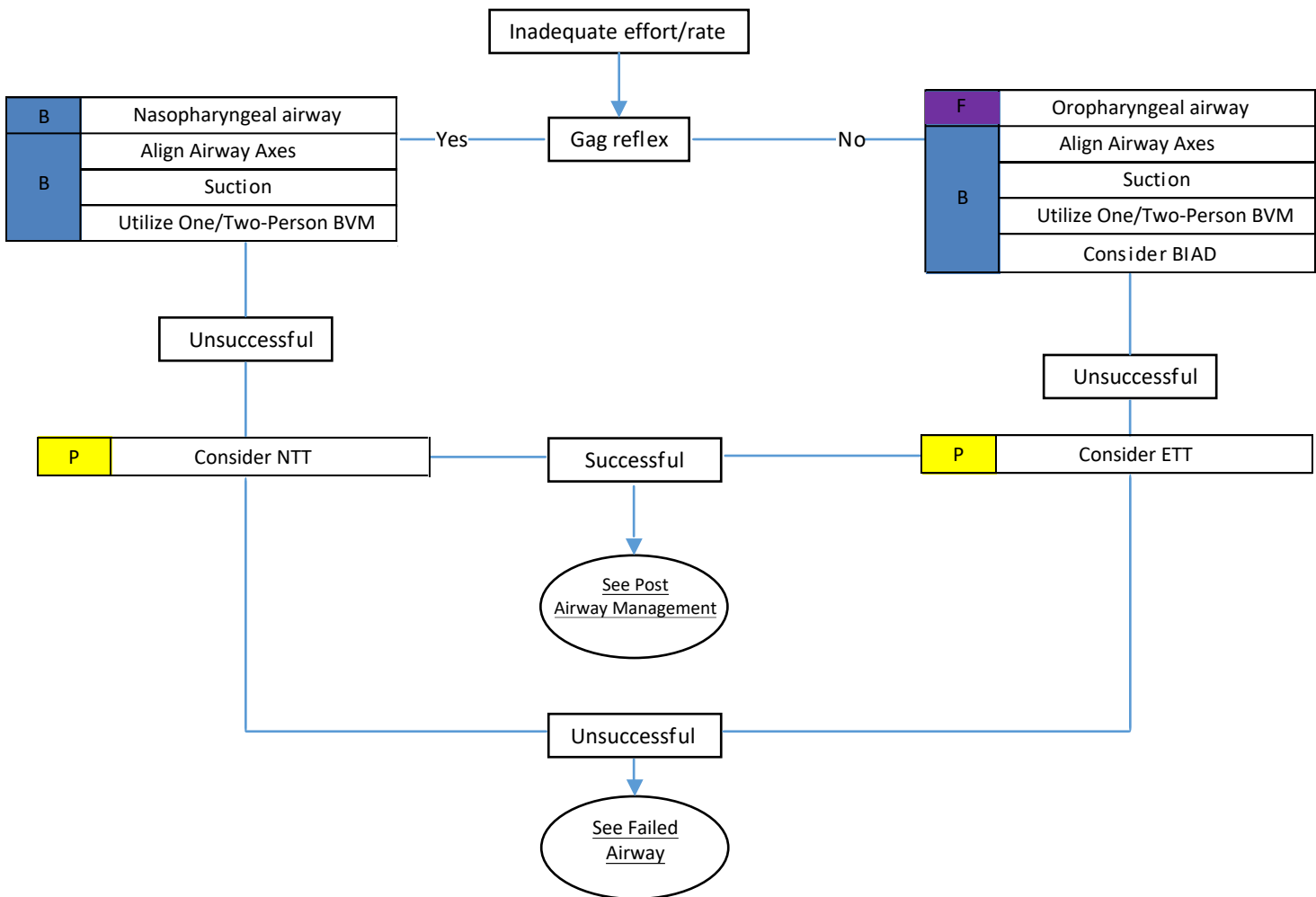


**Patient Definition:** A patient is defined as any person who meets any of the following criteria:

- Receives basic or advanced medical/trauma treatment
- Is physically examined
- Has visible signs of injury or illness or has a medical complaint
- Requires EMS assistance to change locations and/or position
- Identified by anyone as a possible patient because of some known, or reasonably suspected illness or injury
- Has a personal medical device evaluated or manipulated by EMS
- Requests EMS assistance with the administration of personal medications or treatments

**PEARLS:**

- **Any patient contact which does not result in an EMS transport must have a completed refusal.**
- **Required vital signs on every patient include blood pressure, heart rate, respirations, pain/severity.**
- **Pulse oximetry and temperature documentation is dependent on the specific complaint.**
- **A pediatric patient is defined as 1 day to less than age 12 or less than 55 kgs in ages 12-18.**
- Timing of transport should be based on patient's clinical condition and the transport policy.
- Appropriate care should be performed where the patient is found, unless the scene is unsafe or rapid transport is indicated (ie: STEMI, CVA, trauma).
- **Never hesitate to contact Medical Control for a patient who refuses transport.**
- Each patient should have at least one full set of vital signs taken manually and not obtained by the monitor. Additionally there should be at least one set of vital signs recorded for every 15 minutes of patient contact time.
- Continuous waveform capnography should be monitored with the administration of all controlled substances.
- Orthostatic vital sign procedure should be performed in situations where volume status is in question.



## PEARLS:

- BIAD is the preferred airway with patients in cardiac arrest. Deviation from this requires justification in PCR.
- Capnometry or capnography is mandatory with all methods of advanced airway management with appropriate documentation.
- An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth or inserted into the nasal passage.
- Ventilatory rate/minute should be 30 for neonates, 25 for toddlers, 20 for school age, and 8-24 for adolescents and adults. Maintain a EtCO<sub>2</sub> between 35 and 45 and avoid hyperventilation.
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Position patient properly for airway management, refer to illustration above. If patient is located on stretcher, the head of the stretcher may be elevated to align airway axes.
- Hyperventilation in deteriorating head trauma should only be done to maintain an EtCO<sub>2</sub> of 35-40 mm HG.
- Obese adults (greater than 120 kg) may desaturate quickly.
- It is important to secure the ETT well and consider c-collar to better maintain ETT placement.
- **PEEP Valves** must be utilized on BVM devices for adult patients:
  - **PEEP Valve Adult Patient Relative Contraindications:** Hypovolemia, Chest trauma, suspected pneumothorax
  - **PEEP Valve Considerations:**
    - Set PEEP to 5 cm H<sub>2</sub>O. Consider increasing PEEP to 10 cm H<sub>2</sub>O, if SPO<sub>2</sub> is less than 92% after 2 minutes of ventilation with no relative contraindications.
    - Can be uncomfortable for the awake patient.
    - Monitor airway pressures using manometer and ensure correct PEEP settings.

# Adult Airway: MFI/RSI

5.2A

## Indications:

- **Age 12 or greater**
- Trauma with GCS  $\leq 9$  with gag reflex
- Trauma with significant facial trauma and poor airway control
- Closed head injury or major stroke with unconsciousness
- Acute burn with airway involvement and inevitable airway loss
- Respiratory exhaustion such as severe asthma, CHF or COPD with hypoxia
- Overdose with AMS where loss of airway is inevitable

## Difficult Airway Assessment:

- **H:** Hypoxaemia
- **E:** Extremes of size
- **A:** Anatomic challenges
- **V:** Vomit, blood, fluid
- **E:** Exsanguination
- **N:** Neck Mobility

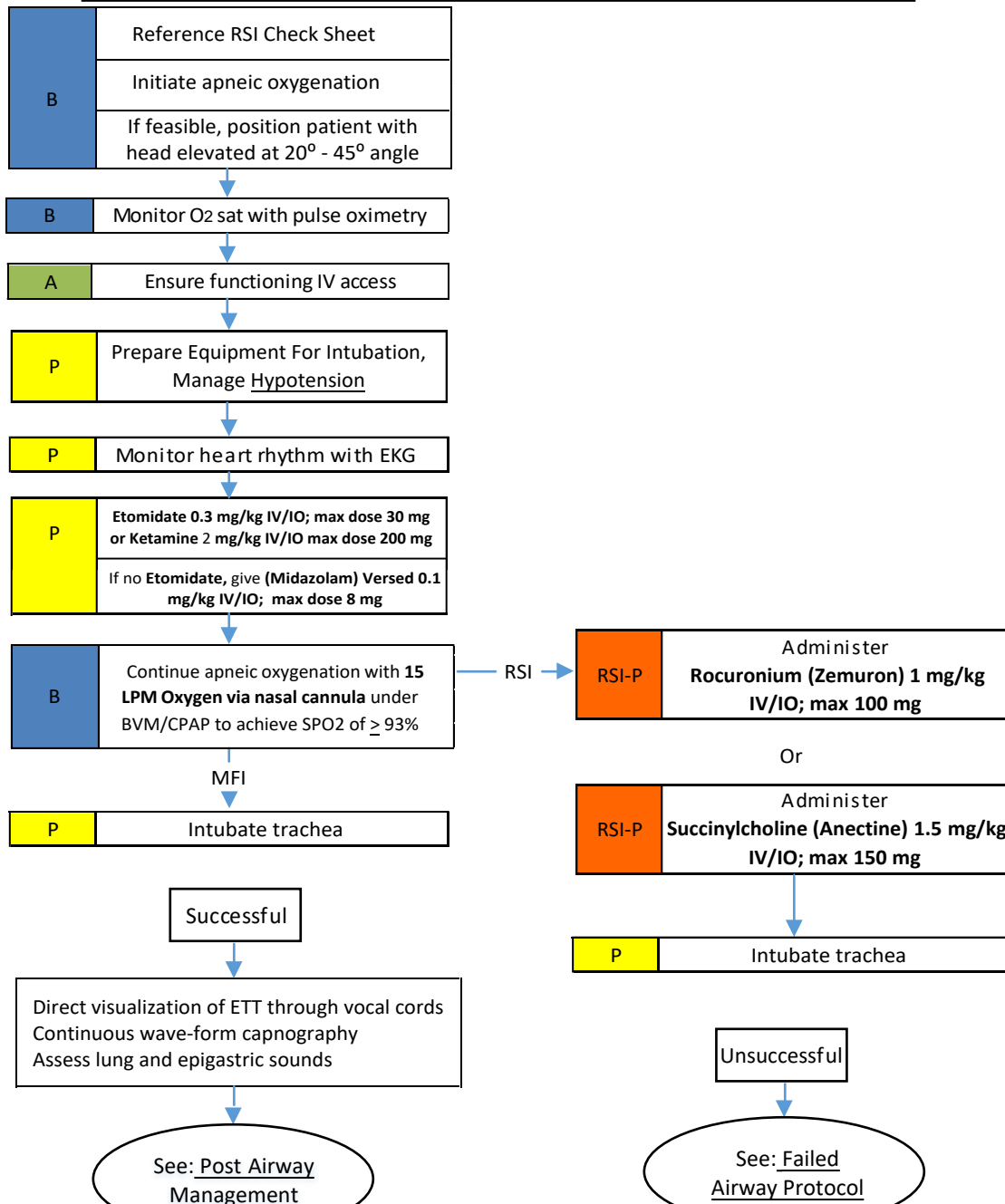
## Difficult BIAD Assessment:

- Restricted opening
- Obstruction
- Distorted airway
- Stiff lungs or c-spine

## Contraindications:

- **Age Less than 12**
- Difficulty ventilating patients with BVM
- Anticipated difficult intubation based on physical exam of airway structures or airway history.

A minimum of two Paramedics on scene prior to sedation



Airway

## Ketamine Dosing

2 mg/kg IV/IO, Max dose 200 mg

Use in patients with hypotension and reactive airway disease.

## Etomidate Dosing

0.3 mg/kg IV/IO, Max dose 30 mg

Use in patients with significant hypertension.

## Rocuronium Dosing

1.0 mg/kg IV/IO, Max dose 100 mg

Review contraindications in PEARLS

## Succinycholine Dosing

1.5 mg/kg IV/IO, Max dose 150 mg

### PEARLS:

- Utilize Handtevy for drug dosing.
- If dangerously combative and in need of advanced airway, see **COG 5.2C** to consider DSI.
- Intubation equipment includes: intubation kit, Bougie®, BVM, suction, BIAD, waveform capnography.
- Succinycholine:**
  - Contraindications include: Known renal failure patients with missed dialysis, known hyperkalemia, known neuromuscular disease: (myasthenia gravis, amyotrophic lateral sclerosis, muscular dystrophy), significant burns greater than 4 days old, Guillain-Barre syndrome, patient or family history of malignant hyperthermia. As a result these patients may not undergo RSI with Succinycholine.
- Patients with hypoxia and/or hypotension are at risk of cardiac arrest when a sedative and paralytic medication are administered. Hypoxia and hypotension require resuscitation and correction prior to use of these combined agents.
- All appropriate measures must be taken to attempt to increase O<sub>2</sub> saturation to greater than or equal to 93% prior to intubation.
- MFI should be utilized for patients with an immediate airway management need but by rendering apneic (paralytics) could be catastrophic for the patient.
- First pass attempt with video laryngoscopy is strongly encouraged.
- There is a possibility of laryngospasm with high dose Ketamine administration. Consider the Larson's maneuver for management.
- Bradycardia after tube placement is a strong predictor of a misplaced endotracheal tube (ETT).
- Capnography:** Is required for all advanced airway devices.
  - Should BIAD be confirmed with capnometry by first responder immediately switch to capnography upon arrival.
  - If waveform capnography loss (flatline) remove advanced airway and refer to Failed Airway Protocol.
  - If waveform capnography is replaced by a dashed line, immediately visualize correct placement of ETT. Once ETT is visualized and confirmed, make necessary equipment adjustments.
- An airway confirmation signature must be obtained on every patient who receives drug assisted intubation (RSI or MFI).**



# Adult Airway: MFI/DSI

5.2C

## Indications:

- **Age 12 or greater**
- Trauma with GCS  $\leq 9$  with gag reflex
- Trauma with significant facial trauma and poor airway control
- Closed head injury or major stroke with unconsciousness
- Acute burn with airway involvement and inevitable airway loss
- Respiratory exhaustion such as severe asthma, CHF or COPD with hypoxia
- Overdose with AMS where loss of airway is inevitable

## Difficult Airway Assessment:

- **H:** Hypoxaemia
- **E:** Extremes of size
- **A:** Anatomic challenges
- **V:** Vomit, blood, fluid
- **E:** Exsanguination
- **N:** Neck Mobility

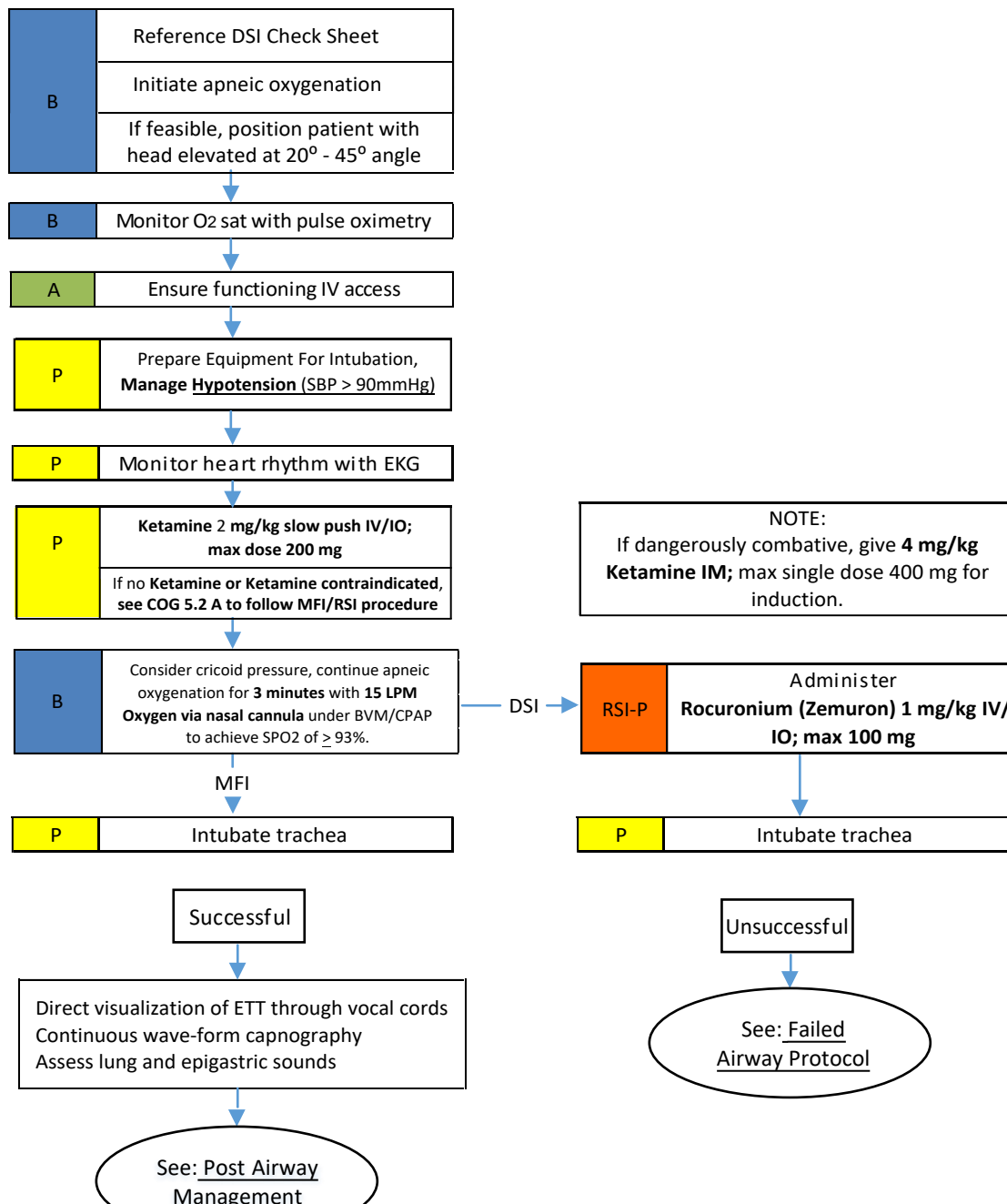
## Difficult BIAD Assessment:

- Restricted opening
- Obstruction
- Distorted airway
- Stiff lungs or c-spine

## Contraindications:

- **Age Less than 12**
- Difficulty ventilating patients with BVM
- Anticipated difficult intubation based on physical exam of airway structures or airway history.
- Any contraindication to the use of **Ketamine** (SBP  $>210$  or  $>110$  Diastolic).

A minimum of two Paramedics on scene prior to sedation



Airway

## Ketamine Dosing

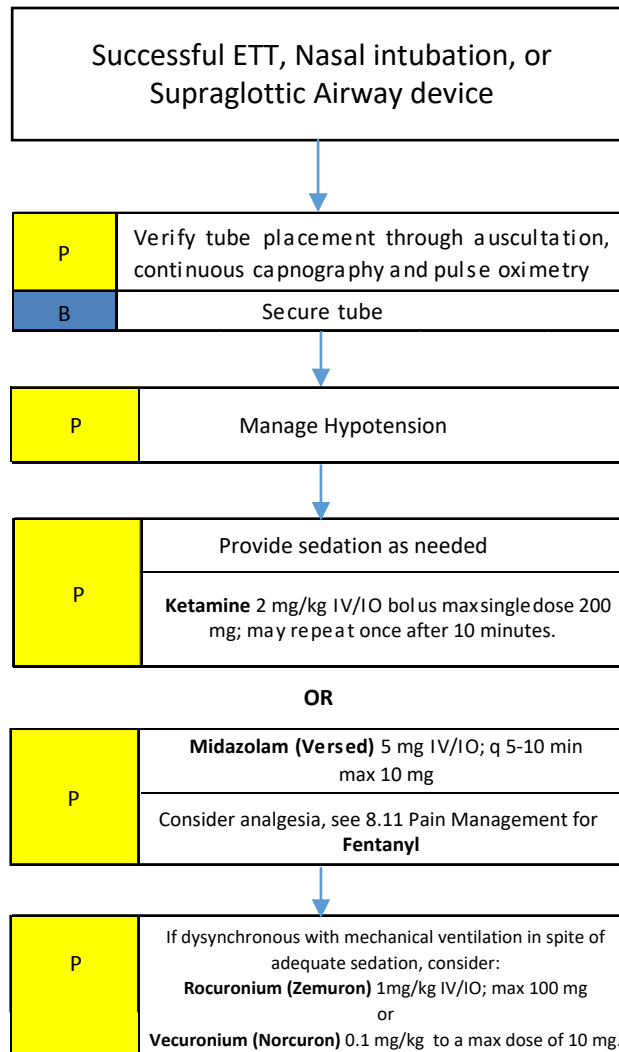
2 mg/kg IV/IO, Max dose 200 mg

## Rocuronium Dosing

1.0 mg/kg IV/IO, Max dose 100 mg

### PEARLS:

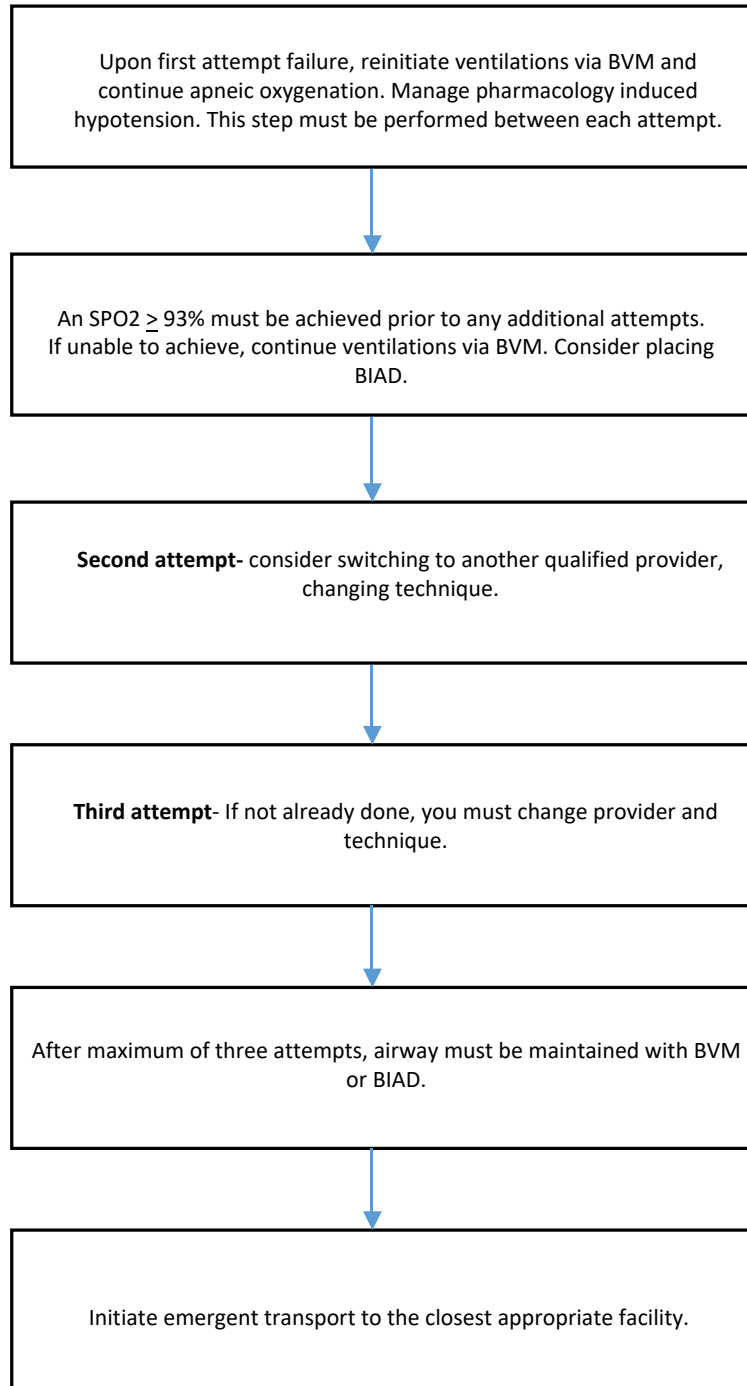
- Utilize Handtevy for drug dosing.
- Delayed Sequence Intubation (DSI) is the preferred intubation procedure in patient's that require advance airway management where emergent rapid sequence intubation (RSI) would be otherwise unsafe due to risk of severe hypoxia.
- DSI provides controlled sedation to achieve adequate preoxygenation and denitrogenation in the patient intolerant of desaturating.
- CPAP with high flow NC can be used for apneic oxygenation after Ketamine administration if patient's oxygen saturation is improving and the patient has a good respiratory effort. If concerns with the patient's respiratory effort or rate, switch to high flow NC with BVM.
- If dangerously combative and in need of advanced airway, see **COG 8.4 Behavioral Emergencies** for IM Ketamine 4 mg/kg; max 400 mg for induction agent.
- Intubation equipment includes: intubation kit, Bougie®, BVM, suction, BIAD, waveform capnography.
- Patients with hypoxia and/or hypotension are at risk of cardiac arrest when a sedative and paralytic medication are administered. Hypoxia and hypotension require resuscitation and correction prior to use of these combined agents.
- All appropriate measures must be taken to attempt to increase O<sub>2</sub> saturation to greater than or equal to 93% prior to intubation.
- MFI should be utilized for patients with an immediate airway management need but by rendering apneic (paralytics) could be catastrophic for the patient.
- First pass attempt with video laryngoscopy is strongly encouraged.
- There is a possibility of laryngospasm with high dose Ketamine administration. Consider the Larson's maneuver for management.
- Bradycardia after tube placement is a strong predictor of a misplaced endotracheal tube (ETT).
- **Capnography:** Is required for all advanced airway devices.
  - Should BIAD be confirmed with capnometry by first responder immediately switch to capnography upon arrival.
  - If waveform capnography loss (flatline) remove advanced airway and refer to Failed Airway Protocol.
  - If waveform capnography is replaced by a dashed line, immediately visualize correct placement of ETT. Once ETT is visualized and confirmed, make necessary equipment adjustments.
- **An airway confirmation signature must be obtained on every patient who receives drug assisted intubation (MFI, RSI, DSI).**



Notify receiving facility or contact Medical Control

## PEARLS:

- Utilize Handtevy for drug dosing.
- **Etiology of hypotension post intubation:** Tension pneumothorax, Hyperventilation, Hypovolemia, medication induced, or shock.
- **Ketamine** should be used for sedation in the presence of hypotension.
- Waveform capnography and pulse oximetry must be utilized for a minimum of 5 minutes after tube placement prior to the administration of **Rocuronium (Zemuron)** or **Vecuronium (Norcuron)** and is required for intubation verification and ongoing patient monitoring.
- Bradycardia after tube placement is a strong predictor of a misplaced endotracheal tube (ETT).
- It is required that the airway be monitored continuously through waveform capnography and pulse oximetry.
- An airway evaluation form must be completed on every patient who receives advanced airway management
- Confirm airway placement by ED staff prior to moving the patient from EMS stretcher..



Notify receiving facility or contact Medical Control

## PEARLS:

- If first intubation attempt fails, make adjustment and then consider:
  - Different laryngoscope blade
  - Gum Elastic Bougie
  - Different ETT side
  - Change cricoid pressure
  - Apply BURP maneuver (Push trachea Back (posterior), Up, and to patient's right)
  - Change head positioning
  - Consider utilizing SALAD technique
- Continuous pulse oximetry should be utilized in all patients with an inadequate respiratory function.
- Notify Medical Control early about the patient's difficult/failed airway.
- If airway is secured at any point during this protocol, see Post Airway Management.

## History:

- Age  $\geq 18$
- Past medical history
  - MI
  - Angina
  - Diabetes
  - Post menopausal
- Medications
- **Erectile dysfunction medications**
- Recent physical exertion
- Palliation/Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region/Radiation/Referred
- Severity (1-10)
- Time (Onset/duration/repetition)

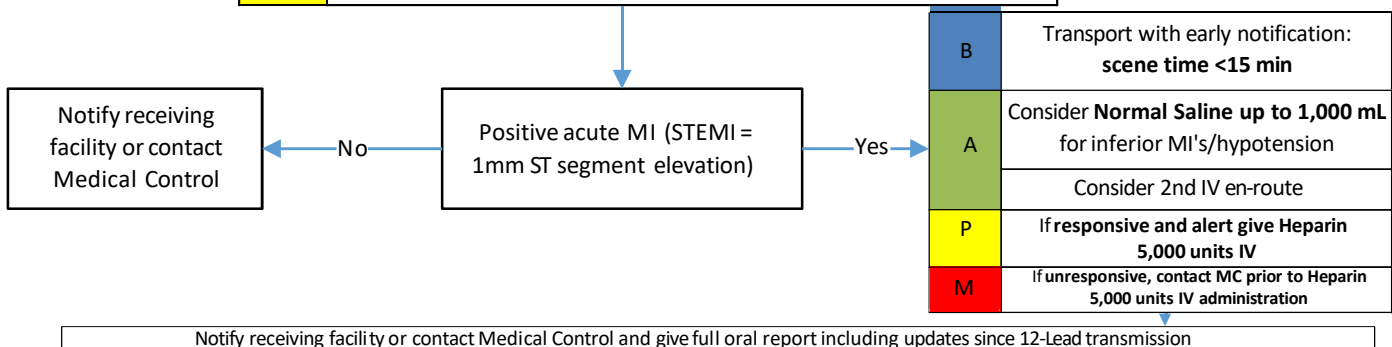
## Significant Findings:

- Chest pain/pressure/aching/ tightness
- Location
  - Substernal
  - Epigastric
  - Arm
  - Jaw
  - Neck
  - Shoulder
- Radiation of pain
- Pale/diaphoretic
- Shortness of breath
- Nausea/vomiting
- Dizziness
- Time of onset

## Differential:

- Trauma/medical
- Angina/MI
- Pericarditis
- Pulmonary embolism
- Asthma/COPD
- Pneumothorax
- Aortic dissection/aneurysm
- GI reflux/hiatal hernia
- Esophageal spasm
- Chest wall injury/pain
- Pleural pain
- OD (cocaine/methamphetamine)

F	Oxygen to maintain an O <sub>2</sub> sat of 94%-99%
B	12-Lead EKG (within 5 min of arrival); BLS must transmit 12-Leads for physician interpretation
	Aspirin 324 mg PO
A	Initiate IV
B	Nitroglycerin 0.4 mg SL; repeat every 5 min (See PEARLS)
	Consider Nitroglycerin Paste 1 gram/1 inch
P	Consider Zofran (Ondansetron) 4 mg IV/IM; may repeat once
	If SBP > 100 consider Morphine 2 mg IV increments for pain relief; Max 10 mg or Fentanyl 2 mcg/kg slow IV, repeat once in 5 minutes. Max single dose 100mcg.



## PEARLS:

- Avoid Nitroglycerin in any patient who has used erectile dysfunction medication (i.e., Viagra or Levitra within 24 hrs; or Cialis within 36 hrs) due to potential severe hypotension.
- ACS in the presence of other etiology such as CVA or trauma: **DO NOT administer Aspirin or Heparin. Contact Medical Control.**
- Nitroglycerin may be repeated at 5-min intervals until pain is relieved (no maximum as long as systolic blood pressure stays above 90).
- Systolic blood pressure must be greater than **100** for Nitroglycerin administration if 12 lead EKG and peripheral IV are not available. Blood Pressure must be obtained again prior to additional administration of Nitroglycerin.
- Heparin must be **withheld** if any physical or possible signs of trauma are found. Contact Medical Control.
- Perform a right sided 12-Lead if the patient has an identified inferior MI, or if a right ventricular MI is suspected.
- Consider Nitroglycerin Paste, 1 gram/1 inch, after 3 SL Nitroglycerin have been administered. Check blood pressure every 5 min.
- Zofran (Ondansetron) can cause QRS widening.
- **STEMI protocol is for patients older than 18 years old; if under 18 year old, contact Medical Control.**
- A STEMI cannot be called in the presence of a paced rhythm or a LBBB unless the LBBB is new.
- STEMI's typically don't go fast. Consider alternative causes if the heart rate is greater than or equal to 120 beats per minute.
- Patients with STEMI's should be transported to a PCI capable hospital. Place defib pads on patient and place in a gown if time permits.
- Diabetics and geriatric patients often have atypical pain (i.e., back pain) or only generalized complaints when having a STEMI.
- Patients short of breath should be administered high flow Oxygen regardless of O<sub>2</sub> saturation.
- Once a 12 lead has been placed in the presence of a Paramedic, an ALS provider becomes the primary attendant regardless of the EKG findings.

## History:

- Past medical history
- Medications
  - Beta blockers
  - Clonidine
  - Calcium channel blockers
  - Digoxin
- Pacemaker

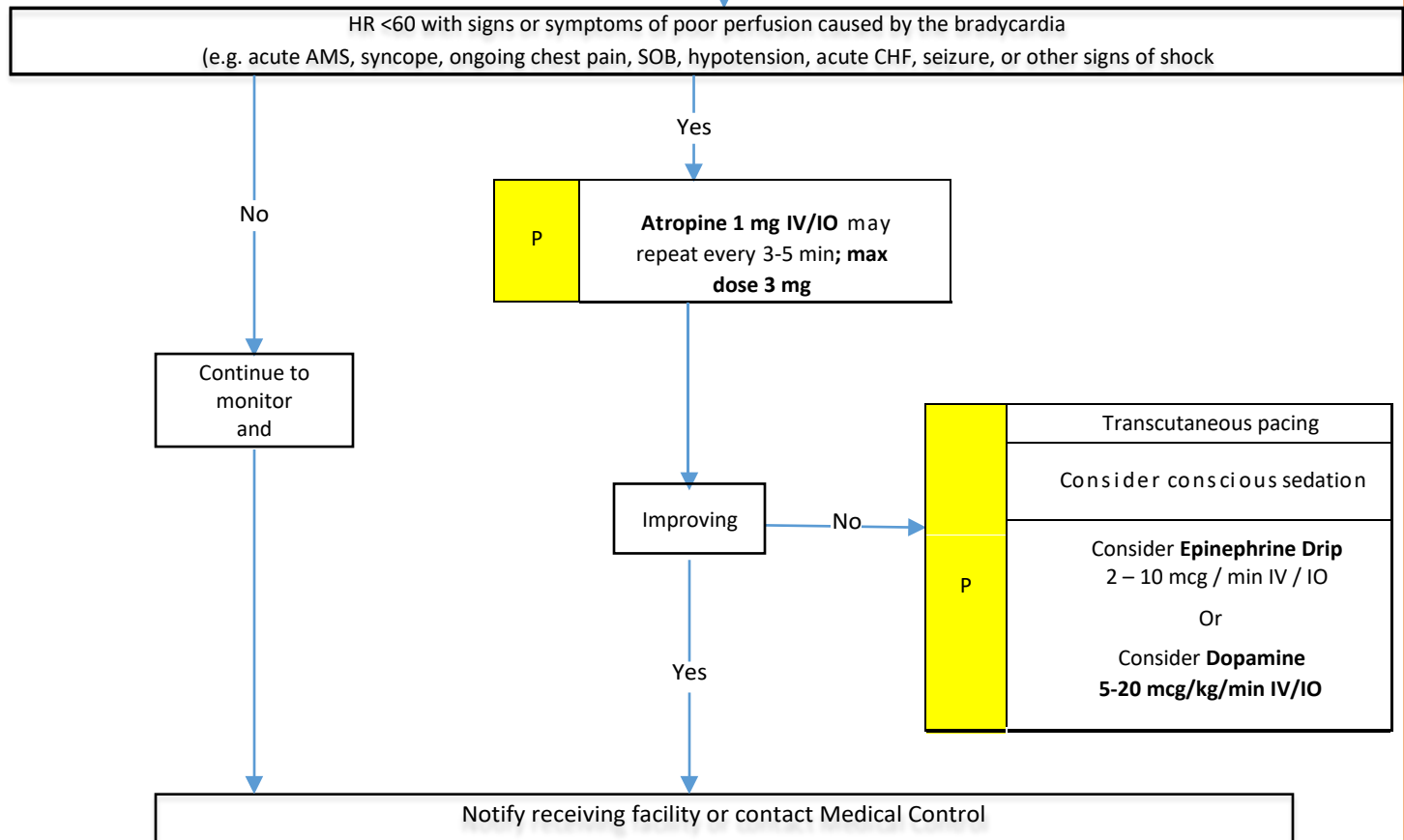
## Significant findings:

- HR <60
- Acute CHF
- Seizures
- Chest pain
- Respiratory distress
- Hypotension or shock secondary to bradycardia
- Acute altered mental status
- Syncope

## Differential:

- Acute MI
- Hypoxia
- Pacemaker failure
- Hypothermia
- Athletes
- Head injury (elevated ICP)
- Stroke
- Spinal cord lesion
- AV blocks (1st°, 2nd°, or 3rd°)
- Overdose

F	Oxygen
B	12-Lead EKG
A	Initiate IV/IO



## PEARLS:

- If bradycardic patient is also a STEMI, follow the STEMI guidelines.
- For transcutaneous pacing set rate for 70 beats per minute. Increase current (mA) until electrical and mechanical capture occur or pacing current reaches (200 mA).
- For Conscious sedation, see Sedation/Anxiety protocol. Dose should be titrated to provide comfort without causing unconsciousness or respiratory failure. Be sure to monitor patient's breathing/ventilations, blood pressure and O2 saturation.
- **Pacing can be considered first for critical patients in the presence of 2nd° or 3rd° heart block.**
- Atropine will not work on a heart transplant patient. Transcutaneous pacing and/or Epinephrine drip is indicated.
- Consider **Glucagon (GlucaGen) 2 mg IV/IO** if patient is still bradycardic and on beta blockers.
- Consider **Calcium Gluconate (Kalcinate) 5-20 mL IV/IO** if patient is still bradycardic and on calcium channel blockers.
- **The use of Lidocaine (Xylocaine), Amiodarone (Cordarone) and calcium channel blockers in heart block can worsen bradycardia and lead to death.**
- In wide complex slow rhythm, consider hyperkalemia.

## History:

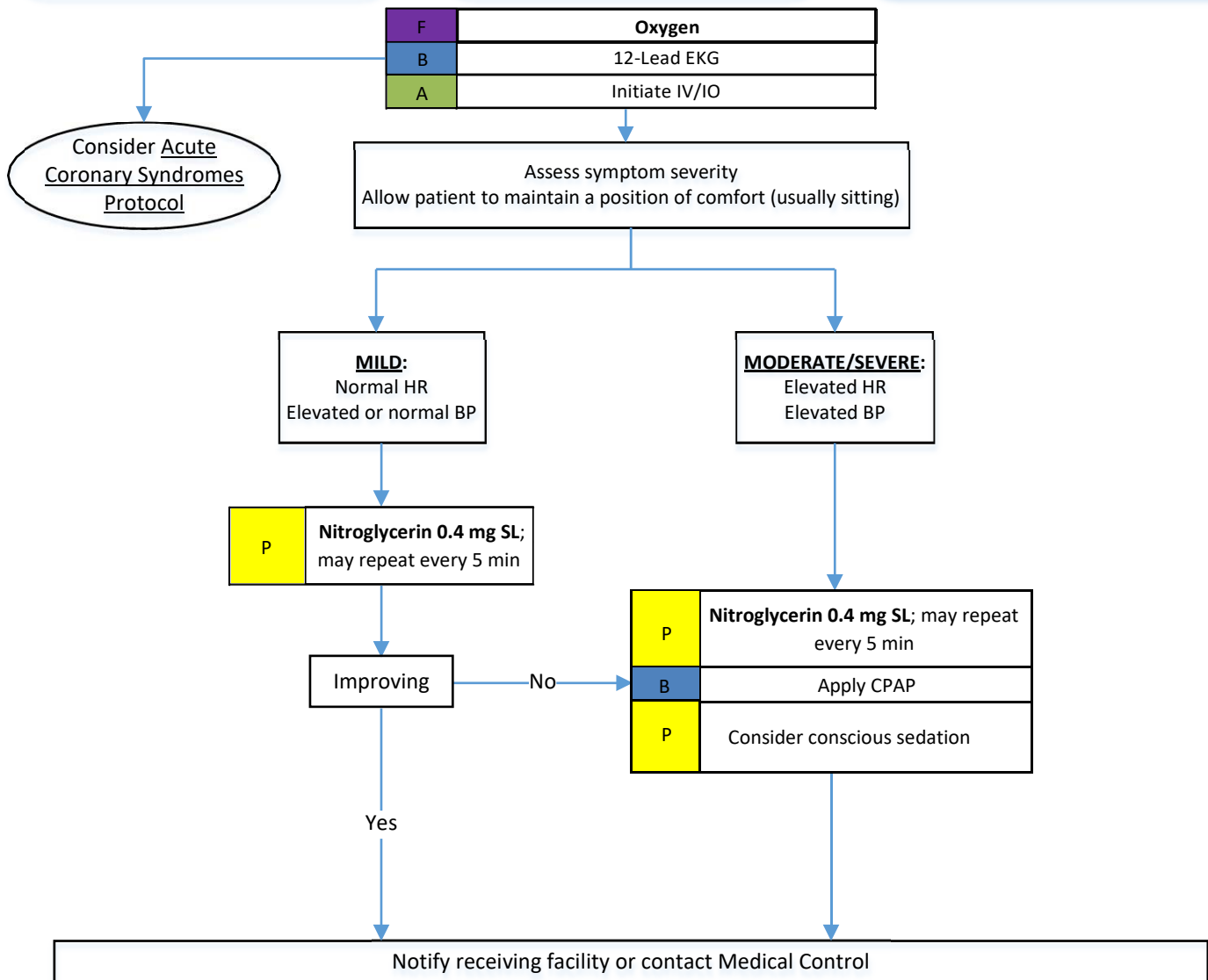
- CHF
- Past medical history
- Medications (Digoxin, Lasix)
- Erectile dysfunction medication
- Cardiac history (MI)

## Significant findings:

- Severe SOB
- Diaphoresis
- Tachycardia
- Elevated blood pressure
- Peripheral edema
- Pink, frothy sputum
- Bi-lateral rales
- Air hunger
- Tachypnea
- Chest pain

## Differentials:

- MI
- COPD
- Anaphylaxis
- Aspiration
- Pleural effusion
- Pericardial tamponade
- Toxic exposure
- CHF
- Asthma
- PE
- Pneumonia



## PEARLS:

- Avoid Nitroglycerin in any patient who has used erectile dysfunction medication (i.e., Viagra or Levitra within 24 hrs., or Cialis within 36 hrs.) due to potential severe hypotension.
- For administration of Nitroglycerin, systolic blood pressure must be greater than 90. May be repeated at 5 minute intervals if dyspnea is not relieved and systolic blood pressure remains greater than 90.
- Systolic blood pressure must be greater than 100 for Nitroglycerin administration if 12 lead EKG and peripheral IV are not available. Blood Pressure must be obtained again prior to additional administration of Nitroglycerin.
- For Conscious sedation, see Sedation/Anxiety protocol. Dose should be titrated to provide comfort without causing unconsciousness or respiratory failure. Be sure to monitor patient's breathing/ventilations, blood pressure and O2 saturation.
- Once CPAP is in use, apply 1 inch Nitroglycerin Paste (Paramedic only).
- Nitroglycerin Paste is applied to upper chest and further doses of sublingual Nitroglycerin can be withheld. Remove paste and wipe chest clean if systolic blood pressure is less than 90.
- For use of CPAP, systolic blood pressure must be greater than 90.

# Narrow Complex Tachycardia (QRS <0.12)

6.4

## History:

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

## Significant findings:

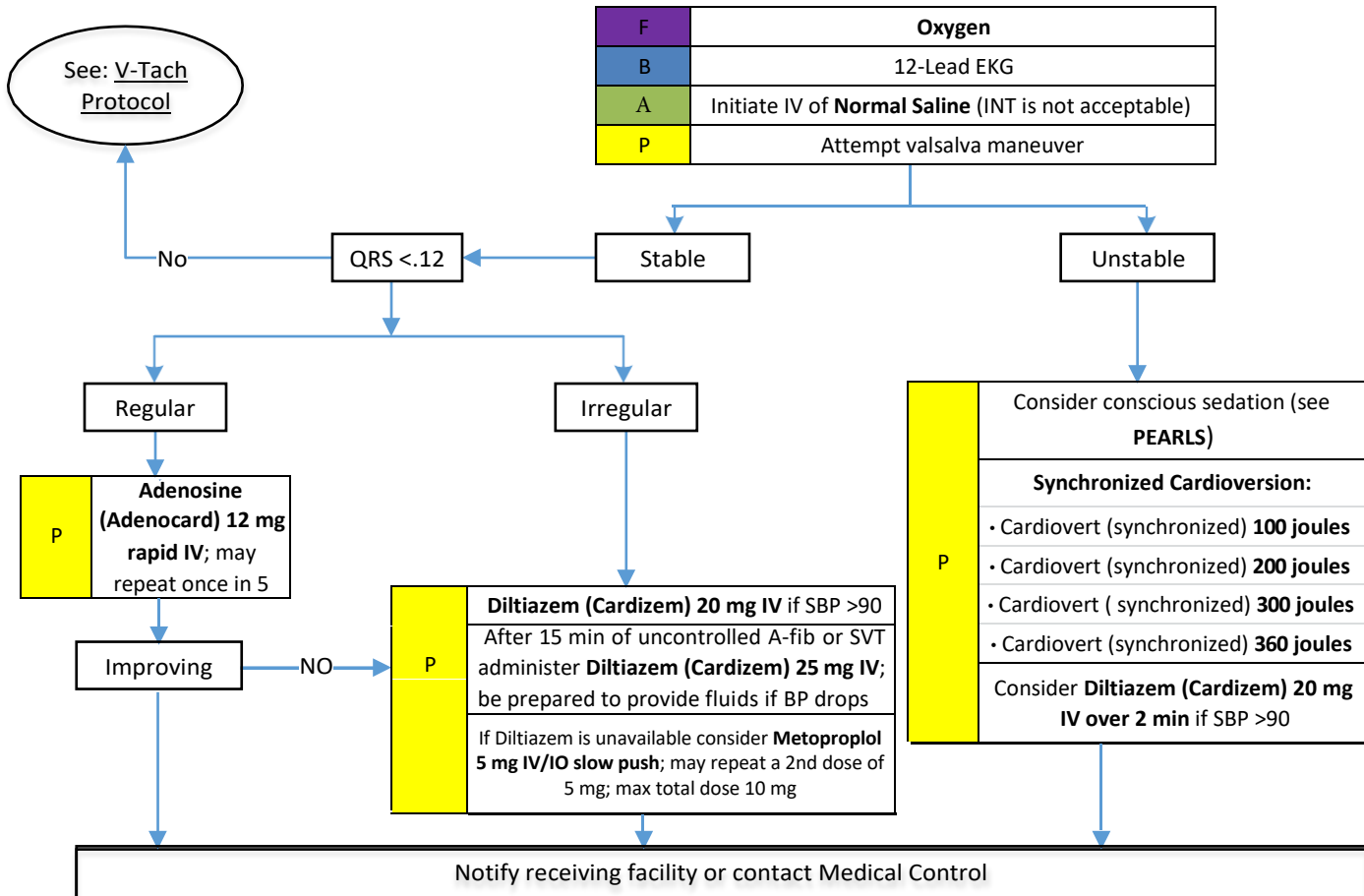
- Heart rate >150
- Systolic BP < 90
- Dizziness
- Diaphoresis
- Chest pain
- CHF
- SOB
- AMS
- **If QRS >0.12 or history of WPW, go to Sustained V-Tach Protocol**

## Potential presenting rhythm

- Atrial/sinus tachycardia
- Atrial fibrillation/flutter
- Multifocal atrial tachycardia

## Differential:

- Hypoxia
- Sepsis
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion/pain/emotional stress
- Hypovolemia/anemia
- Drugs/medications (see History)
- Hyperthyroidism
- Pulmonary embolus
- Heart disease (WPW, valvular)
- Fever
- Dehydration



## PEARLS:

- Symptomatic tachycardia usually occurs at rates of 120-150 and are typically greater than or equal to 150 beats per minute. Symptomatic patients with heart rates less than 150 likely have impaired cardiac function such as CHF.
- **Diltiazem (Cardizem)** dose may be mixed in a 50 mL bag of **Normal Saline** or **D5w** and infused over 2 minutes for more controlled administration.
- Typical sinus tachycardia is in the range of 100 to (220 minus patient's age) beats per minute.
- **Serious signs/symptoms:** hypotension, acutely altered mental status, signs of shock/poor perfusion, chest pain with evidence of STEMI or T-wave inversions or depressions, acute CHF.
- **If the patient has a history of WPW or 12-Lead EKG reveals WPW, DO NOT administer a calcium channel blocker (e.g., Diltiazem (Cardizem)), a beta blocker, or Adenosine.**
- **WPW should be treated with cardioversion or Amiodarone (Cordarone).**
- Avoid carotid sinus massage in patients over 50 years old or with a history of prior neurological event.
- For A-fib/A-flutter, consider administering **Diltiazem (Cardizem)** prior to administration of Adenosine (**Adenocard**).
- For **Conscious sedation**, see Sedation/Anxiety protocol. Dose should be titrated to provide comfort without causing respiratory failure. Be sure to monitor patient's breathing/ventilations, blood pressure and O2 saturation.
- Monitor for hypotension after administration of calcium channel blocker (i.e., **Diltiazem (Cardizem)**).
- Document all rhythm changes and therapeutic interventions with monitor strips.



## History:

- Past medical history (CHF)
- Medications
  - Aminophylline
  - Diet pills
  - Thyroid supplements
  - Decongestants
  - Digoxin
- Diet (caffeine/chocolate)
- Drugs (nicotine/cocaine)
- History of palpitation/heart racing
- Syncope/near syncope
- Allergies (Lidocaine/Novocaine)

## Significant findings:

- Ventricular tachycardia on EKG (runs/sustained)
- Chest pain
- Diaphoresis
- Dizziness
- SOB
- Heart rate usually 150-180 for sustained V-tach
- **QRS >0.12**

## Differential:

- Artifact/device failure
- Cardiac
- Endocrine/metabolic
- Drugs
- Pulmonary

Palpable pulse or wide, regular rhythm with QRS >0.12 sec

Yes

F	<b>Oxygen</b>
B	12-Lead EKG
A	Initiate IV

Stable

Unstable

See appropriate protocol

P	Consider <b>Adenosine (Adenocard) 12 mg rapid IV</b> for sustained regular wide-complex tachycardia
	<b>Amiodarone (Cordarone) 150 mg IV over 10 min</b> ; may repeat once

	Consider conscious sedation
	<b>Synchronized Cardioversion:</b>
	• Cardiovert (synchronized) <b>100 joules</b>
	• Cardiovert (synchronized) <b>200 joules</b>
	• Cardiovert (synchronized) <b>300 joules</b>
	• Cardiovert (synchronized) <b>360 joules</b>
P	<b>Amiodarone (Cordarone) 150 mg IV over 10 min</b>
	Cardiovert (synchronized) <b>360 joules</b>
	<b>Amiodarone (Cordarone) 150 mg IV over 10 min</b>
	Cardiovert (synchronized) <b>360 joules</b>

Notify receiving facility or contact Medical Control

## PEARLS:

- Stable ventricular tachycardia is defined as a hemodynamically stable patient in ventricular tachycardia without signs or symptoms of poor perfusion.
- Wide and fast = V-tach. Diltiazem (Cardizem) can cause V-fib in the V-tach patient.
- For **Conscious sedation**, see Sedation/Anxiety protocol. Dose should be titrated to provide comfort without causing respiratory failure. Be sure to monitor patient's breathing/ventilations, blood pressure and O2 saturation.
- **Administer Amiodarone (Cordarone) infusion at 1 mg/min after successful conversion of V-tach.**
- **150 mg infusion over 10 minutes:** Add 150 mg of **Amiodarone (Cordarone)** to a 50 mL bag of Normal Saline and administer through a 10 gtt set at 50 drops per minute.
- **1 mg/min infusion:** Add 150 mg **Amiodarone (Cordarone)** to a 50 mL bag of Normal Saline and administer through a 60 gtt set at 20 drops per minute.
- If torsades de pointes administer **Magnesium Sulfate 1-2 grams/2-4 mL slow IV push over 2 minutes.**
- WPW should be treated with cardioversion or **Amiodarone (Cordarone).**
- If the patient is receiving shocks from an automated internal cardiac defibrillator (AICD) and the device is shocking appropriately, utilize medications and cardioversion as if the device was not present after the second shock delivered by the AICD. It is important to place the pads a minimum of 3 inches away from the AICD. If the device is malfunctioning and shocking is not appropriate, utilize **Conscious Sedation** see Sedation/Anxiety protocol. Dose should be titrated to provide comfort without causing respiratory failure. Be sure to monitor patient's breathing/ventilations, blood pressure and O2 saturation.

## History:

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

## Significant Findings:

- Unresponsive
- Pulseless
- Apneic
- No electrical activity on EKG
- Ventricular fibrillation/ventricular tachycardia
- No auscultated heart tones

## Differential:

- Medical/trauma
- Hypoxia/pulmonary
- Potassium (hypo/hyper)
- Drug overdose
- Acidosis
- Hypothermia
- Device error/artifact

## Withhold Resuscitation:

- See **COG 1.4** for criteria for death/withholding resuscitation

## Criteria for Death/DNR

Yes

No

Contact Medical Control or Coroner

F	Refer to Team Approach CPR
	Immediate continuous compressions
	Cardiac monitor/AED
	Treat correctable causes early
B	Place BIAD and provide 10 breaths per minute
A	Initiate IV/IO

V-fib/pulseless V-tach

Asystole/PEA

P	Defibrillate <b>200 joules, 300 joules, 360 joules</b> ; all subsequent shocks at <b>360 joules</b>
	<b>Epinephrine 1 mg IV/IO</b> ; repeat every 3-5 min
	<b>Amiodarone (Cordarone) 300 mg IV/IO</b> ; repeat once at <b>150 mg</b>
	Following 3rd shock, <b>Change Pad Position</b> (Vector Change) or <b>Double Sequential Defib (DSD)</b>
A	Place 2nd IV/IO when feasible

P	<b>Epinephrine 1 mg IV/IO</b> ; repeat every 3-5 min
A	Place 2nd IV/IO if necessary

See: Post Resuscitation protocol

Return of spontaneous circulation

No

Consider Discontinuation of Prehospital Resuscitation Policy

## PEARLS:

- Epinephrine given every 3-5 minutes, max 4 doses if no change in PEA or Asystole, see Discontinuation of Resuscitation policy or contact medical control to request more doses.
- CPR 100-120 compressions per minute and at a depth of no less than 2 inches with interruptions less than 5 seconds.
- Monitor in paddles mode with metronome on.
- Consider **Calcium Gluconate (Kalcinate) 10-20 mL IV**, followed by **Normal Saline 100 mL IV** and **Sodium Bicarbonate 1 mEq/kg IV** in hemodialysis patient early in the resuscitation.
- If patient is receiving shocks from an automated internal cardiac defibrillator (AICD), wait 30-60 seconds after the internal shock to analyze the rhythm and then treat the patient as if the AICD was **not** present. Placement of the defibrillator pads should be approximately 3 inches away from the device if possible. Posterior/anterior placement is acceptable.
- If patient has signs/symptoms of CPR-induced consciousness, consider **Ketamine 1 mg/kg IV/IO (Max single dose 100 mg)**
- If patient is in persistent v-fib/v-tach, administer **Lidocaine 1 mg/kg IV/IO** after max Amiodarone dose.
- If patient is in torsades de pointes or persistent v-fib/v-tach, administer **Magnesium Sulfate 2 grams/4 mL slow IV push over 2 minutes**.
- Always confirm asystole in more than one lead.
- Only move the patient enough to make adequate room to work.
- All resuscitations initiated at the jail must be transported.
- Transport patients with persistent V-fib/V-tach.
- Assign a team resuscitation leader and utilize checklist.
- Reassess and document endotracheal tube placement and EtCO<sub>2</sub> frequently, after every move, and at transfer of care.

Ensure adequate space to work

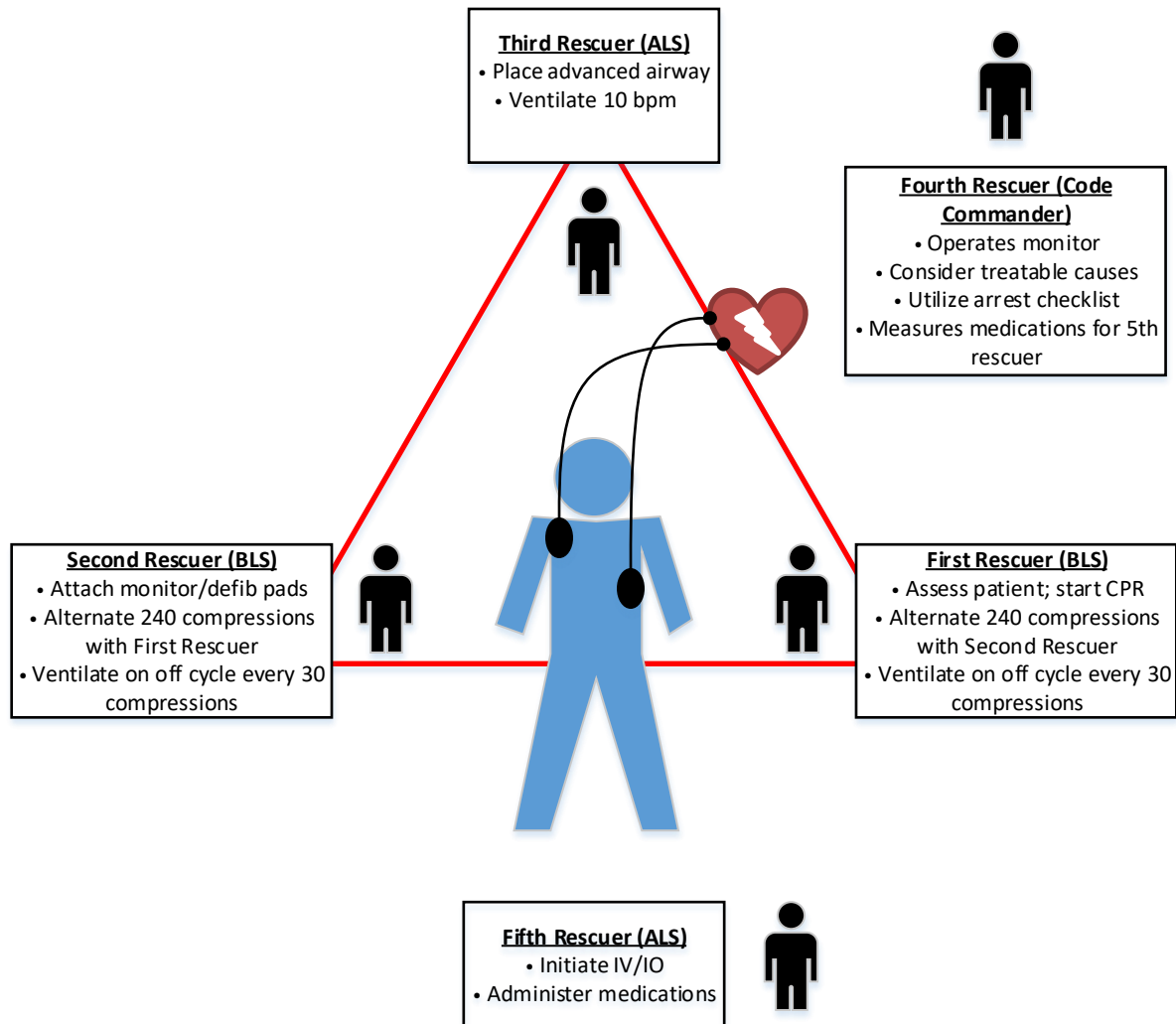
The following is listed in the order of importance; each rescuer has a specific job during the arrest

FIRST CREW ON SCENE	<b>FIRST RESCUER</b>	Begin continuous CPR compressions; push hard (adult: >2 inches; child: >1½ inches) push fast (100-120/min); change compressors every 2 min (limit changes/pulse checks to <5 sec) during entire arrest
	<b>SECOND RESCUER</b>	Attach AED/monitor and defibrillate as necessary; provide ventilations with BVM
		First and second rescuers rotate every 2 min
SECOND CREW ON SCENE	<b>THIRD RESCUER</b>	Assumes airway; consider BIAD/intubation; compressions should not be stopped to intubate
	<b>FOURTH RESCUER</b>	Establish Team Leader/Code Commander: Utilize Cardiac Arrest Checklist
	<b>FIFTH RESCUER</b>	Initiate IV/IO and administer appropriate medications at request of code commander
ALL CREWS		Follow appropriate arrest protocols
	<b>FIRST/SECOND OR THIRD RESCUER</b>	Once advanced airway is in place, ventilate every 6 sec; DO NOT interrupt compressions except for changes/pulse checks
		Continue cardiac arrest protocol

<b>CODE COMMANDER</b>
Responsible for patient care
Ensures high quality compressions
Ensures frequent compressor changes
Responsible for communication with family
Operates monitor; utilizes the event button
Measures medications and gives to 5th rescuer at time of administration

## PEARLS:

- **Ensuring high quality compressions with minimal interruptions takes priority.**
- Adequate compressions with timely defibrillation are the keys to success.
- **Monitor in paddles mode with metronome on.**
- **Do not hyperventilate!** If advanced airway is not established, compression to breath ratio should be 30:2 for adult or 15:2 for child. Once advanced airway is in place, ventilate at a rate of 10 breaths per minute.
- Each breath should be administered over 1 second with just enough air to notice chest rise.
- Provide compressions while monitor/AED is charging.
- Keep all breaks in compressions to less than 5 seconds.
- Consider possible CAUSE of arrest early: For example, resuscitated V-fib may be a STEMI and more rapid transport is indicated. Consider traditional ACLS "H's and T's" for PEA: **Hypovolemia, Hypoxia, Hydrogen ions (acidosis), Hyperkalemia, Hypothermia, Hypo/Hyperglycemia, Tablets/Toxins/Tricyclics, Tamponade, Tension pneumothorax, Thrombosis (MI), Thromboembolism (Pulmonary Embolism), Trauma.**
- When considering CAUSE, consider utilizing relevant protocols in conjunction: airway, all cardiac protocols, allergic reaction, AMS/diabetic, Poisoning/overdose, suspected stroke, etc..
- Maternal Arrest - Treat mother per appropriate protocol with immediate notification to Medical Control and rapid transport.



## History:

- Respiratory arrest
- Cardiac arrest

## Significant Findings:

- Return of pulse

## Differential:

- Continue to address specific differentials associated with the original dysrhythmia

F	Continue ventilatory support; <b>100% Oxygen</b> ; EtCO <sub>2</sub> ideally >20; RR ≤12;
B	12-Lead EKG
A	Place 2nd IV/IO

Termination of ventricular rhythm

Yes

No

Sustained Pulse

Hypotension

STEMI

Bradycardia

Follow Hypotension Guideline

Follow Acute Coronary Syndrome Guideline

Follow Bradycardia Guideline

Notify receiving facility or contact Medical Control

P	If <u>not</u> previously administered, administer <b>Amiodarone (Cordarone) 150 mg IV/IO over 10 min followed by 1 mg/min IV/IO infusion</b>
	If previously administered, administer <b>Amiodarone (Cordarone) 1 mg/min IV/IO infusion</b>

Adult Cardiac Arrest

## PEARLS:

- Rule out pulmonary edema before administration of **Normal Saline** bolus to a hypotensive patient.
- If patient remains hypotensive after initial **500 mL Normal Saline**, administer an additional **500 mL**; total **1,000 mL**.
- For transcutaneous pacing set rate for 70 beats per minute. Increase current (mA) until electrical and mechanical capture occur or pacing current reaches (200 mA).
- **Amiodarone (Cordarone)** is not a primary post-arrest medication unless significant ectopy is present.
- **150 mg infusion over 10 minutes:** Add **150 mg Amiodarone (Cordarone)** to a **50 mL bag Normal Saline** and administer through a 10 gtt set at 50 drops per minute
- **1 mg/min infusion:** Add **150 mg Amiodarone (Cordarone)** to a **50 mL bag Normal Saline** and administer through a 60 gtt set at 20 drops per minute.
- Transport to a PCI capable hospital.

## History:

- Age
- Past medical/surgical history
- Medications
- Onset
- Palliation/Provocation
- Quality (crampy/constant/ sharp/dull/ etc.)
- Region/Radiation/Referred
- Severity (1-10)
- Time (duration/repetition)
- Fever
- Last meal eaten
- Last bowel movement/emesis
- Menstrual history (pregnancy)

## Significant Findings:

- Pain (location/migration)
- Tenderness
- Nausea
- Vomiting
- Diarrhea
- Dysuria
- Constipation
- Vaginal bleeding/discharge

## Pregnancy associated symptoms (Helpful to localize source)

- Fever
- Headache
- Weakness
- Malaise
- Mental status changes
- Myalgias
- Cough
- Headache
- Rash

## Differential:

- Pneumonia or pulmonary embolus
- Liver (hepatitis/CHF)
- Peptic ulcer disease/gastritis
- Gallbladder
- Myocardial infarction
- Pancreatitis
- Kidney stone
- Abdominal aneurysm
- Appendicitis
- Bladder/prostate disorder
- Pelvic (PID/ectopic pregnancy/ ovarian cyst)
- Spleen enlargement
- Diverticulitis
- Bowel obstruction
- Gastroenteritis (infectious)

F	Oxygen
	Orthostatic blood pressure
A	Initiate IV

Hypotension with signs of poor perfusion

No

Nausea and/or vomiting

Yes

Yes

No

See:  
Nausea/Vomiting Protocol

A	≥12 years old or >55 kg: <b>Normal Saline up to 1,000 mL IV</b> to reduce signs of hypotension
	1 day to 11 years old or <55 kg: <b>Normal Saline 20 mL/kg IV; max 60 mL or 1,000 mL</b>

Notify receiving facility or contact Medical Control

## PEARLS:

- A 12-Lead will be performed on all patients over the age of 50 with a complaint of pain or discomfort above the navel, non-traumatic back pain, shortness of breath, and/or syncope.
- Abdominal pain in women of childbearing age should be treated as an ectopic pregnancy until proven otherwise.
- Antacids should be avoided in patients with renal disease.
- The diagnosis of abdominal aneurysm should be considered with abdominal pain in patients over 50.
- Repeat vital signs after each bolus.
- Appendicitis may present with vague, peri-umbilical pain which migrates to the RLQ over time.
- Appendicitis may present with rebound tenderness and abdominal guarding.
- **Age based hypotension:**
  - less than 1 year: less than 70
  - 1-10 years: less than 70 + (2 x age)
  - greater than 11: less than 90 + (2 x age)

## Right Upper Quadrant (RUQ):

Liver (Majority)  
Right Kidney  
Colon  
Pancreas (small portion)  
Gallbladder  
Small intestine

## Left Upper Quadrant (LUQ):

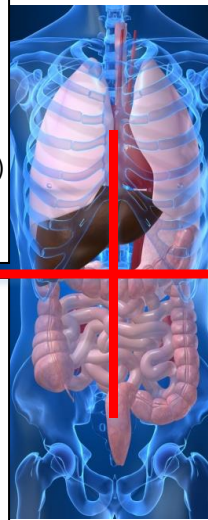
Liver (small portion)  
Spleen  
Left Kidney  
Stomach  
Colon  
Pancreas (Majority)  
Small intestine

## Right Lower Quadrant (RLQ):

Colon  
Small intestines  
Right ureter  
Appendix  
Right Ovary (Female)  
Right Fallopian tube

## Left Lower Quadrant (LLQ):

Colon  
Small intestines  
Right ureter  
Left Ovary (Female)  
Left Fallopian tube



## History:

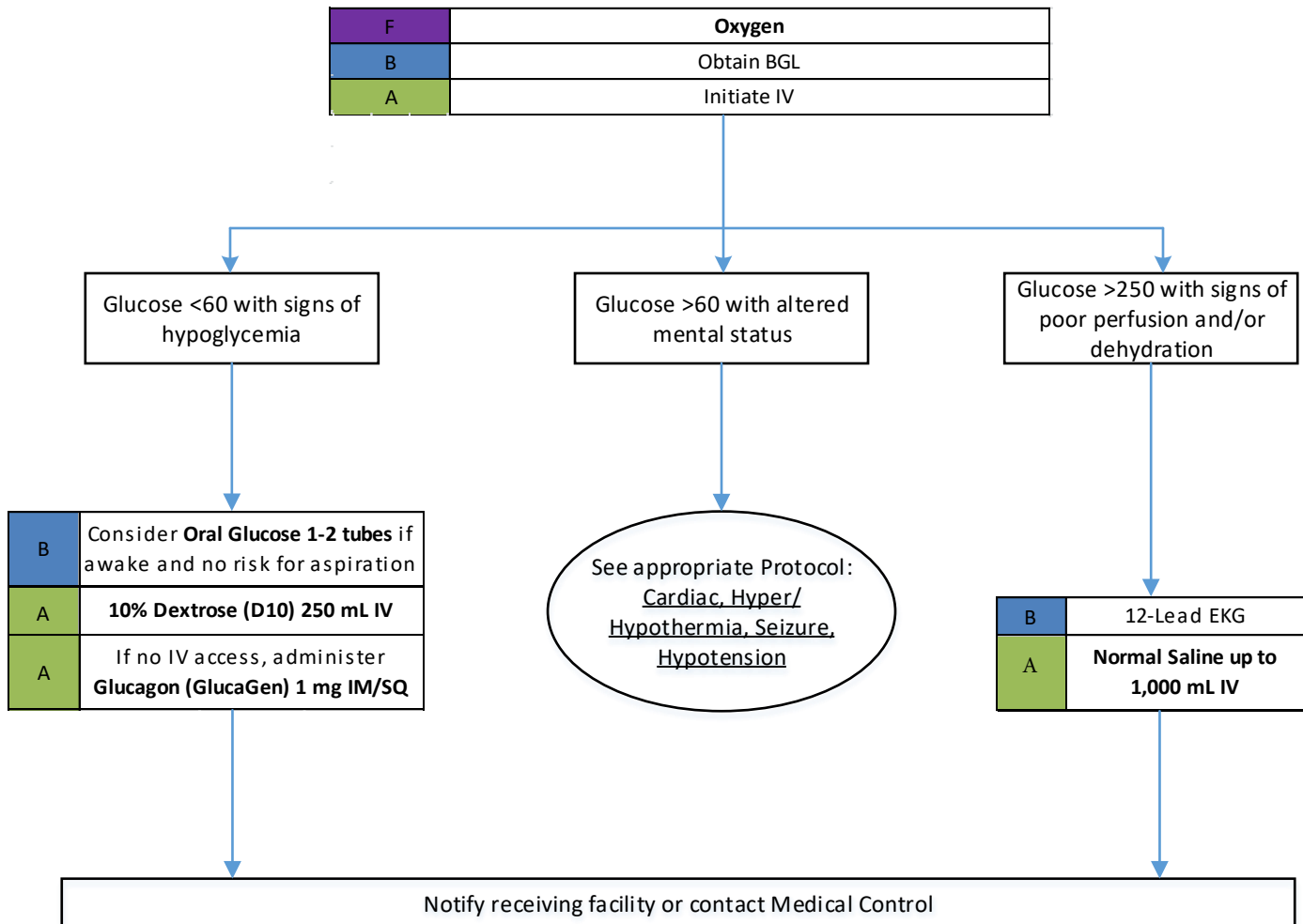
- Known diabetic; medical alert tag
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- Change in condition
- Changes in feeding or sleeping habits

## Significant Findings:

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

## Differential:

- Head trauma
- CNS (stroke/tumor/seizure/ infection)
- Cardiac (MI/CHF)
- Hypothermia/hyperthermia
- Infection (CNS and other)
- Thyroid (hyper/hypo)
- Shock
- Diabetes (hyper/hypoglycemia)
- Toxic ingestion
- Acidosis/alkalosis
- Environmental exposure
- Pulmonary (hypoxia)
- Electrolyte abnormality
- Psychiatric disorder



## PEARLS:

- Low glucose (less than 60), normal glucose (60-120), high glucose (greater than 250).
- Pay careful attention to the head exam for signs of bruising or other injury.
- While infusing **10% Dextrose (D10) solution**, monitor the patient for changes in level of consciousness and signs/symptoms of CHF/pulmonary edema.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Re-check blood glucose after administration of **Dextrose** or **Glucagon (GlucaGen)**.
- Be aware of altered mental status as a presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia and may have unrecognized injuries.
- Consider restraints if necessary for patient's and/or personnel's protection per the **Behavioral Emergencies/Chemical Restraint Protocol**.
- **50% Dextrose (D50)** can be given on a case by case basis per Paramedic discretion.



# Anaphylactic Shock/Allergic Reaction

8.3.0

## History:

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

## Significant Findings:

- Itching/hives
- Respiratory distress
- Chest/throat constriction
- Difficulty swallowing
- Hypotension/shock
- Nausea
- Vomiting

## Differential:

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

Do not use this order if chest pain is thought to be cardiac in origin

F	<b>Oxygen</b>
B	12-Lead EKG
A	Initiate IV
P	Diphenhydramine (Benadryl) 50 mg IM or 25 mg IV

**Immediately** begin rapid treatment if any of the following S/S are present.

Wheezing/airway involvement/  
hypotension/difficulty swallowing/  
swollen tongue or lips

A	<b>Epinephrine 1:1,000 0.5 mg IM; may be repeated every 15 min; max 4 doses</b>
A	<b>Normal Saline up to 1,000 mL IV to reduce signs of hypotension</b>
P	<b>Methylprednisolone (Solumedrol) 125 mg IV</b>

Respiratory distress

No

Yes

A	<b>Albuterol (Ventolin) 5 mg via nebulizer</b>
---	--

Notify receiving facility or contact Medical Control

## PEARLS:

- If the patient is hemodynamically unstable, refractory to IM Epi. and IV Fluids request an order of **Epinephrine 1:10,000 0.5 - 1mL/0.05 - 0.1 mg.**
- Ace inhibitors can cause isolated angioedema (i.e., lip swelling without airway involvement). Common ace inhibitors include Zestril (**Lisinopril**), Tritace (**Ramipril**), Renitec (**Enalapril**), Vasostad (**Captopril**), Cibacen (**Benazepril**).
- Methylprednisolone (Solumedrol) 125 mg IV and TXA 1 g over 10 minutes may be administered for isolated angioedema.

Medical



**History:**

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

**Significant Findings:**

- Itching/hives
- Respiratory distress
- Chest/throat constriction
- Difficulty swallowing
- Hypotension/shock
- Nausea
- Vomiting

**Differential:**

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

Do not use this order if chest pain is thought to be cardiac in origin

Wheezing/airway involvement/  
hypotension/difficulty swallowing/  
swollen tongue or lips

**B**

**Epinephrine Auto-Injector  
Or  
Epinephrine Anaphylaxis Kit**  
Adults: 1:1,000 0.3 mg IM  
Pediatrics: 0.15 mg IM;

**B**

Albuterol (Ventolin) 5 mg Adult, 2.5 mg Ped via nebulizer

**B**

**If conditions worsens repeat  
Epinephrine Auto-Injector  
Or  
Epinephrine Anaphylaxis Kit**  
Adults: 0.3 mg; Pediatrics: 0.15 mg

**Anaphylaxis Epinephrine Kit should include the following  
recommended items:**

- 1 - Tuberculin syringe 1 mL
- 2 - 20-22 gauge 1" – 1½" needles
- 2 - Alcohol Preps
- 1 - Epinephrine Ampule or Vial 1:1,000 – 1mg/1mL

**PEARLS:**

- Patients 15 to 30 kg: 0.15 mg or 0.15 mL. Injection site for IM injection should be the lateral thigh.
- Patients great than or equal to 30 kg: 0.3 mg or 0.3 mL.
- Contact Medical Control prior to administering Epinephrine in patients who are >50 years of age, have a history of cardiac disease, or if the patients heart rate is >150.
- The dosages follow the existing commercial Epinephrine Auto-Injector Dosages.

# Dystonic Reaction

8.3.2

## History:

- Medication allergy/exposure
- Past history of reactions
- Past medical history
- Medication history
  - Antipsychotics
  - Antiemetics
  - Ace inhibitors

## Significant Findings:

- Involuntary muscle contractions of the face, chest, neck, back, and pelvis
- Deviated pupils
- Swollen tongue

## Differential:

- Acute Extrapyrmdial reaction
- Akathisia

Do not use this order if chest pain is thought to be cardiac in origin

F	Oxygen
B	12-Lead EKG
A	Initiate IV
P	Diphenhydramine (Benadryl) 50 mg IM or 25 mg IV

See PEARLS

P	Versed 1-2 mg IV/IO; may repeat to a max of 4 mg
---	--

Or

P	Ativan 1-2 mg IV/IO; may repeat to a max of 4 mg
---	--

A	Normal Saline up to 1,000 mL IV to reduce signs of hypotension
---	--

Notify receiving facility or contact Medical Control

## PEARLS:

- Common medication groups that cause dystonic reactions include **antipsychotics**: Zyprexa (Olanzapine), Haloperidol (Haldol), Alprazolam (Xanax), Fluphenazine (Prolixin), Thorazine (Chlorpromazine), Ziprasidone (Geodon) and **antimetetics**: Compazine (Prochlorperazine), Promethazine (Phenergan), Hydroxyzine (Vistaril), Metoclopramide (Reglan).
- Patients hemodynamically unstable refractory to IV fluids request an order for **EPI 1-10,000 0.5 - 1 mL/0.05-0.1mg**
- Wait 10-15 minutes after Benadryl before administering **Versed or Ativan**.

Medical

## History:

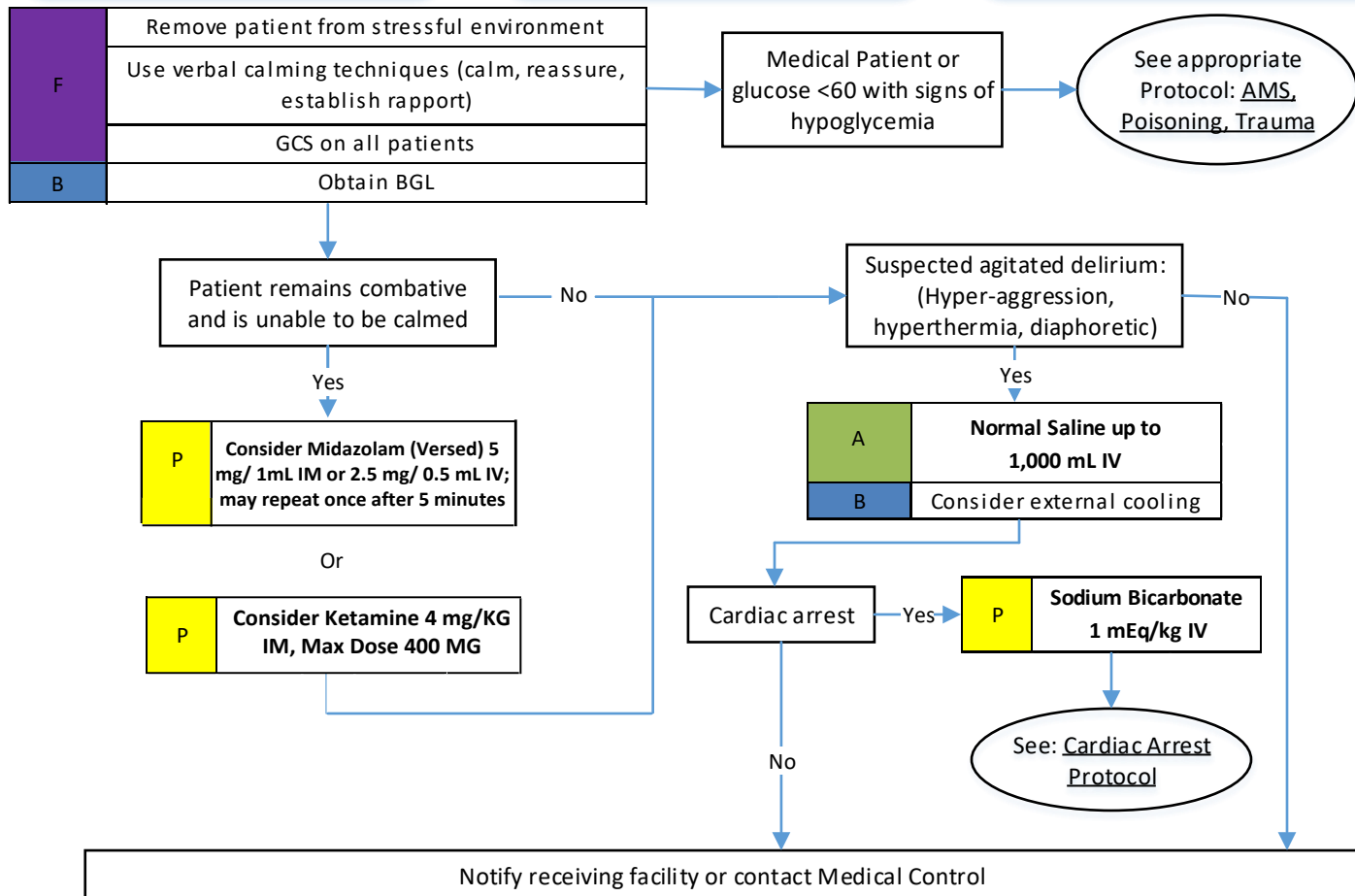
- Situational crisis
- Psychiatric illness
- Medications
- Injury to self or threat to others
- Medical alert tag
- Substance abuse/overdose
- Diabetes

## Significant Findings:

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

## Differential:

- See AMS differential
- Alcohol Intoxication
- Toxin/substance abuse
- Medication effect/overdose
- Withdrawal syndromes
- Depression
- Bipolar (manic-depressive)
- Schizophrenia
- Anxiety disorders



## PEARLS:

- Following medication administration the patient should be continuously monitored with waveform capnography and vitals Q 5.
- Use of this protocol is for the management of patients who are dangerously combative, posing an immediate threat to themselves or crew. The decision to administer this medication shall be made solely by the paramedics, acting in the patient's best interest. It is not for the management of anxiety, isolated psychosis, or redirectable behavioral issues.
- Higher doses of IM ketamine may result in respiratory depression and may require airway/breathing support. This is particularly the case in elderly patients or patients who have ingested alcohol, opiates, benzodiazepines, or recreational drugs.
- There is a possibility of laryngospasm with high dose Ketamine administration. Consider the Larson's maneuver for management.
- Be sure to consider all possible medical/trauma causes or behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.).
- **Ketamine dosing in this protocol will cause dissociation and unconsciousness even though patient will appear awake. IM injections >5 mL should be split over two separate syringes.**
- Any patient who is handcuffed or restrained by law enforcement and transported by EMS must be accompanied by law enforcement in the ambulance.
- Do not position or transport any restrained patient in such a way that could impact the patient's respiratory or circulatory status. Never hog-tie or restrain in a prone position with hands tied behind back. No restraint shall ever be tied around the head, neck or chest, nor shall pressure be applied to these areas in an attempt to restrain or control the patient.
- EMS providers may use physical and/or chemical restraints on patients who pose a danger to themselves or others. Use the minimum amount of restraint necessary.
- Physical restraints must be soft in nature and pose no threat to the patient's safety. Only the extremities shall be restrained and these restraints must be assessed every five minutes. Stretcher straps are not considered restraints.
- A surgical or oxygen mask may be placed loosely on the patient to prevent spitting.

# Eclampsia/Pre-eclampsia

8.5

## History:

- Past medical history
- Hypertension medications
- Prenatal care
- Prior pregnancies/births
- Gravida/para

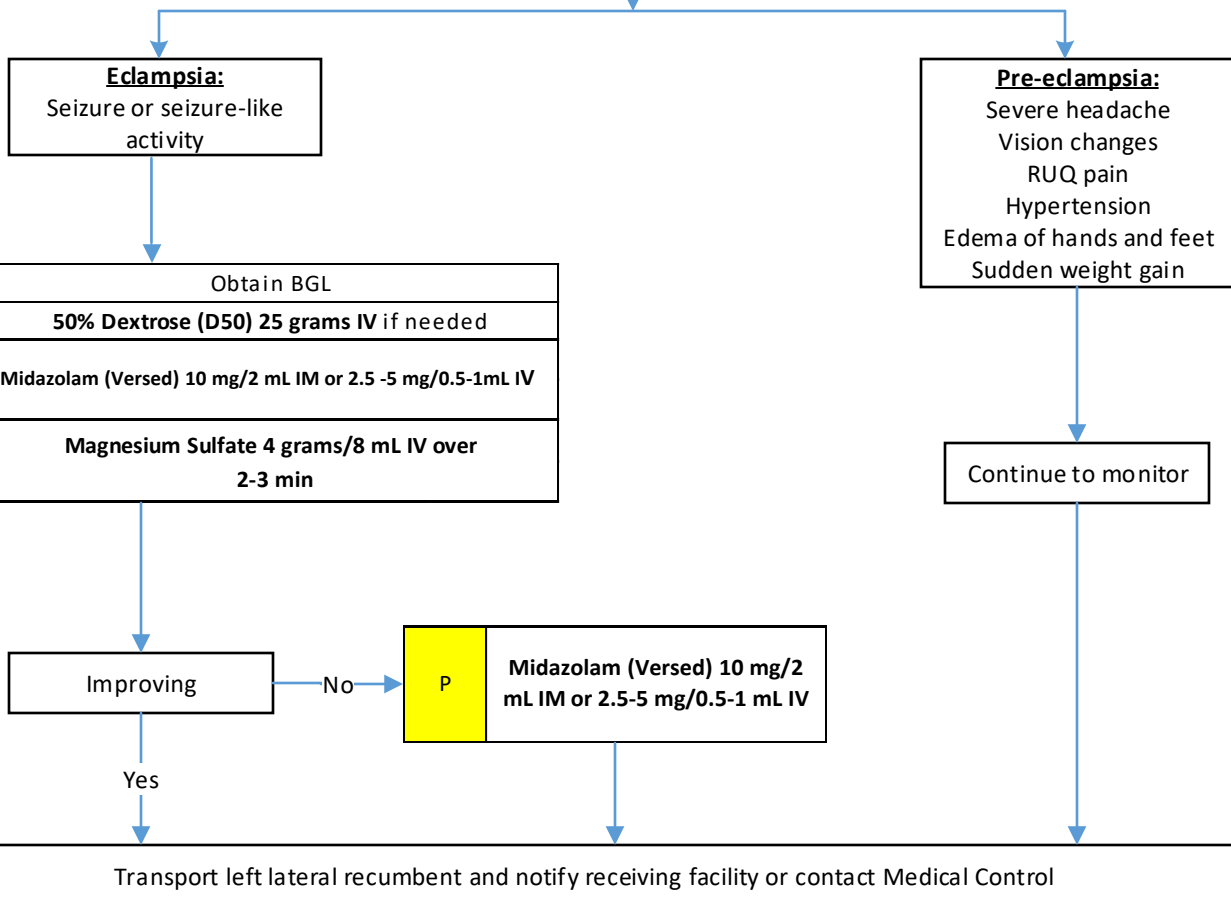
## Significant Findings:

- Vaginal bleeding
- Abdominal pain
- Hypertension
- Severe headache
- Blurred vision
- Edema of hands and face
- Seizures
- Dizziness
- Confusion
- Nausea/Vomiting

## Differential:

- Preeclampsia/eclampsia
- Placenta previa (placenta covers cervical opening)
- Placenta abruptio (separation of placenta from uterine wall)
- Spontaneous abortion
- Ectopic pregnancy

F	Oxygen
B	12-Lead EKG
A	Initiate IV



## PEARLS:

- Typically seen after the 20th week of pregnancy.
- **If seizure occurs prior to EMS arrival, give Magnesium Sulfate IV or IM. Withhold Versed unless active seizure.**
- If IV is unobtainable **Magnesium Sulfate** can be administered IM. Administer **4 grams/8 mL** in each dorsogluteal muscle (upper buttock) for a **total of 8 grams/16 mL** (5 mL max for each site). Multiple sites are necessary.
- **Magnesium Sulfate** can cause hypotension and respiratory depression; be prepared to aggressively manage the patient's airway and blood pressure.
- If **Midazolam (Versed)** is unavailable, consider **Lorazepam (Ativan) 1-4 mg slow IV push** or **Diazepam (Valium) 1-10 mg IV**.
- In the setting of pregnancy, hypertension is defined as a systolic blood pressure greater than 160 or diastolic blood pressure greater than 90, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- **Placenta abruptio** usually occurs after 20 weeks gestation. S/S: painful 3rd trimester dark red vaginal bleeding, hypotension, tachycardia.
- **Placenta previa** can occur during 2nd and 3rd trimester. S/S: painless bright red vaginal bleeding, possible hypotension, tachycardia.
- **Physiologic changes during pregnancy:** Tachycardia, tachypnea, T wave changes in II, aVF, aVL

# Hypertensive Crisis/Urgency

8.6

## History:

- Documented hypertension
- Pregnancy
- Medications (compliance ?)
- Related diseases
  - Diabetes
  - CVA
  - Renal failure
  - Cardiac
- Erectile dysfunction medication
  - Levitra
  - Cialis
  - Viagra

## Significant Findings:

### One of these

- Systolic BP  $\geq 220$
- Diastolic BP  $\geq 120$

### 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
- Eclampsia/pre-eclampsia

F	Oxygen
B	12-Lead EKG
A	Initiate IV

Respiratory distress

See: Pulmonary Edema Protocol

No

Pregnancy

See: Eclampsia/Pre-eclampsia Protocol

No

Headache or mental status change

Consider Stroke Protocol

No

P

Nitroglycerin Paste 1gram/1inch

Notify receiving facility or contact Medical Control

## PEARLS:

- **Never treat elevated blood pressure based on one set of vital signs or on vital signs alone.**
- Check blood pressure in both arms.
- Symptomatic hypertension is typically revealed through end organ damage to the cardiac, central nervous system or renal systems.
- All symptomatic patients with hypertension should be transported with their head elevated.
- Consider aortic aneurysm if patient is experiencing severe or dull pain in the abdomen, chest, lower back or groin. Risk factors for aortic aneurysm include male patients (4 of 5 patients are males), greater than 60 years old, smoking, and diabetes.

Medical

# Hypothermia

8.7

## History:

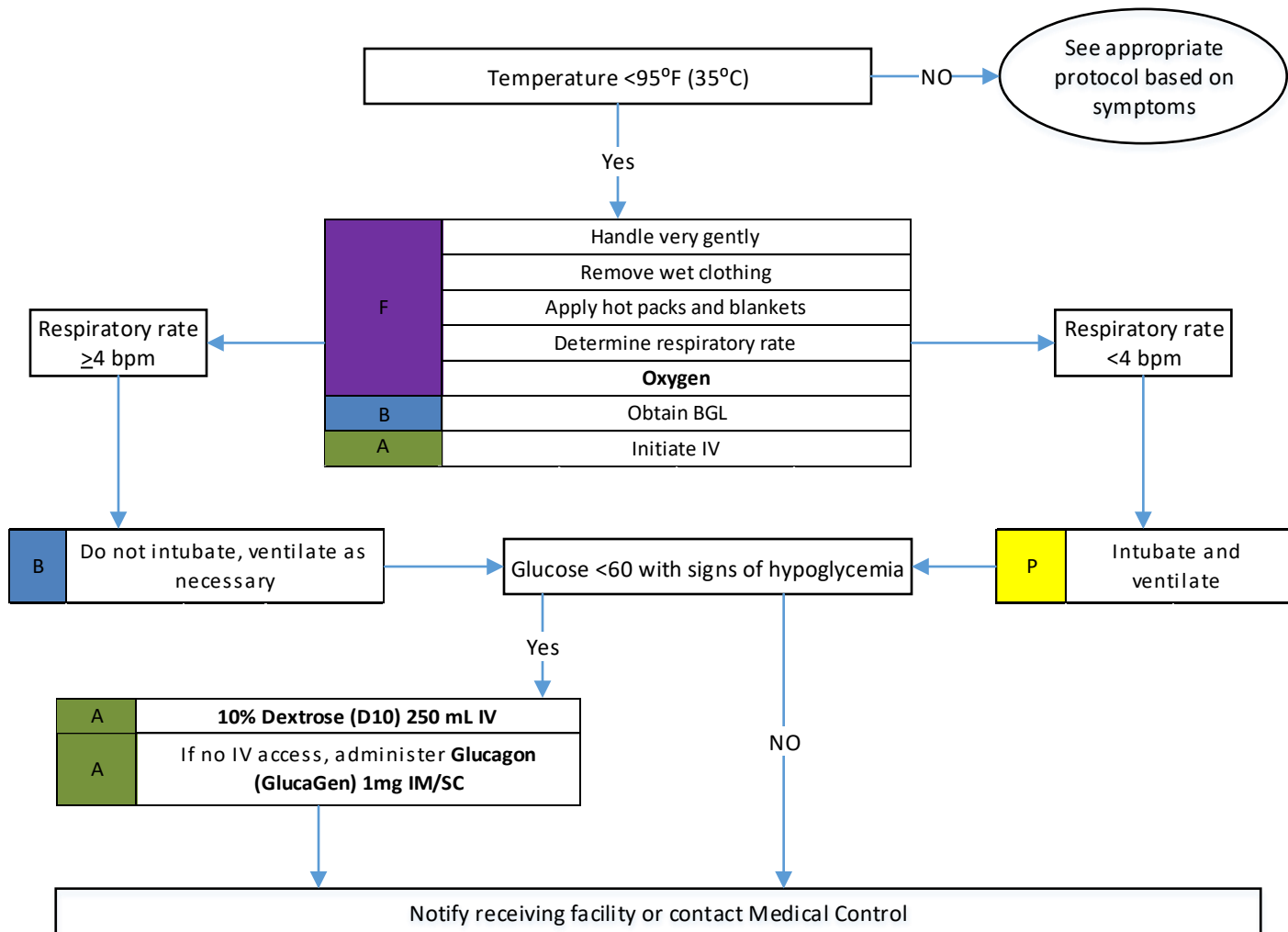
- Past medical history
- Medications
- Exposure to environment even in normal temperatures
- Exposure to extreme cold
- Extremes of age
- Drug use: alcohol/barbiturates
- Infections/sepsis
- Length of exposure/wetness

## Significant Findings:

- 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:

- **NO PATIENT IS DEAD UNTIL WARM AND DEAD!**
- Defined as core temperature less than 95°F (35°C).
- Extremes of age are more susceptible (i.e., young and old).
- With temperature less than 86°F (30°C) ventricular fibrillation is a common cause of death. Handling patients gently may prevent this.
- If the temperature is unable to be measured, treat the patient based on the suspected temperature.
- Hypothermia may produce severe bradycardia so take at least 45 seconds to palpate a pulse.
- Hot packs can be activated and placed in the armpit and groin area. Care should be taken not to place the packs directly against the patient's skin.
- Intubation can cause ventricular fibrillation so it should be done gently by the most experienced person.
- Do not hyperventilate the patient as this can cause ventricular fibrillation.
- If the patient's temperature is less than 86°F (30°C) then only defibrillate one time if defibrillation is required. Normal defibrillation procedure may resume once the temperature reaches 86°F (30°C).
- Below 86°F (30°C) antiarrhythmics may not work and, if given, should be given at reduced intervals.
- Below 86°F (30°C) pacing should not be done.

## History:

- Blood loss
  - Vaginal/gastrointestinal bleeding
  - AAA
  - Ectopic
- Fluid loss
  - Vomiting
  - Diarrhea
  - Fever
  - Infection
- Cardiac ischemia (MI/CHF)
- Medications
- Allergic reaction
- Pregnancy
- History of poor oral intake

## Significant Findings:

- Restlessness
- Confusion
- Weakness
- Dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Coffee-ground emesis
- Tarry stools

## Differential:

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

Rule out pulmonary edema (congestive heart failure)

F	Oxygen
B	12-Lead EKG
A	Initiate IV/IO

Hypotension due to cardiogenic shock (tachycardia)

Non-Cardiac Non-Trauma (Possible Sepsis/ Neurogenic)

Hypotension due to bradycardia

A	Normal Saline 500 mL Bolus
P	Levophed (Norepinephrine) 2-30 mcg/min IO/IV; titrate to maintain a MAP > 65

A	Normal Saline 1000 mL Bolus
P	Push Dose Epi 10-20 mcg (1-2 ml) every 3-5 min Or Levophed (Norepinephrine) 2-30 mcg/min IO/IV; titrate to maintain a MAP > 65

See: [Bradycardia Protocol](#)

Yes Improvement

No

M Request additional fluid

Notify receiving facility or contact Medical Control

## PEARLS:

- Consider all possible causes of shock and treat per appropriate protocol.
- For non-cardiac/non-trauma shock, **Push Dose Epi** can be given prior to **Levophed (Norepinephrine)** infusion.
- In the presence of cardiogenic shock and pulmonary edema/respiratory distress, fluid should be withheld in favor of giving pressers.
- Hypotension can be defined as a systolic blood pressure of less than 90, however, shock is often present with a normal blood pressure and tachycardia may be the only manifestation.
- Push Dose Epi: Mix 1 ml of Epi 1:10,000 with 9 ml NS=Epi 1:100,000. Admin 1-2 ml (10-20 mcg) every 3-5 minutes for hypotension.
- Assess lung sounds frequently.

## 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 and surgical history
- Medications
- Menstrual history (pregnancy)
- Travel history
- Bloody emesis/diarrhea

## Significant Findings:

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

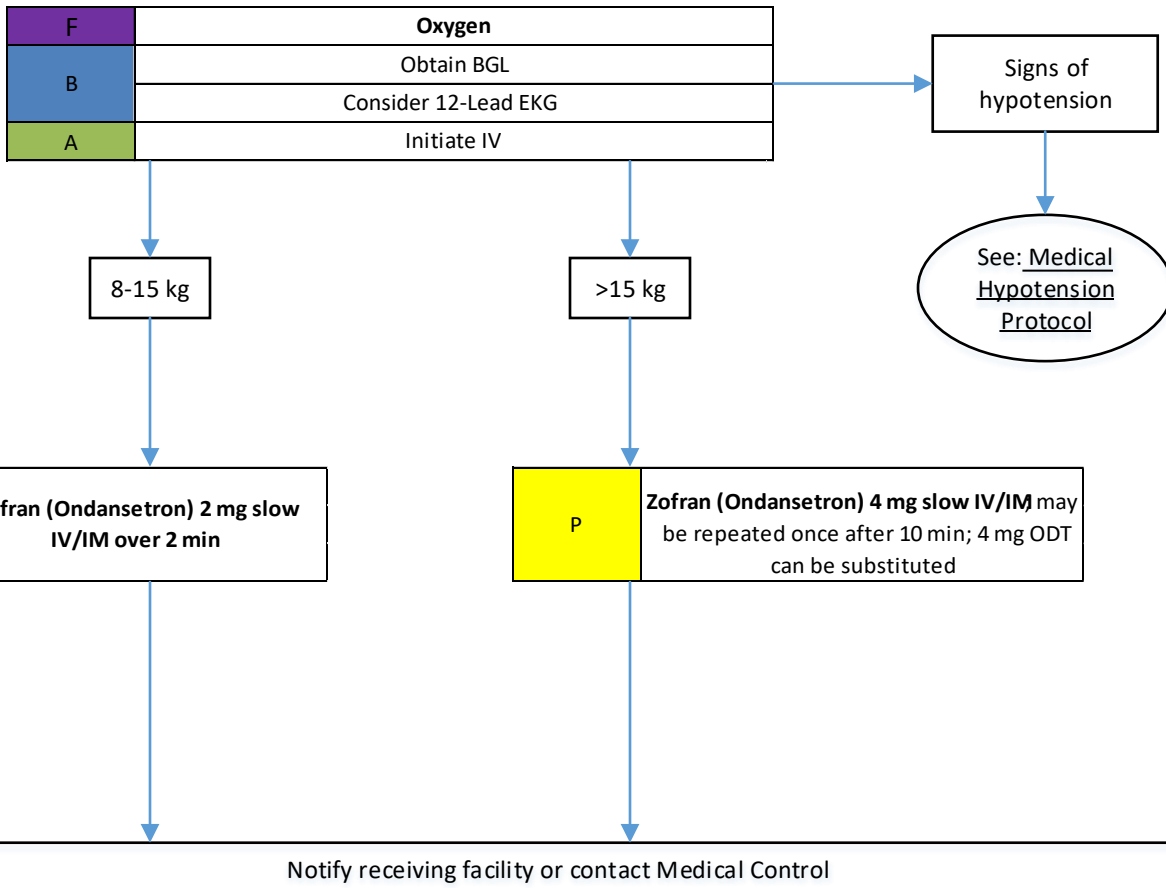
## Associated symptoms

### (Helpful to localize source)

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

## Differential:

- CNS
  - Increased pressure
  - Headache
  - Stroke
  - CNS lesions
  - Trauma/hemorrhage
  - Vestibular
- Myocardial infarction
- Drugs
- GI/renal disorders
- Diabetic ketoacidosis
- Gynecologic disease
  - Ovarian cyst
  - PID
- Infections
- Electrolyte abnormalities
- Food/toxin induced
- Pregnancy
- Psychological



## PEARLS:

- ODT Zofran (Ondansetron) 4 mg can be given to a previously healthy child  $\geq$  6 months of age.
- Use Handtevy for pediatric drug dosages.
- Zofran (Ondansetron) can cause QT widening.
- Use ODT (orally disintegrating tablets) with caution in adult patients complaining of abdominal pain.
- For ODT, place one tablet on top of patient's tongue.
- Beware of vomiting in children. Pyloric stenosis, bowel obstruction and central nervous system processes (bleeding tumors, or increased cerebral spinal fluid pressure) all often present with vomiting.
- Document the mental status and vital signs prior to administration of antiemetic medications.



## History:

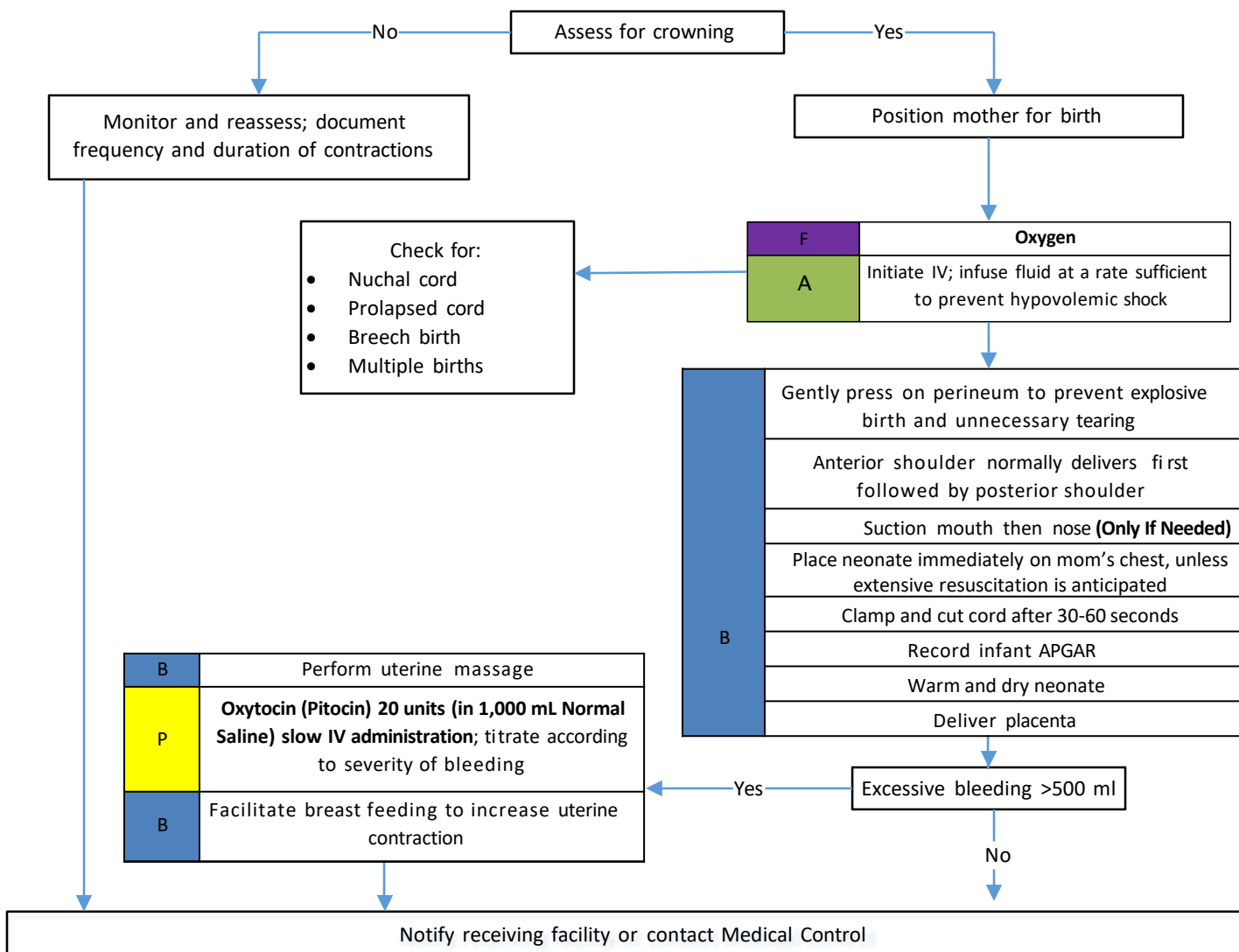
- Due date
- Medications/illicit drug use
- Prenatal care
- Gravida/para
- High risk pregnancy
- Time contractions started/how often
- Rupture of membranes
- Time/amount of any vaginal bleeding
- Sensation of fetal activity
- Past medical and delivery history

## Significant Findings:

- Spasmodic pain
- Vaginal discharge/bleeding
- Crowning/urge to push
- Meconium

## Differential:

- Abnormal presentation
  - Buttock
  - Foot
  - Hand
- Prolapsed cord
- Placenta previa
- Abruptio placenta
- Ectopic pregnancy



## PEARLS:

- Position for birth: semi-fowlers with knees drawn up and apart with buttocks elevated.
- Create a sterile field around vaginal opening.
- If nuchal cord is present, attempt to slip cord around neck. Clamp and cut if unable to remove cord.
- If prolapsed cord is present, do not attempt to place cord back into vagina. Instead, cover cord with a moist dressing and do not over-stimulate. If the baby is on the cord, insert two fingers into the vagina and attempt to lift the baby off the cord.
- In the case of a breech birth, attempt to prevent delivery. Have the mother blow hard and constant. If birth is imminent, place the mother semi-fowlers with her knees high to her chest. Do not pull the baby and let the delivery proceed naturally. If the baby's head does not deliver, insert two fingers into the vagina in the shape of a "V" in an effort to create an airway for the infant.
- **Keep the infant warm!** Dry infant, place infant on mother's chest (skin to skin); cover both infant and mother.
- Document all times (contraction frequency, length and delivery).
- Record APGAR at 1 minute and 5 minutes after birth.
- Consider transport prior to placenta delivery.

# Pain Management (Adult)

8.11

## History:

- Age
- Location
- Duration
- Severity (1-10 or Wong-Baker faces scale)
- Past medical history
- Medications
- Drug allergies

## Significant Findings:

- Severity (pain scale)
- Quality (sharp/dull/etc.)
- Radiation
- Relation to movement
- Respiration
- Increase with palpation of area

## Differential:

- Musculoskeletal
- Head trauma
- Visceral (abdominal)
- Cardiac
- Pleural/respiratory
- Neurogenic
- Renal (colic)

F	<b>Oxygen</b>
A	Initiate IV, INT not acceptable
B	Complete set of vital signs including SaO2

B	Consider <b>Nitrous Oxide</b>
P	Consider <b>Zofran (Ondansetron)</b> 4 mg IV/IO/IM
	Consider <b>Ketorolac (Toradol)</b> 15 mg IV, or 30 mg slow IM single dose
	<b>Ketamine</b> 0.3mg/kg IV/IO/IN; 30mg max single dose; may repeat once after 15 minutes
	<b>OR</b>
	<b>Morphine</b> 0.1 mg/kg IV/IO/IM; max single dose of 5mg; may repeat once
	<b>OR</b>
	<b>Fentanyl</b> 2 mcg/kg slow IV/IO/IM/IN can repeat once in 5 minutes. Max single dose of 100 mcg, max total dose 200 mcg
B	Must reassess patient's pain scale at least every 10 minutes after pain medication

Notify receiving facility or contact Medical Control

## PEARLS:

- Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery, and at disposition.
- Vital signs should be obtained pre, 5 minutes post, and at disposition with all pain medications.
- Zofran (Ondansetron) can cause QT widening.
- Contraindications to narcotic use include untreated hypotension, head injury, respiratory distress or severe COPD.
- Contraindications to Toradol include active bleed (including ulcer and GI) current anticoagulation therapy, pregnant or CVA/TBI < 24 hours, possible surgery.
- All patients should have drug allergies documented prior to administering pain medications, and avoid medications with a history of an allergy or reaction.
- Assess for significant head trauma or GCS less than 13. If present, withhold pain management.
- Maximize the use of non-pharmaceutical pain management techniques (e.g., positioning, padding and splinting, reassurance, heat/cold therapy, etc.) whenever possible.
- All patients receiving prehospital narcotic analgesic or benzodiazepines should have continuous pulse oximetry monitoring, EKG, and non-invasive capnography (if available). All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- Stop Morphine administration if significant adverse effects (severe nausea, vomiting, signs of poor perfusion, respiratory depression) or sedation (decreased mental status) develop.
- Respiratory depression should be treated with Oxygen and ventilatory support if necessary.
- Attempt verbal and tactile stimulation to reverse respiratory depression prior to considering Naloxone (Narcan).
- Administer the smallest possible reversal dose of Naloxone (Narcan) to maintain adequate respirations.

## History:

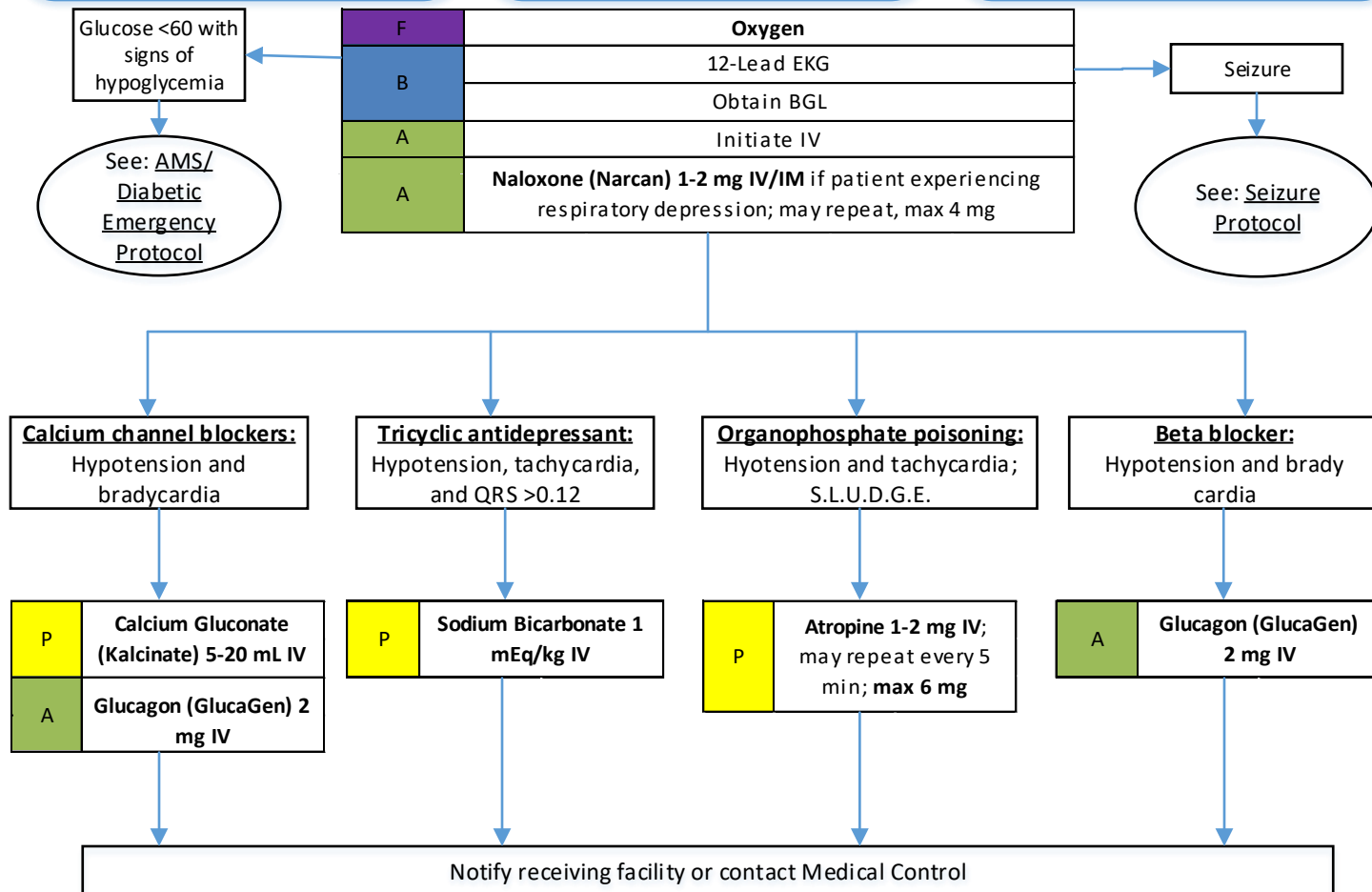
- Past medical history
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested/route/quantity
- Time of ingestion
- Reason
  - Suicidal
  - Accidental
  - Criminal
- Available medications in home
- Prescribed medications

## Significant Findings:

- Mental status changes
- Hypotension/hypertension
- Decreased respiratory rate
- Tachycardia/dysrhythmias
- Seizures
- S.L.U.D.G.E.
- D.U.M.B.B.E.L.S.

## Differential:

- Tricyclic antidepressants (TCA's)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents/alcohols/cleaning agents
- Insecticides (organophosphates)



Medical

## PEARLS:

- Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is not carrying other medications or weapons.
- Bring bottles, contents, and emesis to the emergency department.
- **S.L.U.D.G.E.:** Salivation, Lacrimation, Urination, Defecation, GI distress, Emesis.
- **D.U.M.B.B.E.L.S.:** Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Emesis, Lacrimation, Salivation.
- **Tricyclic:** 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.
- **Aspirin:** early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema, among other things, can take place later.
- **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 medications:** dysrhythmias and mental status changes.
- **Solvents:** nausea, coughing, vomiting, and mental status changes.
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
- **Narcotics/opiates:** decreased HR, decreased BP, decreased respirations, pinpoint pupils.

Consider restraints if necessary for patient's and/or personnel's protection per the **Behavioral Emergencies/Chemical Restraints Protocol**

# Opioid Overdose (First Responder Only)

8.13

## History:

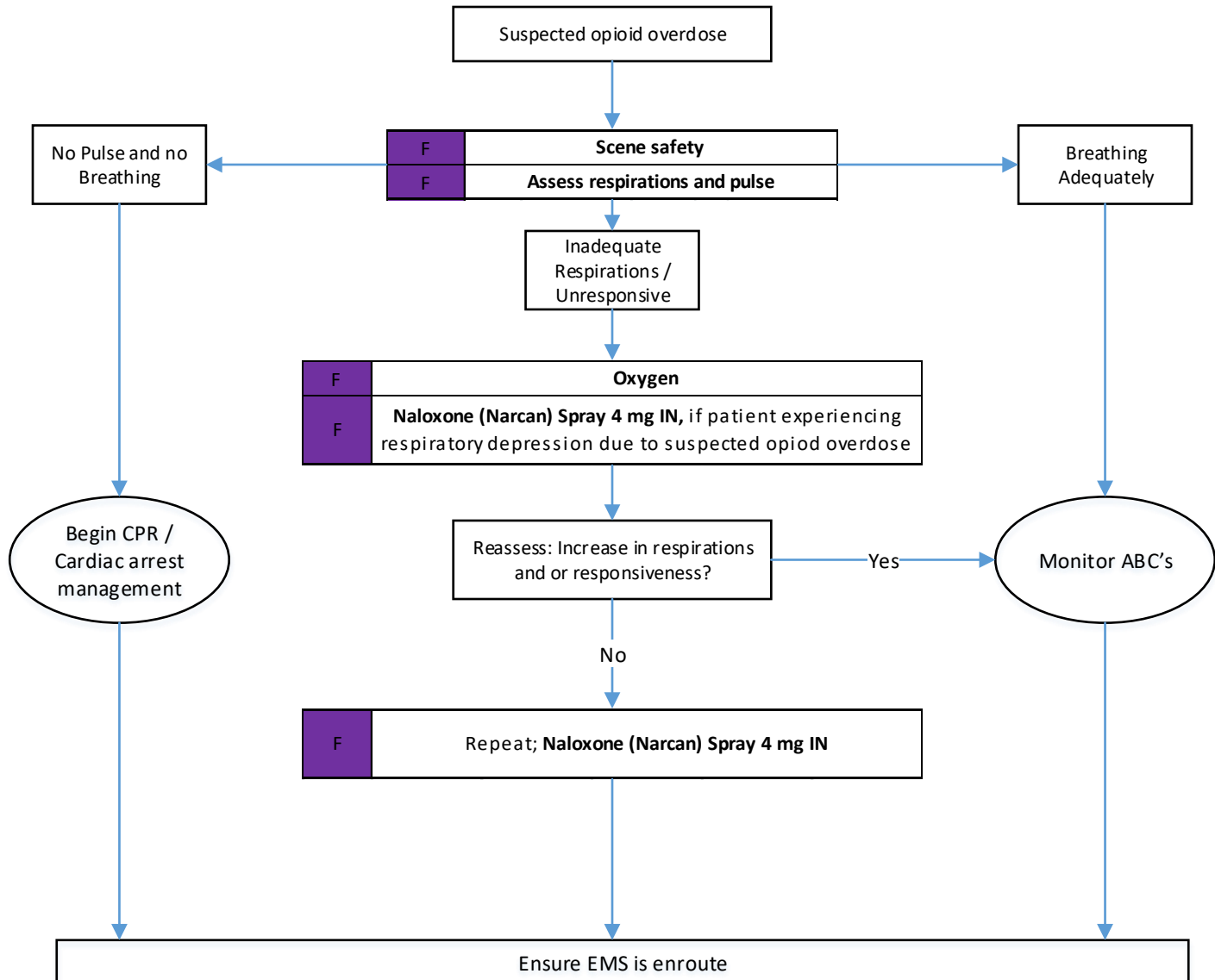
- Past medical history
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested/route/quantity
- Time of ingestion
- Reason
  - Suicidal
  - Accidental
  - Criminal
- Available medications in home
- Prescribed medications

## Significant Findings:

- Unresponsive
- Not Breathing / Agonal breathing
- Presence of drug paraphernalia
- Constricted "pinpoint" pupils
- Cyanosis
- Slow or absent pulse
- Slurred speech

## Differentials:

- Opioid overdose (morphine, methadone, hydrocodone, oxycodone, heroin, OxyContin, Percocet, Vicodin, Percodan, Demerol)



## PEARLS:

- Crew / Provider safety is priority.
- **Narcotics/opiates:** decreased HR, decreased BP, decreased respirations, pinpoint pupils.
- Consider restraints if necessary for patient's and/or personnel's protection department policies.
- **Naloxone Auto-injector IM** may be used in the place of IN if available.

Medical

## History:

- Asthma/COPD
  - Chronic bronchitis
  - Emphysema
  - Congestive heart failure
- Home treatment
  - Oxygen
  - Nebulizer
- Medications
  - Theophylline
  - Steroids
  - Inhalers
- Toxic exposure/smoke inhalation

## Significant Findings:

- Shortness of breath
- Absence of lung sounds
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing/rhonchi
- Use of accessory muscles
- Tachycardia
- Barreled chest/clubbed fingers
- Chronic signs of hypoxia
- Waveform capnography indicative of constriction

## Differential:

- Asthma
- Anaphylaxis
- Aspiration
- COPD (emphysema/bronchitis)
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI/CHF)
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin (carbon monoxide/etc.)

F	Oxygen and O2 sat
A	Combivent (DuoNeb) and/or Albuterol (Ventolin) 5 mg via nebulizer; may repeat Albuterol once
B	12-Lead EKG
A	Initiate IV

**Moderate:**  
 Speak in short sentences  
 RR: 30-40  
 O2 sat: 91-94 on room air  
 Diminished lung sounds  
 Normal mental status  
 Accessory muscle use

P	Consider CPAP at 5 cm/H2O; monitor closely for signs of barotrauma
	DO NOT increase pressure
	Consider conscious sedation
	Consider Methylprednisolone (Solumedrol) 125 mg IV/IO
	Consider Terbutaline (Breathine) 0.25 mg SQ q 20 mins, Max 0.5 mg

**Life threatening/severe exacerbation:**  
 1-2 word sentences  
 RR >40 or <10  
 O2 sat <91 on room air  
 Little or no lung sounds  
 Accessory muscle use with tripod position  
 Diaphoretic and anxious  
 High EtCo2

P	Consider CPAP at 5 cm/H2O
	Consider Methylprednisolone (Solumedrol) 125 mg IV/IO
	Consider Magnesium Sulfate 2 grams/4 mL IV over 10 minutes
A	Consider Epinephrine 1:1,000 0.3 mg IM
P	Consider Terbutaline (Breathine) 0.25 mg SQ q 20 mins, Max 0.5 mg

Notify receiving facility or contact Medical Control

## PEARLS:

- Terbutaline (Breathine) should be administered SQ to the lateral Deltoid area.
- Methylprednisolone (Solumedrol) is for COPD, asthma and anaphylaxis only!
- Magnesium Sulfate is administered by putting 2 grams/4 mL in a 50 mL bag with a 10 gtt set at 50 drops per minute.
- Pulse oximetry should be monitored continuously if initial saturation is less than or equal to 96%, or there is a decline in patient status despite normal pulse oximetry readings.
- Contact Medical Control prior to administering Epinephrine in patients who are greater than 50 years of age, have a history of cardiac disease, hypertension, or if the patient's heart rate is greater than 150. Epinephrine may precipitate cardiac ischemia.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- EtCO2 should be used when respiratory distress is significant and does not respond to initial beta-agonist dose.
- All efforts at verbal coaching should be utilized prior to conscious sedation.
- For Conscious sedation, see Sedation/Anxiety protocol. Dose should be titrated to provide comfort without causing unconsciousness or respiratory failure. Be sure to monitor patient's breathing/ventilations, blood pressure and O2 saturation.
- Combivent (DuoNeb) is packaged as 3.5 MG.
- Do not mix Combivent (DuoNeb) and 5mg of albuterol in the same nebulizer; if additional medications are needed, administer separately.

# Reactive Airway Disease (BLS Only)

8.14B

## History:

- Asthma/COPD
    - Chronic bronchitis
    - Emphysema
    - Congestive heart failure
  - Home treatment
    - Oxygen
    - Nebulizer
  - Medications
    - Theophylline
    - Steroids
    - Inhalers
- Toxic exposure/smoke inhalation

## Significant Findings:

- Shortness of breath
- Absence of lung sounds
- Pursed lip breathing
- Decreased ability to speak
- Increased respiratory rate and effort
- Wheezing/rhonchi
- Use of accessory muscles
- Tachycardia
- Barreled chest/clubbed fingers
- Chronic signs of hypoxia
- Waveform capnography indicative of constriction

## Differential:

- Asthma
- Anaphylaxis
- Aspiration
- COPD (emphysema/bronchitis)
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pneumothorax
- Cardiac (MI/CHF)
- Pericardial tamponade
- Hyperventilation
- Inhaled toxin (carbon monoxide/etc.)

F	Oxygen and O2 sat
B	Combivent (DuoNeb) or Albuterol (Ventolin) 5 mg via nebulizer; contact MC to repeat Albuterol
B	12-Lead EKG
A	Initiate IV

**Mild:**  
 Speak in full sentences  
 RR <30  
 O2 Sat >94 on room air  
 Wheezing  
 Minimal accessory muscle use

**Moderate:**  
 Speak in short sentences  
 RR: 30-40  
 O2 sat: 91-94 on room air  
 Diminished lung sounds  
 Normal mental status  
 Accessory muscle use

**Life threatening/severe exacerbation:**  
 1-2 word sentences  
 RR >40 or <10  
 O2 sat <91 on room air  
 Little or no lung sounds  
 Accessory muscle use with tripod position  
 Diaphoretic and anxious  
 High EtCo2

B	Consider CPAP at 5 cm/H2O
	<b>DO NOT</b> increase pressure

B	Consider CPAP at 5 cm/H2O
	<b>DO NOT</b> increase pressure
A	Consider <b>Epinephrine 1:1,000 0.3 mg IM</b>

Request ALS

## PEARLS:

- Treatment should escalate or decrease with patient presentation.
- **Pulse oximetry** should be monitored continuously if initial saturation is less than or equal to 96, or there is a decline in patient status despite normal pulse oximetry readings.
- **Contact Medical Control prior to administering Epinephrine in patients who are greater than 50 years of age, have a history of cardiac disease, hypertension, or if the patient's heart rate is greater than 150.** Epinephrine may precipitate cardiac ischemia.
- A silent chest in respiratory distress is a pre-respiratory arrest sign.
- EtCO2 should be used when respiratory distress is significant and does not respond to initial beta-agonist dose.
- Combivent (DuoNeb) is packaged as 3.5 MG.

Medical

**Indications:**

- Cardioversion
- Anxiety associated with CPAP
- Transcutaneous pacing
- Anxiety associated with Burns
- Severe anxiety
- Traumatic injury patient in which extrication and or movement will cause anticipated severe pain.

F	Remove patient from stressful environment
	Use verbal calming techniques (calm, reassure, establish rapport)
	GCS on all patients
B	Obtain BGL

F	<b>Oxygen</b>
B	Apply monitor
A	Initiate IV

CPAP, Burns

Severe anxiety

Procedural Sedation

P	Consider <b>Midazolam (Versed)</b> 1 mg slow IV; may repeat once in 2 min. If no IV, consider <b>Midazolam (Versed)</b> 5 mg IM.
	OR
	<b>Lorazepam (Ativan)</b> 1 mg IV/IO; may repeat once in 2 min

P	Consider <b>Midazolam (Versed)</b> 1 mg slow IV; may repeat once in 2 min. If no IV, consider <b>Midazolam (Versed)</b> 5 mg IM.
	OR
	<b>Lorazepam (Ativan)</b> 1 mg IV/IO; may repeat once in 2 min

P	Consider <b>Midazolam (Versed)</b> 1 mg slow IV; may repeat once in 2 min. If no IV, consider <b>Midazolam (Versed)</b> 5 mg IM.
	OR
	<b>Lorazepam (Ativan)</b> 1 mg IV/IO; may repeat once in 2 min
	OR
	Consider <b>Ketamine</b> 1 mg/kg Slow IV, Max Dose 100 mg

Notify receiving facility or contact Medical Control

**PEARLS:**

- **Severe anxiety:** Inhibits assessment, respiratory rate >30, inability to be reassured by non-pharmaceutical methods.
- **CPAP:** Dose should be titrated to provide comfort without causing unconsciousness or respiratory failure; just enough to reduce agitation.
- **Procedural Sedation:** Cardioversion, transcutaneous pacing.
- Always be prepared for airway management during sedation, **Ketamine** can cause laryngospasms.
- **Ketamine** is contraindicated in severe hypertension ( $\geq 210$  systolic or  $\geq 110$  diastolic).
- Be sure to monitor the patient's breathing with continuous waveform capnography, blood pressure, heart rate, and O2 saturation after administration of **Ketamine**, **Midazolam**, or **Lorazepam**.
- **Ketamine** dose of 1 mg/kg will cause disassociation and unconsciousness even though patient will appear awake. After ten minutes consider 1-2 mg IV/IO Versed to prevent emergence reaction.
- **Ketamine** can cause a heightened sympathetic response that will increase heart rate and blood pressure. Use caution in severe hypertension.

**History:**

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

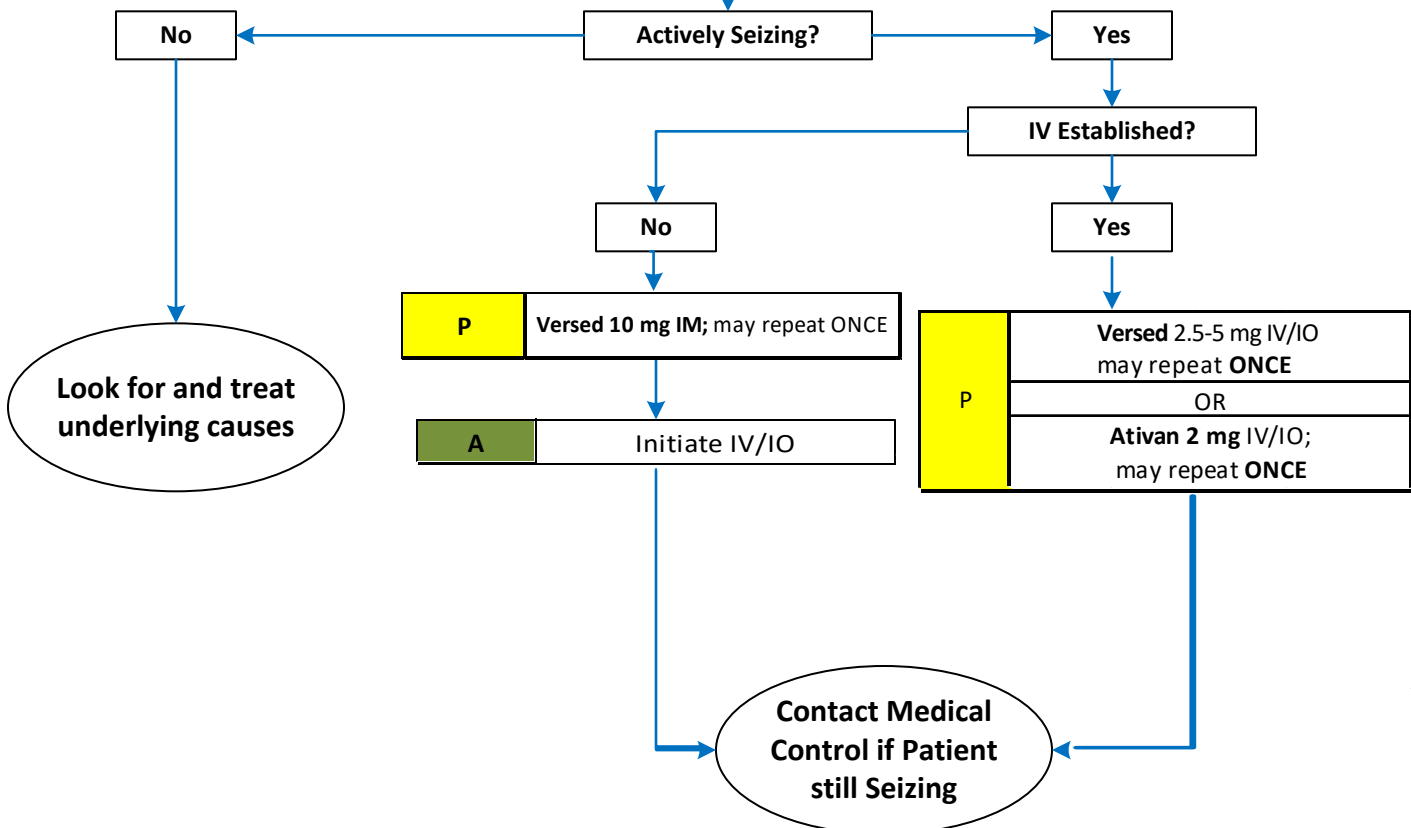
**Significant Findings:**

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

**Differential:**

- CNS (head) trauma/stroke
- Tumor
- Metabolic, hepatic, or renal failure
- Hypoxia
- Electrolyte abnormality (Na, Ca, Mg)
- Drugs/medications
- Non-compliance
- Infection/fever
- Alcohol withdrawal
- Eclampsia
- Hyperthermia
- Hypoglycemia

<b>F</b>	Oxygen
<b>B</b>	Consider 12-Lead EKG
	Obtain BGL



Notify receiving facility or contact Medical Control

**PEARLS:**

- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This includes failure to return to consciousness greater than 5 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 especially if **Midazolam (Versed)** or **Diazepam (Valium)** is used.
- For any seizure in a pregnant patient, follow the Eclampsia/Pre-eclampsia Protocol.
- Consider **Lorazepam (Ativan)** slow IV push if hypotensive.



## History:

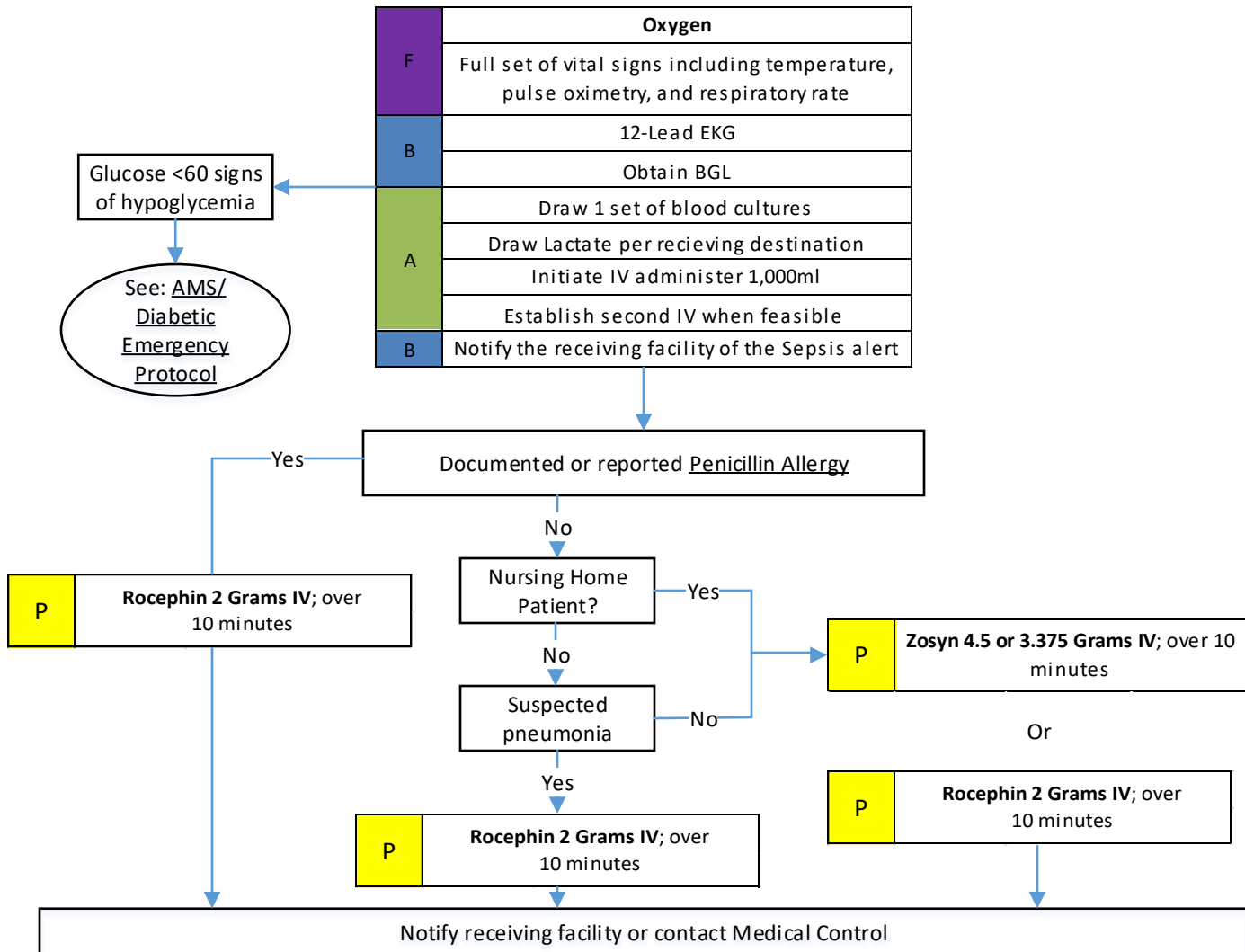
- Age > 18 Years
- Duration of fever
- Severity of fever
- Altered mental status
- Past medical history
- Medications
- Immunocompromised
  - Transplant
  - HIV
  - Diabetes
  - Cancer
- Environmental exposure
- Last Acetaminophen or Ibuprofen

## Significant Findings:

- Hyperthermia (>100.4°F/38°C)
- Hypothermia (<96.8°F/36°C)
- Tachypnea (> 20 bpm, or mechanical)
- Tachycardia (> 90 Bpm)
- Acute mental status change
- Urinary tract infection
- Pneumonia
- Skin/soft tissue infection
- Abdominal infection
- Wound infection
- Suspected meningitis, endocarditis or osteomyelitis (**See PEARLS**)

## Collecting Cultures:

- Maintain aseptic technique at all times
- Put on a new set of clean gloves
- Prepare site with Chloraprep
  - Clean 2 inch site
  - Allow site to dry
  - Do not touch once cleaned
- Remove cap from culture bottles
- Clean bottle diaphragm with alcohol
  - Allow to dry
- Venipuncture and draw blood
- Add 5-10ml of blood in each bottle
  - Aerobic first
  - Anaerobic second



## PEARLS:

- If unable to obtain cultures, do not administer antibiotics
- Determine the hospital destination prior to drawing cultures. Use the appropriate kit.
- **Utilize Sepsis Checklist and document "Blood Cultures Drawn" in flowchart of PCR.**
- **Septic shock** - Hypotension (SBP <90) refractory to fluid bolus (30ml/kg NS), Consider **Push Dose Epi 10-20 mcg q3-5 minutes or Levophed 2-30 mcg/min IV/IO titrate to maintain a MAP of >65.**
- Be alert for signs of anaphylaxis during antibiotic administration
- A second liter of **Normal Saline** can be administered for septic shock
- Extended scene times to provide antibiotic therapy are acceptable
- Withhold antibiotics if suspect meningitis, endocarditis, or osteomyelitis

**History:**

- Previous CVA/TIA
- Previous cardiac/vascular surgery
- Associated diseases
  - Diabetes
  - Hypertension
  - CAD
- Atrial fibrillation
- Medications (blood thinners)
- History of trauma

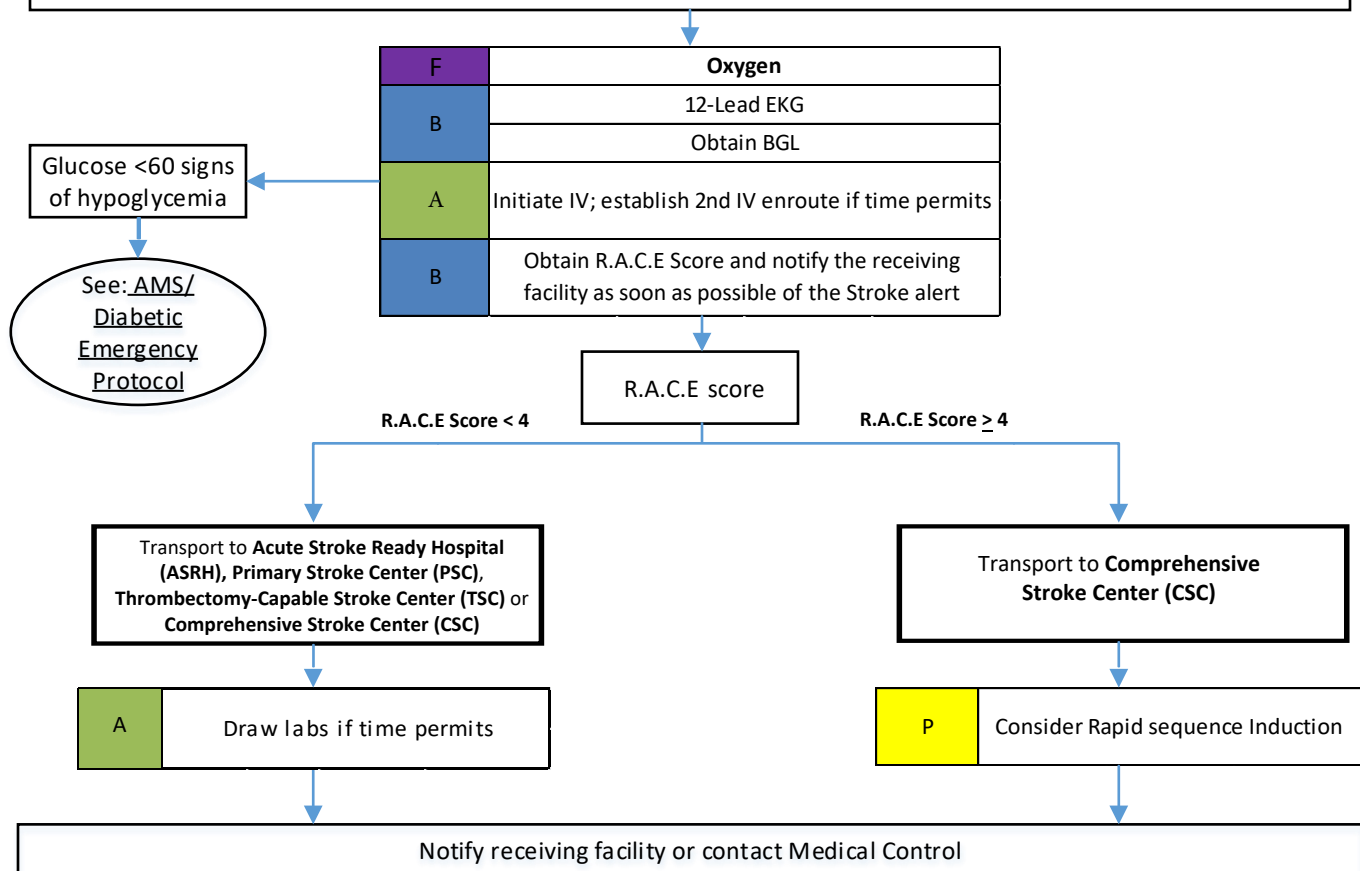
**Significant Findings:**

- 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
- Seizure
- Hypoglycemia
- Tumor
- Trauma
- Todd's paralysis
- Stroke
  - Thrombotic or Embolic (~85%)
  - Hemorrhagic (~15%)
- Dialysis/renal failure

Perform both Glasgow coma scale and Cincinnati stroke scale on patients who present with signs/symptoms of stroke

**PEARLS:**

- **Stroke Alert Activation:** involves onset of symptoms <4 1/2 hours with a R.A.C.E score of <4 and within 24 hours with any R.A.C.E score ≥ 4.
- **Comprehensive Stroke Center (CSC)** (Greenville Memorial Medical Center)
- **Primary Stroke Center (PSC)** (St. Francis Downtown, St. Francis Eastside, Greer Memorial, Prisma Health Hillcrest, and Pelham Medical Center.)
- **Acute Stroke Ready Hospital (ASRH)** (St. Francis Simpsonville)
- **Before transport, if the patient or patient's family request the patient to be taken to a particular hospital that is not a stroke center, then follow their wishes and document their refusal of recommendations in PCR.**
- All patients with new signs and symptoms of a stroke regardless of time onset are to be transported to a stroke Center.
- Minimize scene time to 15 minutes.
- **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).
- Be alert for airway problems (i.e., swallowing difficulty, vomiting, aspiration).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- **Document the stroke screen results in the patient care report (PCR); complete R.A.C.E. score on all positive stroke screens.**
- Document the 12-Lead EKG as a procedure in the PCR.
- **Todd's Paralysis** is focal weakness in a part of the body after a seizure. This weakness typically affects appendages and is localized to either the left or right side of the body. It may also affect speech, eye position (gaze), or vision. It usually subsides completely within 48 hours.

## History:

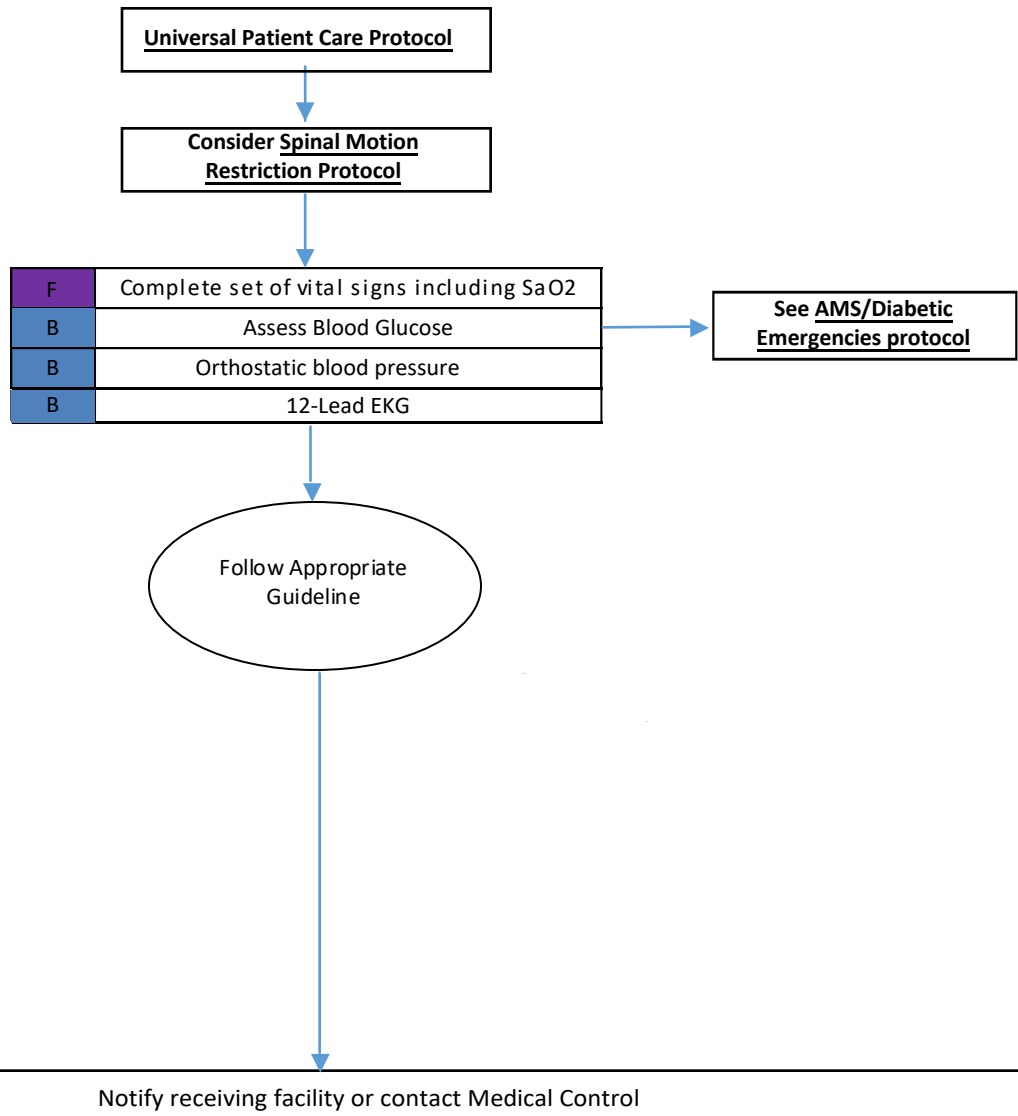
- Cardiac history, stroke, seizure
- Occult blood loss (GI, ectopic)
- Females: LMP, Vaginal bleeding
- Fluid loss: nausea, vomiting, diarrhea
- Past medical history
- Medications

## Significant Findings:

- Loss of consciousness with recovery
- 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
- Toxicologic
- Medication effect (hypotension)
- AAA
- PE



## PEARLS:

- Consider examining: Mental Status, Skin, HEENT, Heart, Lungs, Abdomen, Back, Extremities, Neuro.
- 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.
- Consider performing Cincinnati Prehospital Stroke Scale.
- These patients should be transported.
- More than 25% of geriatric syncope is related to cardiac dysrhythmia.

## Mechanism / Nature of Illness

- Signs of massive hemorrhage
- Suspected dissecting / rupturing aneurysm (abdominal or thoracic)
- GI bleeding
- Signs of intra-abdominal bleeding

## Physiological Parameters:

- Systolic (SBP) < 90 mm Hg
- HR > 120 bpm
- Shock Index (SI)  $\geq 0.9$

## Definitions:

- Shock Index (SI) : HR divided by SBP = SI

## Required Documentation:

In Flowchart, document Rh type, amount, unit lot number, and expiration date for EVERY unit administered to the patient

If patient with **Mechanism of Injury / Nature of Illness + 2 Physiological Parameters**  
\*Follow Blood Administration Checklist\*

Inter-Facility

**Follow MD Order for Type & Cross Matched Blood**  
(Follow Hospital Guidelines)

B	Warm Patient
M	Contact OLMC and request to administer <b>1 Unit O+ WHOLE BLOOD</b>

Continuously monitor during transport for changes

Improved?

NOT Improved?

REQUEST A **SECOND BLOOD COOLER** & ADMINISTER ADDITIONAL BLOOD PRODUCTS

P

**3 gm Calcium GLUCONATE IV/IO**  
SLOW over 15 min

Continuously monitor patient through all phases of transport

NO

Monitor for Transfusion Reaction

YES

**STOP INFUSION!**  
follow **COG 8.3 Anaphylaxis**

Notify receiving facility or contact Medical Control and alert "Code Transfusion"

(CONTINUED ON NEXT PAGE)

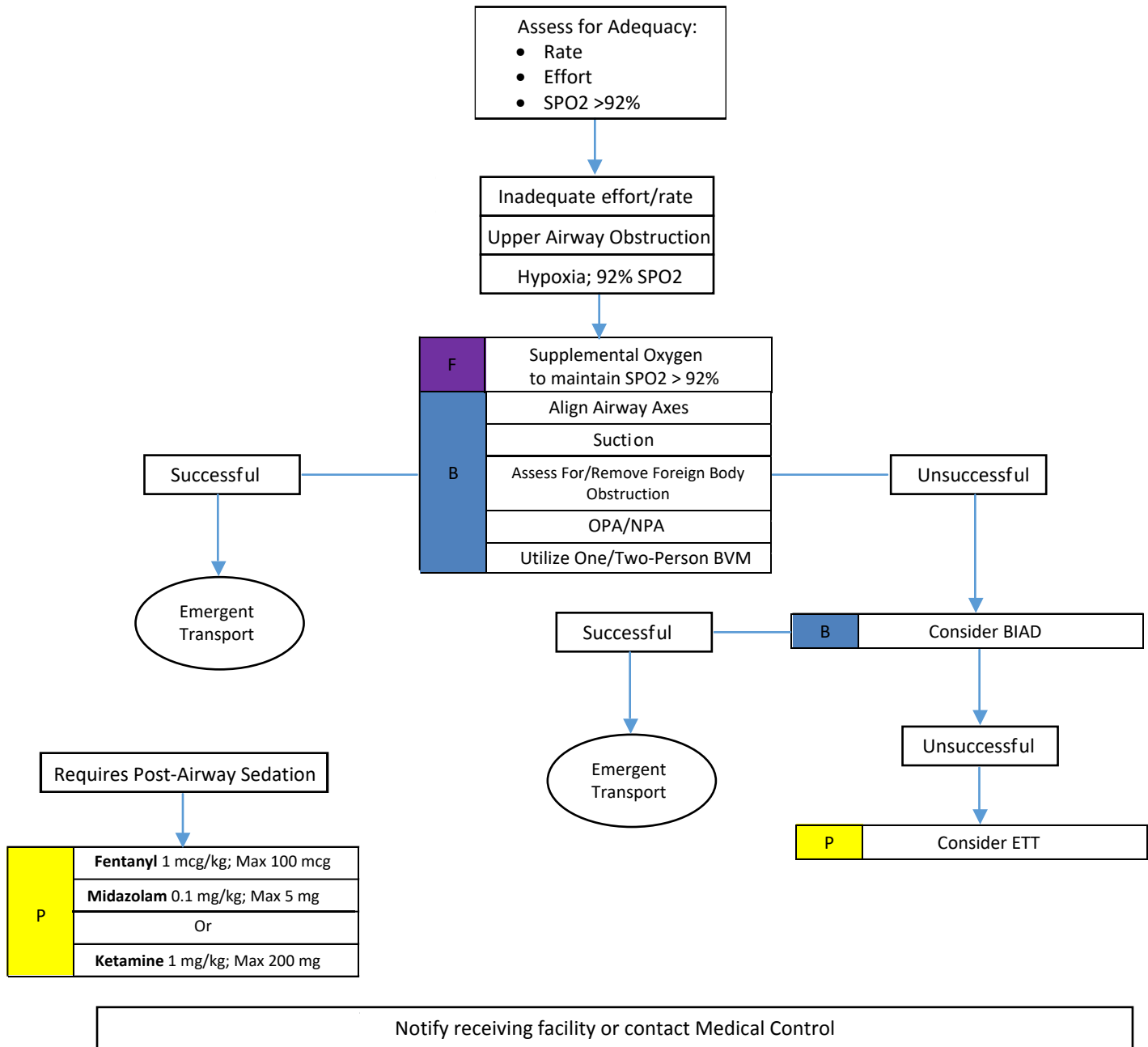
## PEARLS:

**\*\*FOR ANY MEDICAL PATIENT RECEIVING O+ WHOLE BLOOD, PROVIDERS MUST CONTACT OLMC FOR ORDERS AND DOCUMENT WHO THEY NOTIFIED ON THEIR ePCR\*\***

- Prime blood tubing and warmer. Tubing should be changed after 2 Units if possible, or as manufacturer recommends. Care should be taken to prevent hypothermia.
- Monitor patients for signs and symptoms of transfusion reaction and adverse effects, including temperature at time of infusion and 15 minutes after start.
- Consider any fluid overload issues such as CHF or patient weight (pediatrics), and monitor for signs and symptoms appropriately.
- **Allergic reaction (onset <15 min)** - Mild skin itching or hives < 25% body, Temp 38C (100.4F) or change of  
of  
• 1C (>2F) from pre-transfusion value, chills, and hives/rash >25% body
- **Febrile transfusion reactions:** - Temp 38C (100.4F) or change of >1C (<1.8F) from pre-transfusion value, chills, headache, facial flushing, palpitations, cough, chest tightness, increased pulse rate and/or flank pain
- **Hemolytic transfusion reaction:** - Immediate lysis of transfused blood can result in fever and/or tachycardia. Other symptoms can include chills, back/flank pain, nausea/vomiting, dyspnea, flushing, bleeding, and/or hypotension. Begin aggressive NS 0.9%/LR treatment
- **Dilutional thrombocytopenia** - This is generally not seen with infusion of 1 – 2 units, unless patient has pre-existing thrombocytopenia or disseminated intravascular coagulation.
- **Potassium intoxication (hyperkalemia)** - Symptoms can include flaccidity, muscle twitching, bradycardia, EKG changes (tall peaked T waves, prolonged P-R interval, absent P waves, prolonged QRS) and/or cardiac arrest.
- **Hypocalcemia: (from citrate toxicity that binds Ca)** - Symptoms can include arrhythmias, hypotension, muscle cramping, nausea, vomiting, seizure activity, and/or tingling sensation in the fingers. Patient with acute or chronic hepatic insufficiency are at relatively higher risk of citrate toxicity. Treatment with Calcium Gluconate 3 gm infused slowly in a different IV/IO line if possible.

**FOR ANY REACTION, STOP THE INFUSION, REMOVE ALL TUBING AND PRODUCT FROM THE PATIENT AND SAVE ALL EQUIPMENT. FLUSH IV LINE.**

Contact Medical Control for additional boluses as necessary



## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- **Pulse oximetry** should be monitored continuously if initial saturation is less than or equal to 96%, or there is a decline in patient status despite normal pulse oximetry readings.
- Do not force a child into a position. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control. Avoid direct laryngoscopy unless intubation is imminent.
- BIAD is the preferred airway with patients in cardiac arrest. Deviation from this requires justification in PCR.
- Capnometry or capnography is mandatory with all methods of advanced airway management with appropriate documentation.
- An intubation attempt is defined as passing the laryngoscope blade or endotracheal tube past the teeth.
- Ventilatory rate/minute should be 30 for neonates, 25 for toddlers, 20 for school age, and 8-24 for adolescents and adults. Maintain a EtCO2 between 35 and 45 and avoid hyperventilation.
- Maintain C-spine immobilization for patients with suspected spinal injury.
- Miller blade is preferred for pediatric patients.
- Pad behind the patient's shoulders to achieve the sniffing position to assist in aligning airway axes.
- Follow current BLS guidelines for foreign body airway obstruction. If ALS, consider direct laryngoscopy and magill forceps.

# Pediatric Medical Cardiac Arrest

9.1

## History:

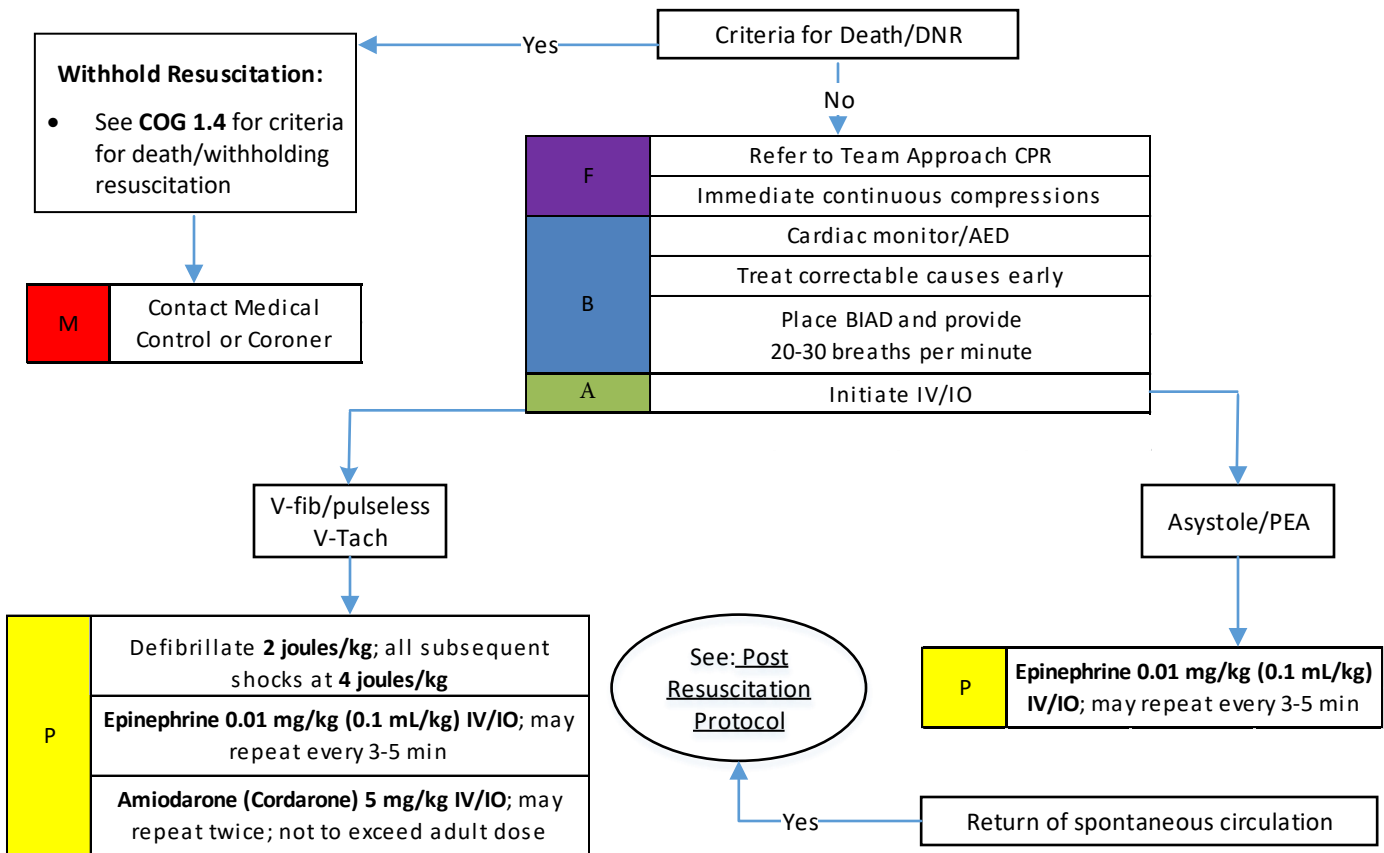
- Estimated downtime
- Medical history
- Medications
- Hypothermia
- Possibility of foreign body
- Events leading to arrest

## Significant Findings:

- Unresponsive
- Pulseless
- Apneic
- No electrical activity on EKG
- Ventricular fibrillation/ventricular tachycardia
- No auscultated heart tones

## Differential:

- Respiratory failure
  - Foreign body
  - Infection
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Hypothermia
- Medication/toxin
- Hypoglycemia



## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- The majority of pediatric arrests are due to airway problems, therefore airway is the most important intervention. This should be accomplished immediately. Patient survival is often dependent on airway management success.
- CPR 100-120 compressions per minute and at a depth of no less than 1/3 of anterior/posterior diameter of chest with interruptions of less than 5 seconds.
- Rotate compressors and check rhythm every 2 minutes.
- **Monitor in paddles mode with metronome on.**
- Always confirm asystole in more than one lead.
- Assign a team resuscitation leader and utilize checklist.
- Minimize patient movement.
- After an advanced airway is placed, rescuers no longer deliver "cycles" of CPR.
- Continue **Epinephrine** until rhythm changes or physician directs otherwise.
- Most maternal medications pass through breast milk to the infant. Consider **Naloxone (Narcan) 0.1 mg/kg IV/IM; max 2 mg.**
- Hypoglycemia, severe dehydration, and narcotic effects may produce bradycardia.
- In order to be successful in pediatric arrests, a cause must be identified and corrected.
- Reassess and document endotracheal tube placement and EtCO<sub>2</sub> frequently, after every move, and at transfer of care.

# Pediatric Bradycardia

9.2

## History:

- Past medical history
- Medications (maternal/infant)
- Foreign body exposure/swallowed
- Respiratory distress/arrest
- Infection
  - Croup
  - Epiglottitis
- Apnea
- Possible toxic/poison exposure
- Congenital heart disease

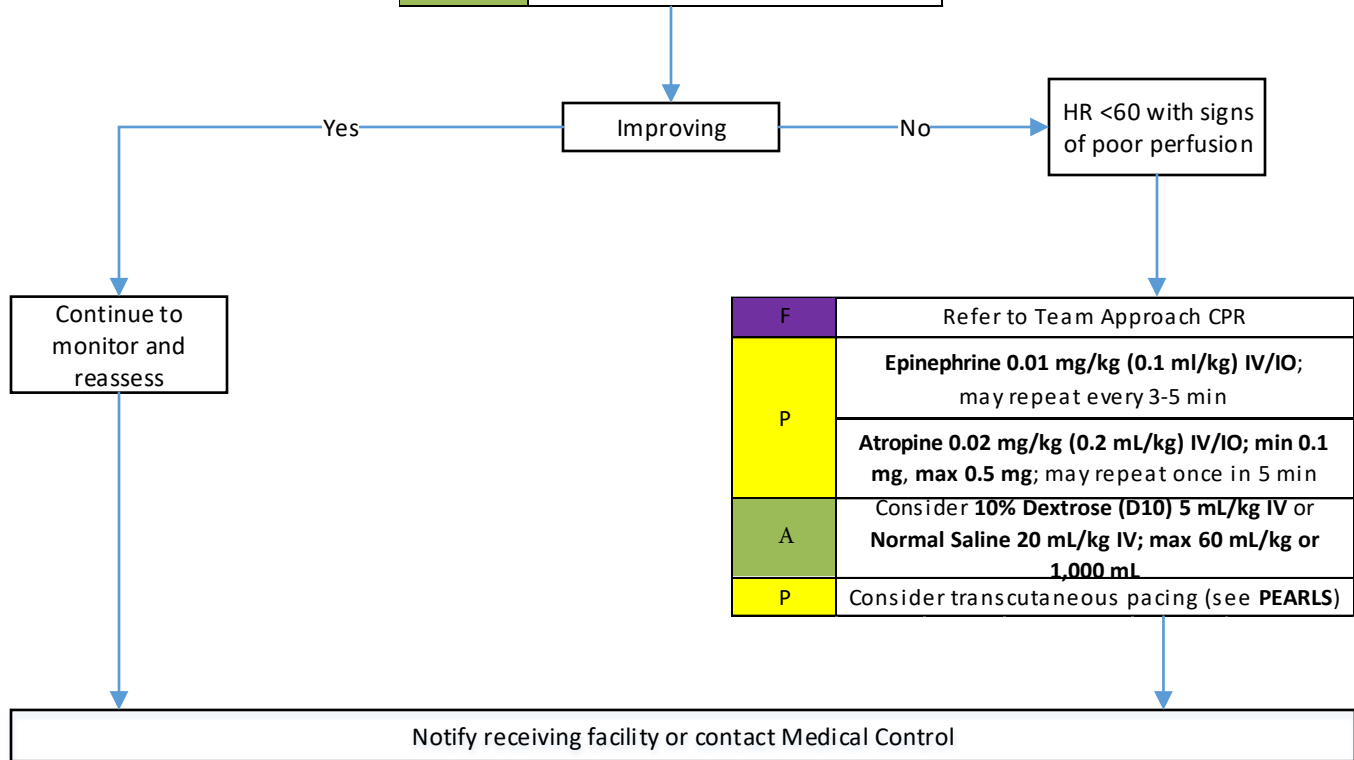
## Significant findings:

- Decreased heart rate
- Delayed capillary refill/cyanosis
- Mottled, cool skin
- Hypotension
- Respiratory difficulty
- Altered level of consciousness

## Differential:

- Respiratory failure
  - Foreign body
  - Infection
- Hypovolemia (dehydration)
- Congenital heart disease
- Trauma
- Tension pneumothorax
- Hypothermia
- Medication/toxin
- Hypoglycemia
- Acidosis

F	Administer <b>Oxygen</b> and hyperventilate patient approximately 2 min
B	12-Lead EKG
A	Initiate IV/IO



## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- The majority of pediatric arrests are due to airway problems. Search for and treat contributing factors (H's and T's).
- Most maternal medications pass through breast milk to the infant. Consider **Naloxone (Narcan) 0.1 mg/kg IV/IO; max 2 mg.**
- Hypoglycemia, severe dehydration and narcotic effects may produce bradycardia.
- **Transcutaneous pacing table:**

Age	Rate (bpm)	Systolic BP (mmHg)
0-3 mo	120-150	85 (+/-25)
3-6 mo	120-130	90 (+/-30)
7-10 mo	120	96 (+/-25)
11-18 mo	110-120	100 (+/-30)
19-35 mo	110-120	100 (+/-20)
3-4 yr	100-110	100 (+/-20)
5-6 yr	100	100 (+/-15)
7-9 yr	90-100	105 (+/-15)
10-12 yr	80-90	115 (+/-20)
>12 yr	70-80	120 (+/-20)



## History:

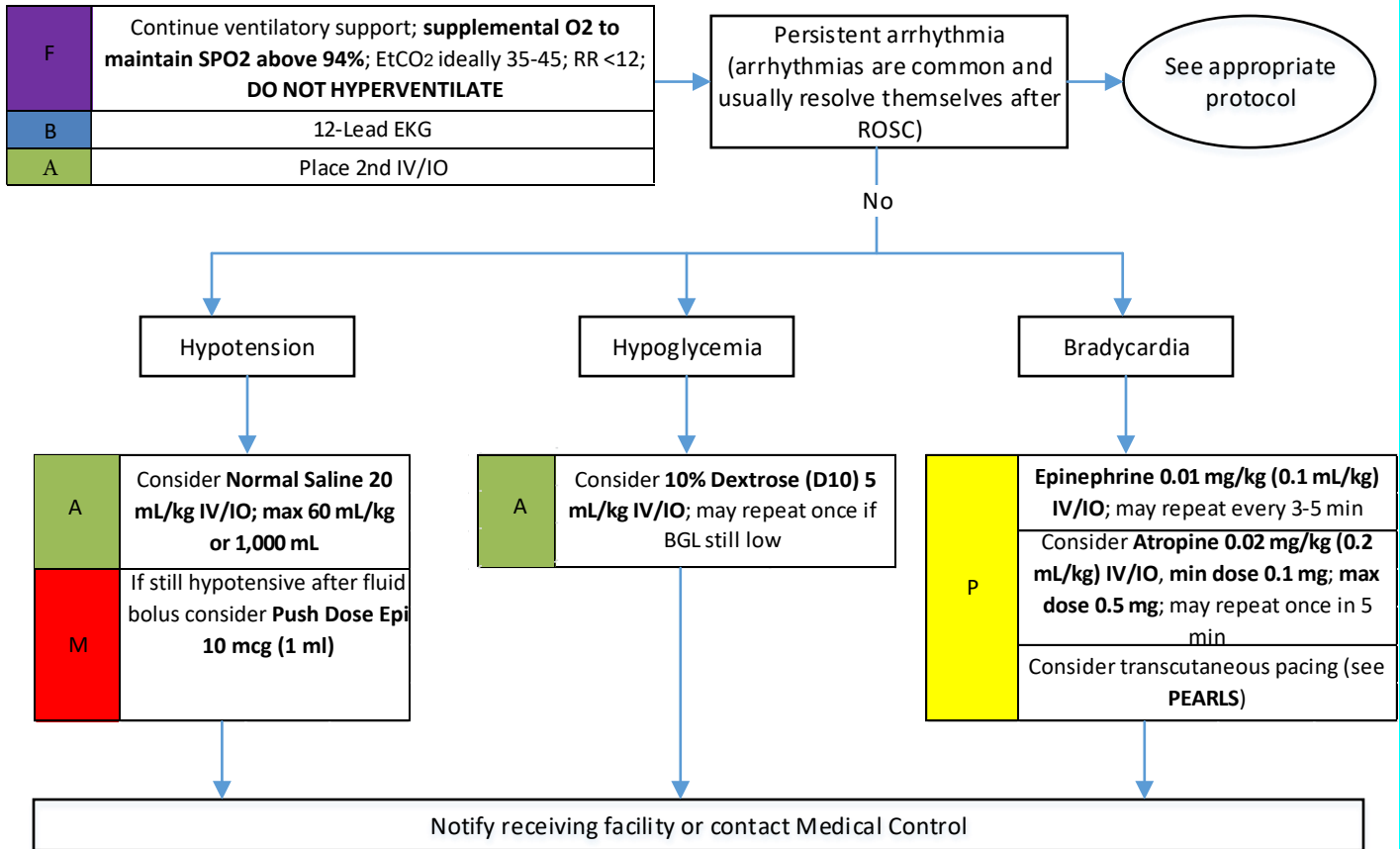
- Respiratory arrest
- Cardiac arrest

## Significant Findings:

- Return of pulse

## Differential:

- Address specific differentials associated with the original dysrhythmia



## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- Use Handtevy for drug dosages and color chart.**
- If patient remains hypotensive after initial **Normal Saline** bolus, contact Medical Control for additional fluid.

### Transcutaneous pacing table:

Age	Rate (bpm)	Systolic BP (mmHg)
0-3 mo	120-150	85 (+/-25)
3-6 mo	120-130	90 (+/-30)
7-10 mo	120	96 (+/-25)
11-18 mo	110-120	100 (+/-30)
19-35 mo	110-120	100 (+/-20)
3-4 yr	100-110	100 (+/-20)
5-6 yr	100	100 (+/-15)
7-9 yr	90-100	105 (+/-15)
10-12 yr	80-90	115 (+/-20)
>12 yr	70-80	120 (+/-20)

# Pediatric Unstable Tachycardia

9.4

## History:

- Past medical history
- Medications/toxic ingestion
  - Aminophylline
  - Diet pills
  - Thyroid supplements
  - Decongestants
  - Digoxin
- Drugs (nicotine/cocaine)
- Congenital heart disease
- Prior history of tachycardia
- Syncope/near syncope
- Respiratory distress

## Significant findings:

- Heart Rate
  - Child >180/bpm
  - Infant >220/bpm
- Pale/cyanotic
- Diaphoresis
- Tachypnea
- Unresponsive
- Hypotension

## Differential:

- Congenital heart disease
- Hypo/hyperthermia
- Hypovolemia/anemia
- Electrolyte imbalance
- Anxiety/pain/emotional stress
- Fever/infection/sepsis
- Hypoxia
- Hypoglycemia
- Medication/toxin (see **History**)
- Pulmonary embolus
- Trauma
- Tension pneumothorax

F	Oxygen
B	12-Lead EKG
A	Initiate IV/IO
P	May attempt valsalva maneuver (ice or cold rag to patient's face)

Narrow QRS ( $\leq 0.08$ )

Wide QRS ( $> 0.08$ )

P	Strongly rule out differential diagnosis (i.e., postictal, fever, etc.)
M	Adenosine (Adenocard) 0.1 mg/kg IV/IO; max 6 mg
	Adenosine (Adenocard) 0.2 mg/kg IV/IO; max 12 mg
	Consider conscious sedation (see <b>PEARLS</b> )
	Cardiovert (synchronized) 0.5-1 J/kg; increase to 2 J/kg if necessary

P	Consider conscious sedation (see <b>PEARLS</b> )
	Cardiovert (synchronized) 0.5-1 J/kg; increase to 2 J/kg if necessary

Notify receiving facility or contact Medical Control

## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- Carefully distinguish sinus tach, SVT, and V-tach. Rule of thumb: the maximum sustainable sinus tach rate is 220 minus the patient's age in years.
- Tachycardia in pediatrics is normally caused by hypoxia or hypovolemia. Identify and treat underlying causes.
- For conscious sedation administer **Midazolam (Versed) 2.5 mg/0.5 mL IM** if less than 13 kg; if greater than 13 kg administer **Midazolam (Versed) 5 mg/1 mL IM**; if IV obtained, administer **Lorazepam (Ativan) 0.1 mg/kg IV; max 2 mg.**
- Separating the child from the caregiver may worsen the child's clinical condition.
- Pediatric paddles should be used in children less than 10 kg or color **purple**.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.

Pediatric

## History:

- Past medical history
- Medications
- Recent blood glucose check
- Last meal
- History of trauma
- Change in condition
- Changes in feeding/sleeping habits

## Significant Findings:

- Altered mental status
- Lethargy
- Combative/irritable
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin, fruity breath, Kussmaul respirations: rapid, deep breathing, signs of dehydration)
- Seizure
- Abdominal pain
- Nausea/vomiting
- Weakness

## Differential:

- Alcohol/drug use
- Toxic ingestion
- Head trauma
- CNS (stroke/tumor/seizure/ infection)
- Altered baseline mental status
- Hypothermia/hyperthermia
- Thyroid (hyper/hypo)
- Shock
- Diabetes (hyper/hypoglycemia)
- Acidosis/alkalosis
- Environmental exposure
- Pulmonary (hypoxia)
- Electrolyte abnormality
- Psychiatric disorder

F	Oxygen
B	Obtain BGL
A	Initiate IV

Glucose <60 with signs of hypoglycemia

Glucose >60 with altered mental status

Glucose >250 with signs of poor perfusion and/or dehydration

B	Consider <b>Oral Glucose 1-2 tubes</b> if awake and no risk for aspiration
A	<b>10% Dextrose (D10) 5 mL/kg IV;</b> may repeat once if still unresponsive and low BGL
A	If no IV access, administer <b>Glucagon (GlucaGen) 0.1 mg/kg IM/SQ; max 1 mg</b>

See appropriate protocol: Cardiac, Hyper/hypothermia, Seizure, Hypotension

M	Contact Medical Control
---	-------------------------

Notify receiving facility or contact Medical Control

## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- Be judicious and cautious when providing fluid to children in DKA.
- Low glucose (less than 60), normal glucose (60-120), high glucose (greater than 250).
- Pay careful attention to the head exam for signs of bruising or other injury.
- While infusing **10% Dextrose (D10)**, monitor the patient for changes in level of consciousness. **Can be administered by AEMT but a Paramedic must be the primary attendant.**
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists. Re-check blood glucose after administration of **Dextrose** or **Glucagon (GlucaGen)**.
- Be aware of altered mental status as a 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 Behavioral Emergency/Chemical Restraint Protocol.

## History:

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

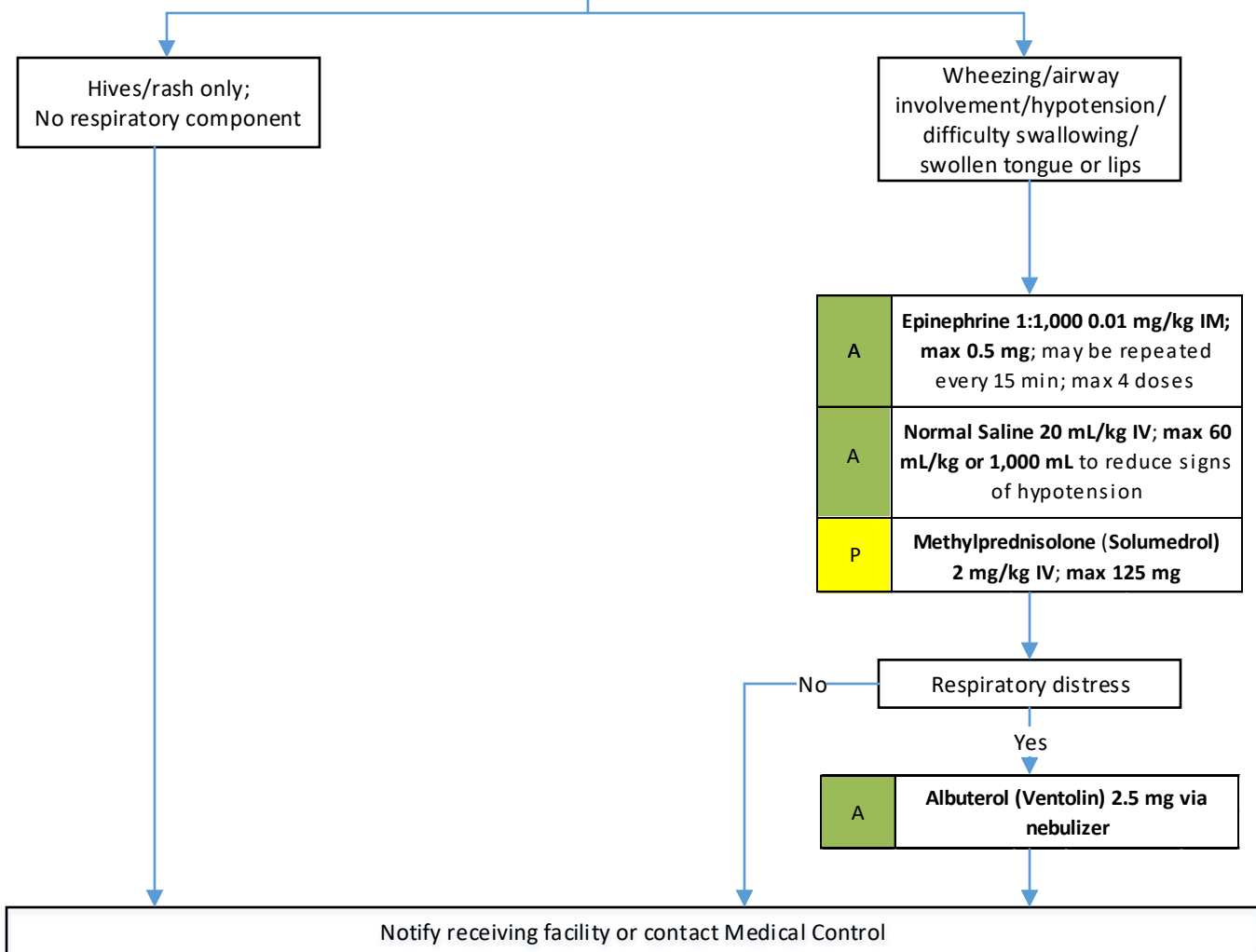
## Significant Findings:

- Itching/hives
- Coughing/wheezing/respiratory distress
- Chest/throat constriction
- Difficulty swallowing
- Hypotension/shock
- Edema
- Dystonic/extrapyramidal reaction**
  - Involuntary muscle contractions of the face, chest, neck, back, and pelvis
  - Deviated pupils
  - Swollen tongue

## Differential:

- Urticaria (rash only)
- Anaphylaxis (systemic effect)
- Shock (vascular effect)
- Angioedema (drug induced)
- Aspiration/airway obstruction
- Vasovagal event
- Asthma
- Congenital heart disease
- Infection
  - Pneumonia
  - Croup
  - Epiglottitis

F	Oxygen
B	12-Lead EKG
A	Initiate IV/IO
P	Diphenhydramine (Benadryl) 1 mg/kg IV/IM; max 30 mg



## PEARLS:

- Common medication groups that cause dystonic reactions include **antipsychotics**: Zyprexa (Olanzapine), Haloperidol (Haldol), Alprazolam (Xanax), Fluphenazine (Prolixin), Thorazine (Chlorpromazine), Ziprasidone (Geodon) and **antiemetics**: Compazine (Prochlorperazine), Promethazine (Phenergan), Hydroxyzine (Vistaril), Metoclopramide (Reglan).
- If the patient is hemodynamically unstable, request an order of **Epinephrine 1:10,000 0.01 mg/kg IV/IO; max 0.3 mg**.

# Pediatric Fever/Infection Control

9.7

## History:

- Age
- Duration of fever
- Severity of fever
- Past medical history
- Medications
- Immunocompromised
  - Transplant
  - HIV
  - Diabetes
  - Cancer
  - Sickle Cell Disease
  - <60 days old
- Environmental exposure
- Last Acetaminophen or Ibuprofen

## Significant Findings:

- Warm
  - Flushed
  - Sweaty
  - Chills/rigors
- Associated Symptoms (Helpful to localize source)**
- Myalgias
  - Cough
  - Dysuria
  - Mental status changes
  - Rash
  - Chest pain
  - Headache

## Differential:

- Infections/sepsis
- Cancer/tumors/lymphomas
- Medication/drug reaction
- Connective tissue disease
- Arthritis
- Vasculitis
- Hyperthyroidism
- Heat stroke
- Meningitis

Contact, droplet, and airborne precautions

F	Orthostatic blood pressure
	<b>Oxygen</b>
B	Measure temperature
	Initiate IV
A	Consider <b>Normal Saline 20 mL/kg IV; max 60 mL/kg or 1,000 mL</b>

Temperature >100.4°F (38 °C);  
if awake and no risk for  
aspiration

Yes

B

**Acetaminophen  
(Tylenol) 15 mg/kg PO**

No

Notify receiving facility or contact Medical Control

## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for pediatric drug dosages.**
- **Acetaminophen** quick calculation: Weight in kg/2 = dose in mL.
- Febrile seizures are more likely in children with a history of febrile seizures and with a rapid elevation in temperature.
- Patients with a history of liver failure should not receive **Acetaminophen (Tylenol)**.
- **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 non-rebreather O<sub>2</sub> 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. A patient with a potentially infectious rash should be treated with droplet precautions.
- **Airborne 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 (i.e., 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 (i.e., SARS)
- Rehydration with fluids increases the patients ability to sweat and improves heat loss.
- All patients should have drug allergies documented prior to administering pain medications.
- NSAID's should not be used in the setting of environmental heat emergencies.

Pediatric

## History:

- Blood
- Fluid loss (vomiting/diarrhea/fever)
- Infection
- Congenital defects
- Birth complications
- Medications
- Allergic reaction
- History of poor oral intake

## Significant Findings:

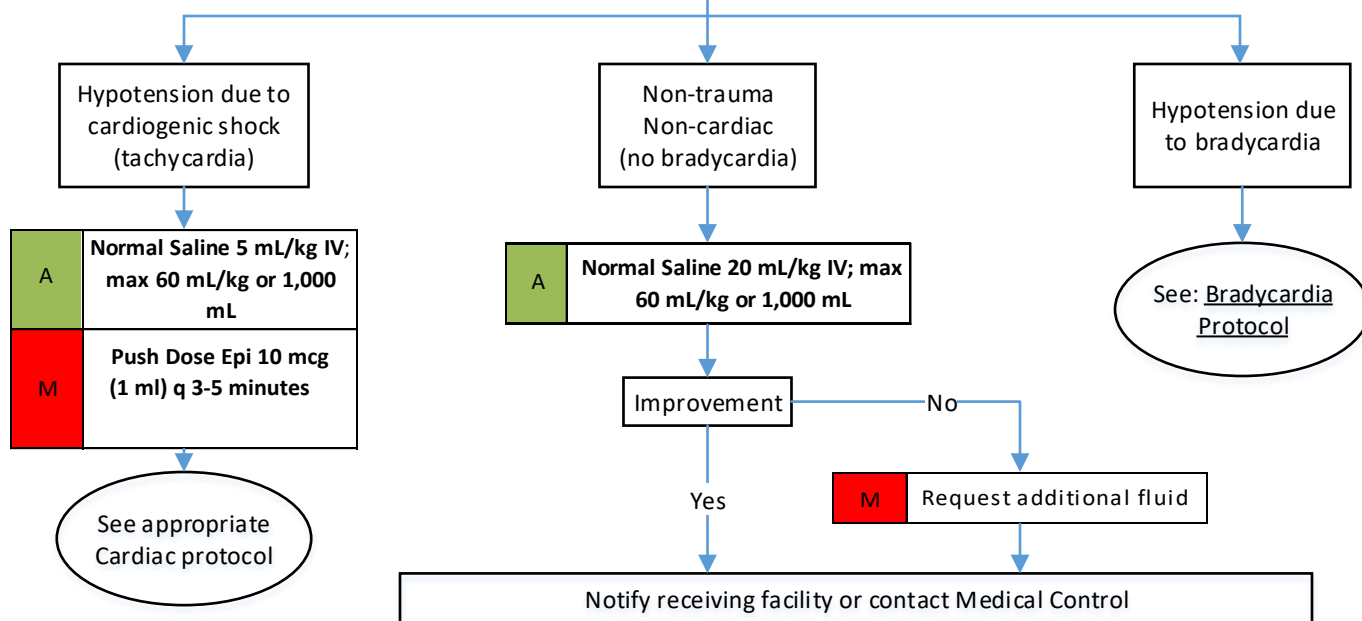
- Restlessness
- Confusion
- Weakness
- Dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Decreased blood pressure

## Differential:

- Shock
- Trauma
- Infection
- Dehydration
- Congenital heart disease
- Medication/toxin
- Allergic reaction

Use age appropriate heart rate and blood pressure levels

F	Oxygen
B	12-Lead EKG
	Obtain BGL
A	Initiate IV



## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- Consider all possible causes of shock and treat per appropriate protocol.
- Consider possible allergic reaction or early anaphylaxis.
- Decreasing heart rate and hypotension occur late in children and are signs of imminent cardiac arrest.
- Work of breathing is a better indicator of oxygenation and ventilation than rate and lung sounds
- Most maternal medications pass through breast milk to the infant. Consider **Naloxone (Narcan) 0.1 mg/kg IV/IO; max 2 mg.**
- If the patient has a history of cardiac disease (e.g., prematurity), chronic lung disease, or renal disease, limit **Normal Saline bolus to 10 mL/kg.**

## Age based SBP hypotension:

- less than 1 year: less than 70
- 1-10 years: less than 70 + (2 x age)
- greater than 11: less than 90 + (2 x age)

## Appearance

- Often the first clue to a problem
- Tone
- Interactiveness
- Consolability
- Look/gaze (eye contact)
- Speech/cry

## Skin circulation

- Reflects overall adequacy of perfusion

## Abnormal audible breath sounds

- **Stridor** - upper airway obstruction
- **Wheezing** - partially blocked small airways
- **Grunting** - lower airway (pneumonia)
- **Retractions** - suprasternal, intercostal, or subcostal
- Nasal flaring
- Positioning

## Abnormal appearance +

**Poor circulation = SHOCK**

**Abnormal appearance + Change in work of breathing = RESPIRATORY FAILURE**

**Normal appearance + Change in work of breathing = RESPIRATORY DISTRESS**

# Pediatric Reactive Airway Disease

9.12

## History:

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

## Significant Findings:

- Wheezing/stridor
- Respiratory retractions
- Increased heart rate
- Altered level of consciousness
- Nasal flaring/tripoding
- Anxious appearance

## Differential:

- Asthma/epiglottitis
- Allergic reaction
- Aspiration/foreign body
- Infection
  - Pneumonia
  - Croup
- Congenital heart disease
- Medication/toxin
- Trauma

Assess severity of symptoms; allow patient to maintain a position of comfort (usually sitting)

F

Oxygen and pulse oximetry

Wheezing

Stridor

A	Combivent (DuoNeb) and/or Albuterol 2.5 mg via nebulizer may repeat Albuterol once to max 5 mg
A	Initiate IV if O <sub>2</sub> <92% after first treatment
M	For severe respiratory distress characterized by difficulty speaking, accessory muscle use, or low O <sub>2</sub> ; request <b>Epinephrine 1:1,000 0.15 mg IM</b>

P	Consider <b>Racemic Epinephrine 0.5 mL (diluted to 3 mL with Normal Saline)</b> via nebulizer, may NOT be repeated
A	Initiate IV if O <sub>2</sub> <92% after first treatment
M	For severe respiratory distress characterized by difficulty speaking, accessory muscle use, or low O <sub>2</sub> ; request <b>Epinephrine 1:1,000 0.15 mg IM</b>

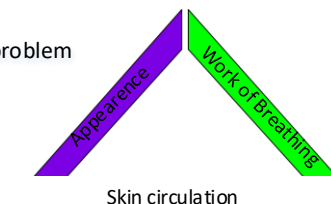
Notify receiving facility or contact Medical Control

## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- **Pulse oximetry** should be monitored continuously if initial saturation is less than or equal to 96%, or there is a decline in patient status despite normal pulse oximetry readings.
- Do not force a child into a position. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control. Avoid direct laryngoscopy unless intubation is imminent.
- Asthma is the most commonly seen obstructive airway disease in pediatric patients, as with adults, asthma causes outflow obstruction (wheezing) because of narrowing of the lower airways.
- Narrowing of the upper airway, as with croup and acute epiglottitis will present with stridor. These patients have the potential to progress to ventilatory failure. Direct visualization of the upper airway of these patients should be limited.
- Bronchiolitis is a viral infection typically affecting infants resulting in wheezing which may not respond to beta-agonists. Consider **Epinephrine** if patient is less than 18 months and not responding to initial beta-agonist treatment.
- Croup typically affects children less than 2 years of age. It is viral, possible fever, gradual onset, no drooling is noted.
- Epiglottitis typically affects children greater than 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 may worsen the condition.**
- Do not mix Combivent (DuoNeb) and 2.5 mg of albuterol in the same nebulizer; if additional medications are needed, administer separately.

## Appearance

- Often the first clue to a problem
- Tone
- Interactiveness
- Consolability
- Look/gaze (eye contact)
- Speech/cry



## Skin circulation

- Reflects overall adequacy of perfusion

## Abnormal audible breath sounds

- Stridor - upper airway obstruction
- Wheezing - partially blocked small airways
- Grunting - lower airway (pneumonia)
- Retractions - suprasternal, intercostal, or subcostal
- Nasal flaring
- Positioning

Abnormal appearance +  
Poor circulation =  
SHOCK

Abnormal appearance + Change  
in work of breathing =  
RESPIRATORY FAILURE

Normal appearance +  
Change in work of breathing =  
RESPIRATORY DISTRESS

Pediatric



# Pediatric Reactive Airway Disease (BLS Only)

9.12B

## History:

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

## Significant Findings:

- Wheezing/stridor
- Respiratory retractions
- Increased heart rate
- Altered level of consciousness
- Nasal flaring/tripoding
- Anxious appearance

## Differential:

- Asthma/epiglottitis
- Allergic reaction
- Aspiration/foreign body
- Infection
  - Pneumonia
  - Croup
- Congenital heart disease
- Medication/toxin
- Trauma

Assess severity of symptoms; allow patient to maintain a position of comfort (usually sitting)

F

Oxygen and pulse oximetry

Wheezing

B

Albuterol 2.5 mg via nebulizer or Combivent (DuoNeb), contact MC to repeat Albuterol once.

A

Initiate IV if O<sub>2</sub> <92% after first treatment

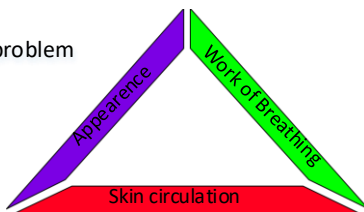
Notify receiving facility or contact Medical Control

## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- **Pulse oximetry** should be monitored continuously if initial saturation is less than or equal to 96%, or there is a decline in patient status despite normal pulse oximetry readings.
- Do not force a child into a position. They will protect their airway by their body position.
- The most important component of respiratory distress is airway control. Avoid direct laryngoscopy unless intubation is imminent.
- Asthma is the most commonly seen obstructive airway disease in pediatric patients, as with adults, asthma causes outflow obstruction (wheezing) because of narrowing of the lower airways.
- Narrowing of the upper airway, as with croup and acute epiglottitis will present with stridor. These patients have the potential to progress to ventilatory failure. Direct visualization of the upper airway of these patients should be limited.
- Bronchiolitis is a viral infection typically affecting infants resulting in wheezing which may not respond to beta-agonists.
- Croup typically affects children less than 2 years of age. It is viral, possible fever, gradual onset, no drooling is noted.
- Epiglottitis typically affects children greater than 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 may worsen the condition.**
- Combivent (DuoNeb) is packaged as 3.5 MG.

## Appearance

- Often the first clue to a problem
- Tone
- Interactiveness
- Consolability
- Look/gaze (eye contact)
- Speech/cry



## Skin circulation

- Reflects overall adequacy of perfusion

## Abnormal audible breath sounds

- Stridor - upper airway obstruction
- Wheezing - partially blocked small airways
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Abnormal appearance +  
Poor circulation =  
SHOCK

Abnormal appearance + Change  
in work of breathing =  
RESPIRATORY FAILURE

Normal appearance +  
Change in work of breathing =  
RESPIRATORY DISTRESS

Pediatric



## History:

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

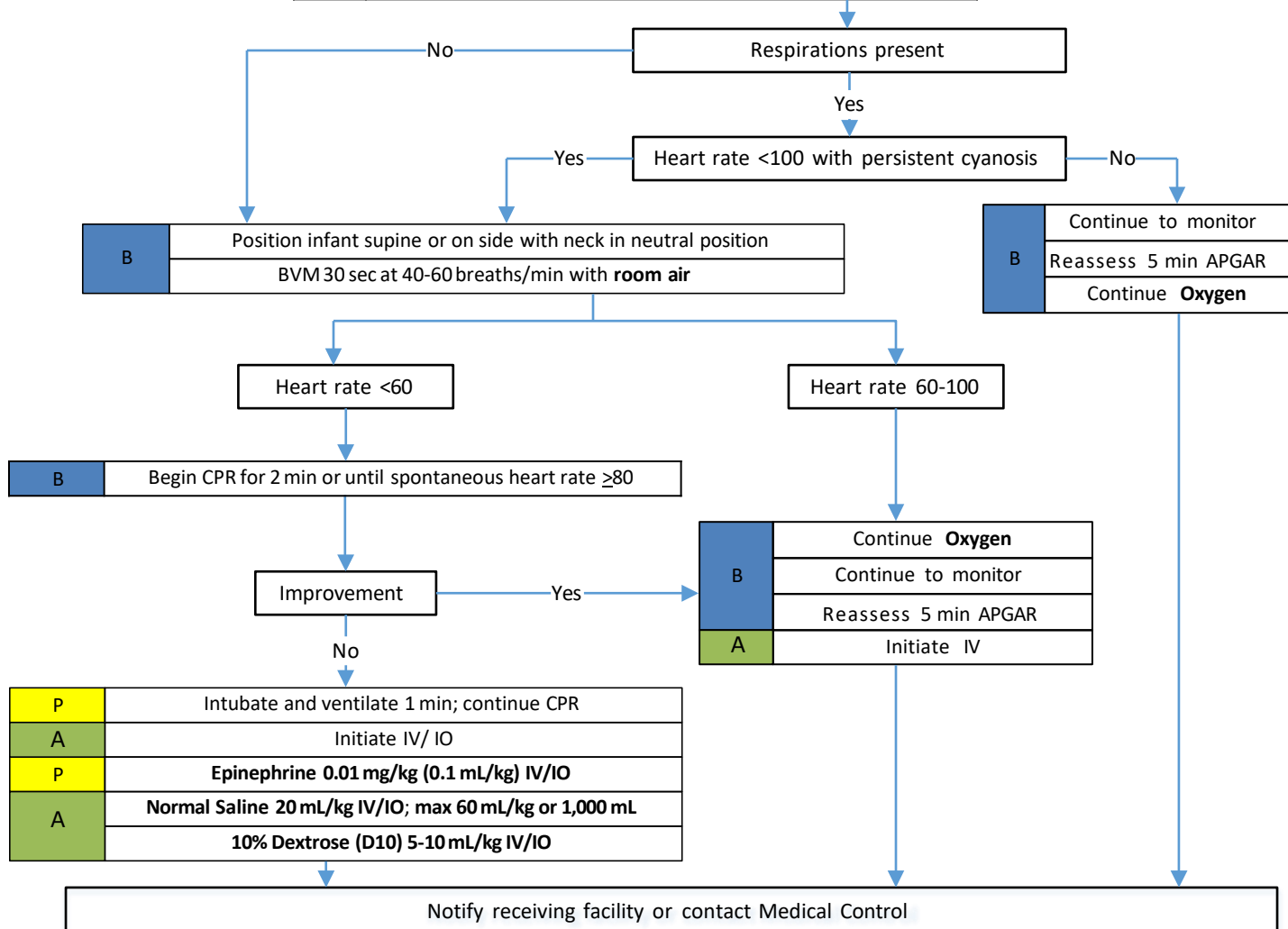
## Significant Findings:

- Respiratory distress
- Peripheral cyanosis/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

B	Suction mouth then nose ( <b>Only if Needed</b> )
	Place neonate immediately on mother's chest, unless extensive resuscitation is anticipated
	Clamp and cut cord after 30-60 seconds
	Record infant APGAR
	Dry the infant; <b>keep infant warm</b>
	Use tactile stimulation to rouse the infant



## PEARLS:

- Neonate = birth to 1 day.
- Maternal sedation or narcotics will sedate the infant.
- CPR 100-120 compressions per minute and at a depth of no less than 1/3 of anterior/posterior diameter of chest with interruptions less than 5 seconds.
- If HR is persistently <60 to consider hypovolemia and pneumothorax as possible easily reversible causes of unsuccessful resuscitations.

# Pediatric Pain Management

9.10

## History:

- Age
- Location
- Duration
- Severity (1 - 10)
- If child use Wong-Baker faces scale
- 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:

- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic

F	<b>Oxygen</b>
A	Initiate IV, INT not acceptable
B	Complete set of vital signs including SaO2

B	Consider <b>Nitrous Oxide</b> *Ages $\geq 5$ years old only
P	Consider <b>Zofran (Ondansetron)</b> up to 4 mg IV/IO/IM
	<b>Morphine</b> 0.1 mg/kg IV/IO/IM; max single dose of 5mg; may repeat once in 5 minutes Max dose of 10 mg *Ages $\geq 5$ years old only
	<b>OR</b>
	<b>Toradol</b> 0.5 mg/kg, Max 15 mg IV/ 30 mg IM
	<b>OR</b>
	<b>Fentanyl</b> 1 mcg/kg slow IV/IO/IM/IN up to 50 mcg; May repeat once in 5 minutes Max dose of 100 mcg *Ages $\geq 5$ years old only
B	Must reassess patient at least every 5 minutes after sedative medication

Notify receiving facility or contact Medical Control

## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- Use Handtevy for drug dosages.
- **Toradol restricted to patients 2 years of age or older. \*OLMC is required for Morphine, Fentanyl, and Nitrous Oxide for ages < 5 years old.**
- **Pain severity (0-10) is a vital sign to be recorded pre, 5 min post, and at disposition with all pain medications.**
- **Age based hypotension:**
  - **less than 1 year:** less than 70 SBP
  - **1-10 years:** less than  $70 + (2 \times \text{age})$  SBP
  - **greater than 11:** less than  $90 + (2 \times \text{age})$  SBP
- **Zofran (Ondansetron)** can cause QT widening. **8-15 kg: Zofran 2 mg IV/IO/IM, >15 Kg 4 mg IV/IO/IM**
- **Contraindications to narcotic use include untreated hypotension, head injury, respiratory distress .**
- **Contraindications to Toradol include active bleed (including ulcer and GI) renal disease, possible surgery.**
- All patients should have drug allergies documented and avoid medications with a history of an allergy or reaction .
- Assess for significant head trauma or GCS less than 13. If present, withhold pain management.
- Maximize the use of non-pharmaceutical pain management techniques (e.g., positioning, padding and splinting, reassurance, heat/cold therapy, etc.) whenever possible.
- All patients receiving prehospital narcotic analgesic or benzodiazepines should have continuous pulse oximetry monitoring , EKG, and non-invasive capnography (if available). All patients who receive IM or IV medications must be observed 15 minutes for drug reaction.
- Stop **Morphine** administration if significant adverse effects (severe nausea, vomiting, signs of poor perfusion, respiratory depression) or sedation (decreased mental status) develop.
- Respiratory depression should be treated with **Oxygen** and ventilatory support if necessary.
- Attempt verbal and tactile stimulation to reverse respiratory depression prior to considering **Naloxone (Narcan)**.
- Administer the smallest possible reversal dose of **Naloxone (Narcan)** to maintain adequate respirations.

Pediatric

# Pediatric Poisoning/Overdose

9.11

## History:

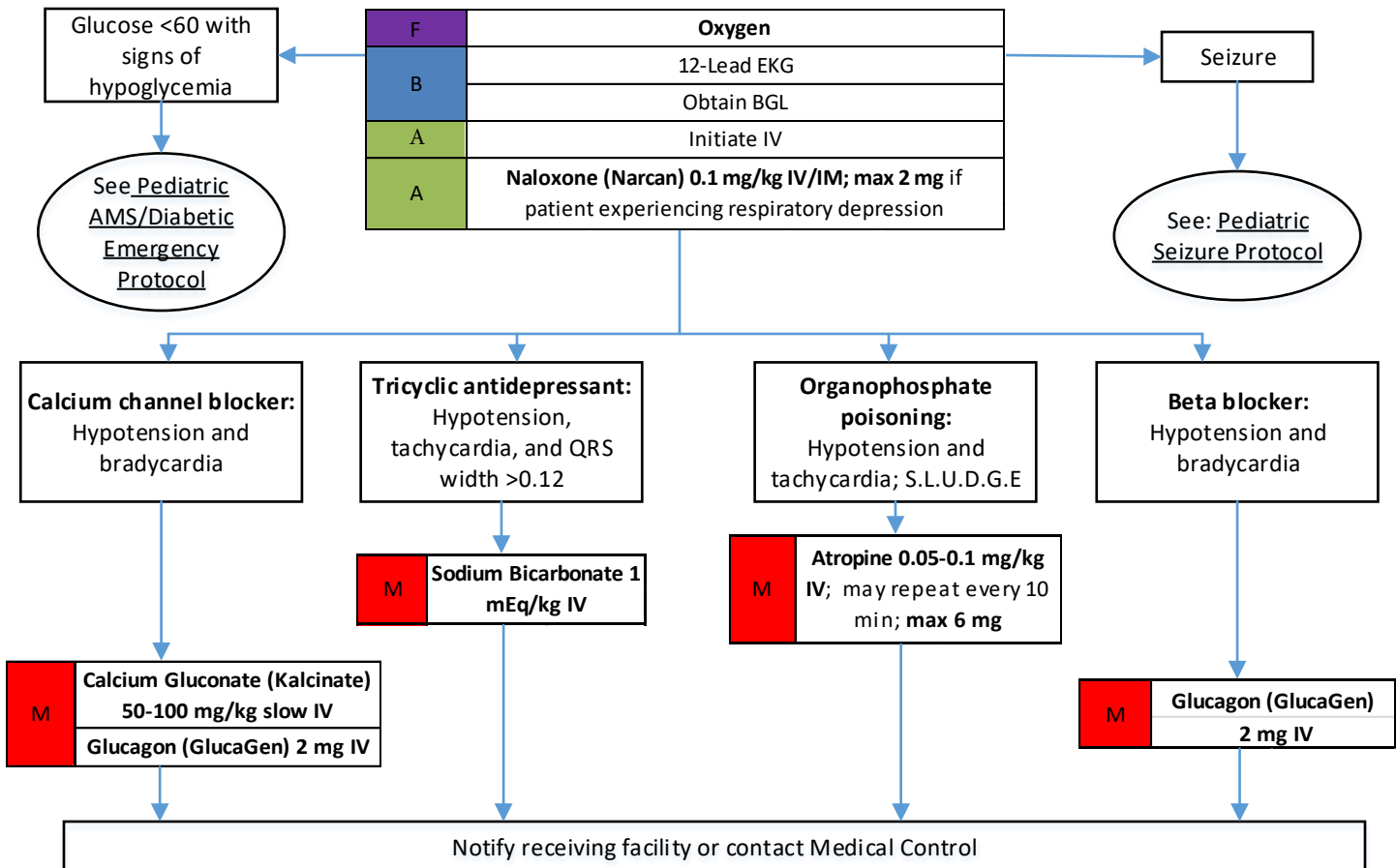
- Past medical history
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason
  - Suicidal
  - Accidental
  - Criminal
- Available medications in home
- Prescribed medications

## Significant Findings:

- Mental status changes
- Hypotension/hypertension
- Decreased respiratory rate
- Tachycardia/dysrhythmias
- Seizures
- S.L.U.D.G.E.
- D.U.M.B.B.E.L.S.

## Differential:

- Tricyclic antidepressants (TCA's)
- Acetaminophen (Tylenol)
- Aspirin
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents/alcohols/cleaning agents
- Insecticides (organophosphates)



## PEARLS:

- Do not rely on patient history of ingestion, especially in suicide attempts. Make sure patient is not carrying other medications or weapons.
- Bring bottles, contents, and emesis to the emergency department.
- **S.L.U.D.G.E.:** **S**alivation, **L**acrimation, **U**rination, **D**efecation, **G**I distress, **E**mesis.
- **D.U.M.B.B.E.L.S.:** **D**iarrrhea, **U**rination, **M**iosis, **B**radycardia, **B**ronchorrhea, **E**mesis, **L**acrimation, **S**alivation.
- **Tricyclic:** 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.
- **Aspirin:** early signs consist of abdominal pain and vomiting. Tachypnea and altered mental status may occur later. Renal dysfunction, liver failure, and or cerebral edema, among other things, can take place later.
- **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 medications:** dysrhythmias and mental status changes.
- **Solvents:** nausea, coughing, vomiting, and mental status changes.
- **Insecticides:** increased or decreased HR, increased secretions, nausea, vomiting, diarrhea, pinpoint pupils.
- **Narcotics/opiates:** decreased HR, decreased BP, decreased respirations, pinpoint pupils.
- Consider restraints if necessary for patient's and/or personnel's protection per the Behavioral Emergency Protocol.

# Pediatric Seizures

9.13

## History:

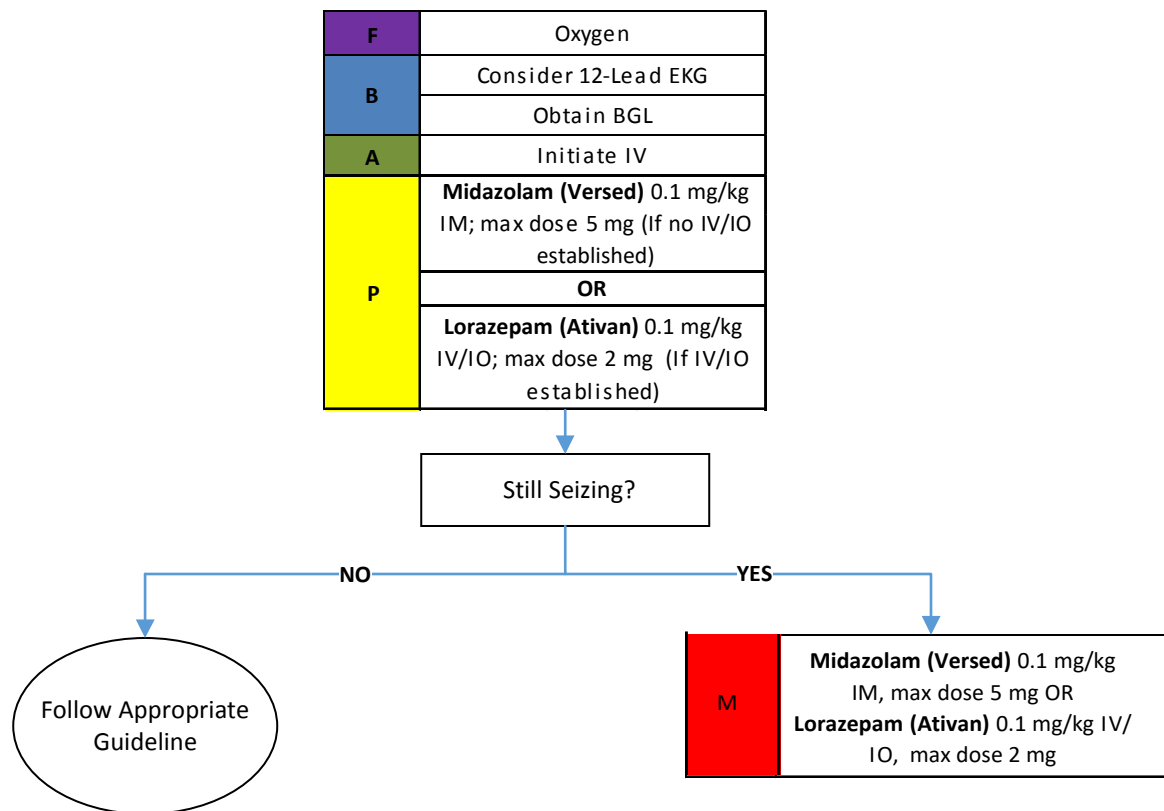
- Reported/witnessed seizure activity
- Previous seizure history
- Seizure medications
- History of recent head trauma
- Fever
- Congenital abnormality
- Consider pregnancy in teenage females

## Significant Findings:

- Decreased mental status
- Sleepiness
- Observed seizure activity
- Hot, dry skin/hyperthermia

## Differential:

- CNS (head) trauma
- Tumor
- Hypoxia/respiratory failure
- Drugs/medications
- Fever
- Infection
- Metabolic abnormality/acidosis



Notify receiving facility or contact Medical Control

## PEARLS:

- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **Use Handtevy for drug dosages.**
- **Addressing the ABC's and verifying blood glucose is more important than stopping the seizure.**
- **Avoiding hypoxemia is extremely important.**
- Abnormal eye movements are most common sign of seizures in neonates.
- Remember to look for evidence of trauma and treat accordingly.
- **Status epilepticus** is defined as two or more successive seizures without a period of consciousness or recovery. This includes failure to return to consciousness greater than 5 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 do not usually result in a loss of consciousness.
- **Jacksonian seizures** are seizures which start as a focal seizure and become generalized.
- Be prepared to assist ventilations especially if **Midazolam (Versed)** is used.
- If evidence or suspicion of trauma, spine should be immobilized.
- In an infant, a seizure may be the only evidence of a closed head injury.
- If family has Diastat on scene, Paramedics may give per medication instructions.

## Mechanism of Injury / Nature of Illness

### Patients $\geq$ age 2 with:

- Signs of massive hemorrhage
- Traumatic injury (penetrating or blunt)
- Suspected dissecting / rupturing aneurysm (abdominal or thoracic)
- GI bleeding
- Signs of intra-abdominal bleeding

## Physiological Parameters:

- Pediatric patients whose VS are consistent with blood loss as defined by their weight or age-based parameters in the Pediatric Trauma Criteria =
  - 2-10 yrs: Systolic BP  $\leq 70 + 5x$  (age in years) up to 10 years
  - Utilize Handtevy app

## Required Documentation:

In Flowchart, document Rh type, amount, unit lot number, and expiration date for EVERY unit administered to the patient

If patient  $\geq 2$  y/o with **Mechanism of Injury / Nature of Illness AND 2 Physiological Parameters**  
\*Follow Blood Administration Checklist\*

Inter-Facility

**Follow MD Order for Type & Cross Matched Blood**  
(Follow Hospital Guidelines)

B	Warm Patient
M	Contact OLMC and request to administer <b>10 mL/kg of Unit O+ WHOLE BLOOD</b>

Continuously monitor patient through all phases of transport

NO

Monitor for Transfusion Reaction

YES

**STOP INFUSION!**  
follow **COG 7.2 Anaphylaxis**

Notify receiving facility or contact Medical Control and alert "Code Transfusion"

(CONTINUED ON NEXT PAGE)

Pediatric

## PEARLS:

**\*\*FOR ANY PEDIATRIC PATIENT RECEIVING BLOOD, PROVIDERS MUST CONTACT OLMC FOR ORDERS AND DOCUMENT WHO THEY NOTIFIED ON THEIR ePCR\*\***

- **Pediatric = 2 year to less than age 12. Ages  $\geq$  12 years old, refer to the adult blood COG's.**
- Prime blood tubing and warmer. Tubing should be changed after 2 Units if possible, or as manufacturer recommends. Care should be taken to prevent hypothermia.
- Monitor patients for signs and symptoms of transfusion reaction and adverse effects, including temperature at time of infusion and 15 minutes after start.
- Consider any fluid overload issues such as CHF or patient weight (pediatrics), and monitor for signs and symptoms appropriately.
- **Allergic reaction (onset <15 min)** - Mild skin itching or hives < 25% body, Temp 38C (100.4F) or change of >1C (>2F) from pre-transfusion value, chills, and hives/rash >25% body
- **Febrile transfusion reactions:** - Temp 38C (100.4F) or change of >1C (<1.8F) from pre-transfusion value, chills, headache, facial flushing, palpitations, cough, chest tightness, increased pulse rate and/or flank pain
- **Hemolytic transfusion reaction:** - Immediate lysis of transfused blood can result in fever and/or tachycardia. Other symptoms can include chills, back/flank pain, nausea/vomiting, dyspnea, flushing, bleeding, and/or hypotension. Begin aggressive NS 0.9%/LR treatment
- **Dilutional thrombocytopenia** - This is generally not seen with infusion of 1 – 2 units, unless patient has pre-existing thrombocytopenia or disseminated intravascular coagulation.
- **Potassium intoxication (hyperkalemia)** - Symptoms can include flaccidity, muscle twitching, bradycardia, EKG changes (tall peaked T waves, prolonged P-R interval, absent P waves, prolonged QRS) and/or cardiac arrest.
- **Hypocalcemia: (from citrate toxicity that binds Ca)** - Symptoms can include arrhythmias, hypotension, muscle cramping, nausea, vomiting, seizure activity, and/or tingling sensation in the fingers. Patient with acute or chronic hepatic insufficiency are at relatively higher risk of citrate toxicity.
- **FOR ANY REACTION, STOP THE INFUSION, REMOVE ALL TUBING AND PRODUCT FROM THE PATIENT AND SAVE ALL EQUIPMENT. FLUSH IV LINE.**
- Contact Medical Control for additional boluses as necessary

## BLS

1. Begin Initial Medical Care.
2. Follow Airway Management Protocol.
3. Consider **oxygen administration**.
4. Record **LOC** using **AVPU** method. Obtain an initial GCS as early as possible.
5. Control all significant external bleeding. If direct pressure does not rapidly stop the bleeding in an extremity, apply a tourniquet. **See Tourniquet protocol.**
6. **Direct pressure** is the method of choice to control bleeding.
7. If bleeding continues despite tourniquet use or wound is not amenable to tourniquet placement (e.g. groin or armpit), **pack the wound cavity** with a sterile gauze roll and apply direct pressure with a pressure bandage.
8. Providers may also utilize a **TCCC-approved gauze based hemostatic dressing** (e.g., Combat Gauze,) if available. See Wound Packing protocol.
9. The **number of dressings** packed into the wound must be documented in the **patient care record**.
10. During assessment, if unstable pelvis is noted, **see Pelvic Binder protocol**.
11. Expose patient to perform a detailed physical exam.
12. Cover and keep patient warm between assessments in order to conserve body heat.
13. If patient's presentation, or the mechanism of injury, meets **Trauma Alert Criteria**:
14. Call for a paramedic unit. If transport time is less than ALS unit arrival, start transport as soon as possible.
15. **Rapidly extricate** with **cervical spine immobilization**.
16. Try to keep scene time to **10 minutes or less**. If scene time exceeds 10 minutes, document the reason for the delay.
17. Patients with major multiple system trauma or penetrating trauma to the head, neck, chest or abdomen should be transported to a Trauma Center. Patients with serious burns should consider ATU for direct transport to a Burn Center. If the patient can be transported by BLS to a Trauma Center in less time than it would take for ALS to arrive, then transport by BLS.

## ALS

17. During transport – Establish 2 large bore IV's of 0.9% NaCl. Titrate fluids to a SBP of 90 mmHg.
18. Consider administering blood products if available.
19. Apply cardiac monitor.
20. Intubation with C-spine control may be necessary to maintain a patent airway and/or to prevent aspiration of vomitus. Do not nasally intubate patients with facial trauma.
21. If an IV cannot be established and an urgent need for vascular access exists, establish IO access.

## History:

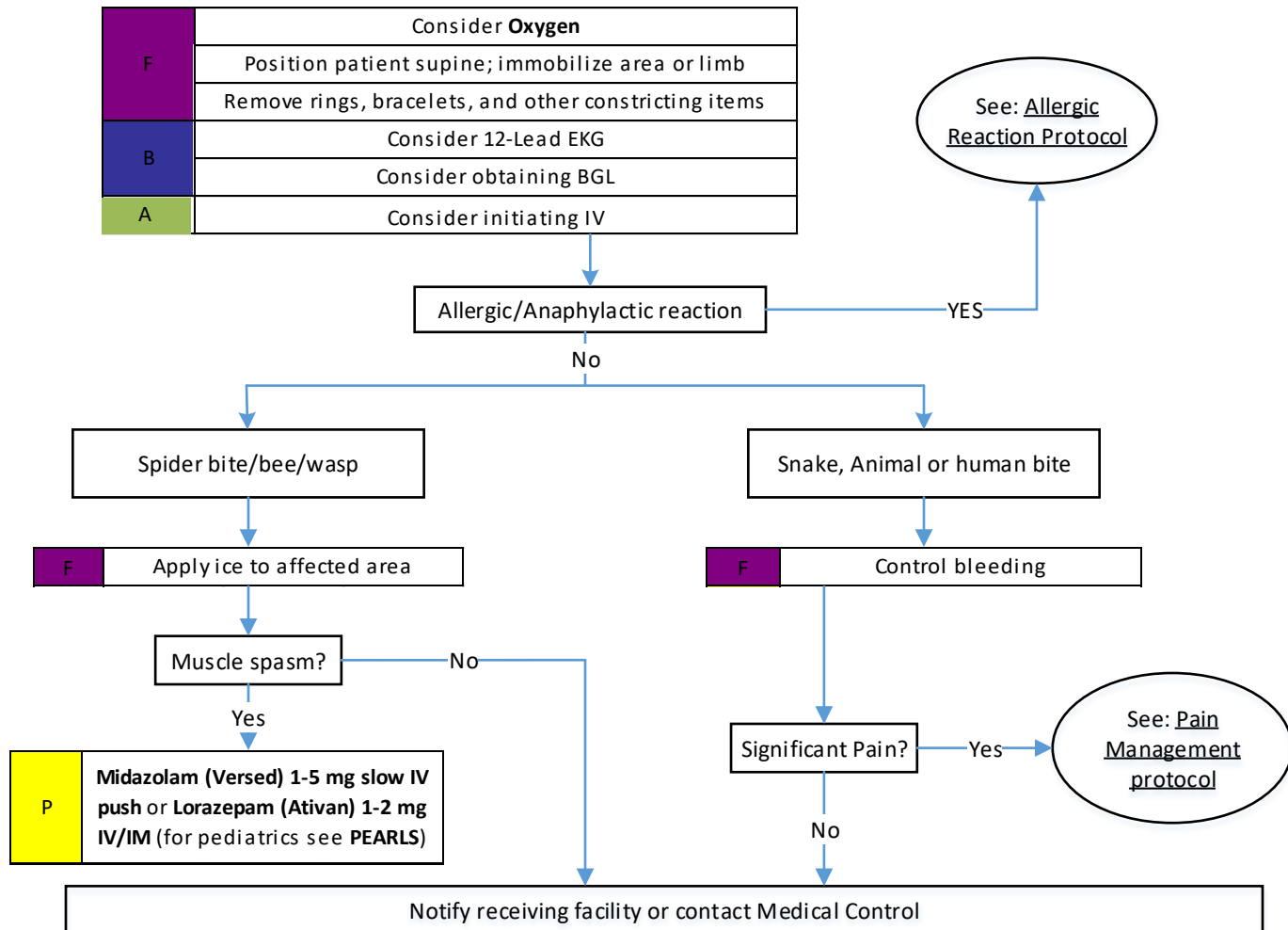
- Type of bite/sting
- Bring description or photo with patient for identification
- Time, location, size of bite/sting
- Previous reaction to bite/sting
- Domestic vs. wild
- Tetanus and rabies risk
- Immunocompromised patient

## Significant Findings:

- Rash/broken skin/wound
- Pain
- Soft tissue swelling
- Redness
- Blood oozing from the bite wound
- Evidence of infection
- Shortness of breath/wheezing
- Allergic reaction/hives/itching
- Hypotension/shock

## Differential:

- Animal/human bite
- Snake/spider bite
- Insect sting/bite
  - Bee
  - Wasp
  - Ant
  - Tick
- Infection risk



## PEARLS:

- For pediatrics muscle spasms, call Medical Control prior to **Midazolam (Versed)** or **Lorazepam (Ativan)** administration.
- Human bites have higher infection rates 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*).
- An **animal bite incident report** must be made to SC DHEC if the patient is not transported by EMS and animal control is not on-scene.
- Poisonous snakes in this area are generally of the pit viper family: rattlesnake, copperhead, and water moccasin.
- **Coral snake** bites are rare: Very little pain but very toxic. "Red on yellow - kill a fellow, red on black - venom lack."
- **Black widow spider** (black spider with red hourglass on belly): Bites tend to be minimally painful, but over a few hours, muscular pain and severe abdominal pain may develop.
- **Brown recluse spider** (brown spider with fiddle shape on back): 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.
- Envenomation is generally worse with larger snakes and early in spring. If no pain or swelling, envenomation is unlikely (except for coral snakes).
- Evidence of infection: swelling, redness, drainage, fever, red streaks proximal to wound.
- Immunocompromised patients (i.e. diabetes, chemotherapy, transplant patients) are at an increased risk for infection.



## History:

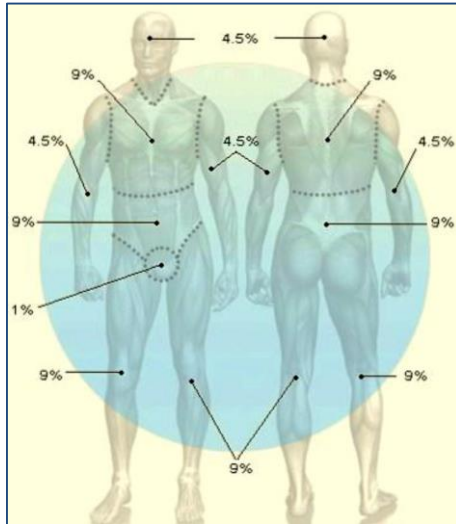
- Exposure to heat/gas/chemical
- Inhalation injury
- Time of Injury
- Past medical history
- Medications
- Other trauma
- Loss of consciousness
- Tetanus/immunization status

## Significant Findings:

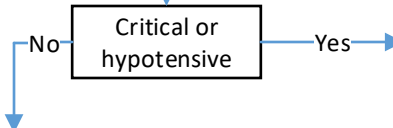
- Pain
- Swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress
- Singed facial or nasal hair
- Hoarseness/wheezing

## Differential:

- Superficial (1st°): red and painful (don't include in TBSA)
- Partial thickness (2nd°): blistering
- Full thickness (3rd°): painless, charred or leathery skin
- Thermal/chemical/electrical/radiation



F	Oxygen
	Consider Spinal Immobilization
	Fly critical and serious burns to a burn center if possible
	If eye involvement flush with continuous water or <b>Normal Saline</b>
	Remove rings, bracelets, and other constricting items
	Protect burns/wounds with sterile dressing; do not attempt to remove clothing that is adhered to the burn area
B	Identify entry and exit sites; apply sterile dressings
Consider 12-Lead EKG	



A	Initiate <b>IV/IO</b> of <b>Normal Saline</b> (4 x kg x % TBSA burned); <b>up to 3,000 mL</b>
	Pediatric patients: <b>Normal Saline 20 mL/kg IV/IO; max 60 mL/kg or 1,000 mL</b>

Notify receiving facility or contact Medical Control

Critical

Serious

Minor

>15% TBSA  
2nd°/3rd° burn  
Burns with definite airway compromise  
Burns with multisystem trauma

5-15% TBSA 2nd°/3rd°  
3rd° with >5% TBSA  
Suspected inhalation injury  
Circumferential extremity burn  
Electrical or chemical  
Face, hands, perineum or feet  
Hypotension or GCS ≤13

<5% TBSA 2nd°/3rd°  
No inhalation injury  
No intubation needed  
Normotensive  
GSC ≥13

## PEARLS:

- Serious, critical, and circumferential burns should be transported directly to a burn center by ATU whenever feasible.
- Burn patients are trauma patients. Evaluate for multisystem trauma. Most injuries immediately seen will be a result of collateral injury such as heat from the blast, trauma from concussion, etc.. Treat collateral injury based on typical care for the type of injury displayed.
- Assure whatever has caused the burn is no longer contacting the injury. **Stop the burning process!**
- Early intubation is required when the patient experiences significant inhalation injuries.
- Potential CO exposure should be treated with **100% Oxygen** and transported to the closest appropriate facility.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burns. Maintain body heat.
- Evaluate the possibility of child abuse with children and burn injuries.
- Chemical burns:** Remove chemical first if possible. Flush as soon as possible with the cleanest readily available water or saline solution using copious amounts of fluids.
- Electrical:** Attempt to locate contact points, (entry wound where the AC source contacted the patient, an exit at the ground point) both sites will generally be full thickness.
- If able, 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.
- Anticipate ventricular or atrial irregularity, to include V-tach, V-fib, heart blocks, etc.
- Radiation:** Determine the exposure type: external irradiation, external contamination with radioactive material, internal contamination with radioactive material. If available, determine exposure (generally measured in Grays/GY).

## History:

- Time of injury
- Type of injury
- Mechanism (blunt vs. penetrating)
- Open vs. closed wound/fracture
- Wound contamination
- Medical history
- Medications
- Tetanus history
- Evidence for multi-trauma
- Loss of consciousness

## Significant Findings:

- Pain
- Swelling/bleeding
- Respiratory distress/failure
- Altered sensation/motor function distal the injury
- Diminished pulse/capillary refill distal the injury
- Major traumatic mechanism of injury
- Seat belt markings
- Abdominal distention

## Differential:

- Hollow/solid organ trauma
- Grey Turner's sign (bruising at flanks)
- Cullen's sign (bruising around navel)
- Referred pain (caused from the brain's inability to localize area of irritation)
- Parietal pain (caused by irritation to the parietal peritoneal wall)
- Visceral pain (caused from acute stretching of the structure's wall)

F	Oxygen
	Limit scene time to 10 min
A	Initiate IV

Penetrating

Blunt

B	Consider Spinal Immobilization only if neurological deficit
A	Just enough <b>Normal Saline IV</b> to maintain a radial pulse (MAP of 60)
F	Vented chest seals if indicated
P	Consider pleural decompression

B	Consider Spinal Immobilization
A	Just enough <b>Normal Saline IV</b> to maintain a radial pulse (MAP of 60)
P	Consider pleural decompression

Notify receiving facility or contact Medical Control

## PEARLS:

- Solid abdominal organs: lungs, liver, spleen, kidneys, pancreas. Presents with constant pain. May be referred.
- Hollow organs: heart, stomach, intestines, bladder, gall bladder, uterus, diaphragm, appendix. Presents with visceral, parietal or referred pain. Pain presents as intermittent ache or cramp or sharp, pinpoint pain.
- Notify Greenville Memorial as soon as possible with BP (or hemodynamic stability), airway status (patent, unstable or secured), MOI, GCS and ETA.
- See Trauma alert activation standard policies 1.13 for alert criteria.

**History:**

- Previous medical history
- Medications
- Drugs
- Entrapment/crushing >1 hour

**6 P's**

- Pain
- Pallor/Paleness
- Pulselessness
- Paralysis
- Paresthesia (tingling or burning sensation on skin)
- Poikilothermia (cool to touch)

**Significant Findings:**

- Entrapment/crushing of one or more large muscle extremity
- Entrapment/crushing of pelvis
- Absent pulse in extremity
- Delayed capillary refill
- Blanched skin in affected extremity
- Diminished sensation
- Extremity cold to touch

**Differential:**

- Rhabdomyolysis
- Drug overdose
- Compartment syndrome
- Hyperthermia
- Spinal trauma

F	Oxygen
B	12-Lead EKG
A	Initiate IV
	Normal Saline up to 1,000 mL IV

Signs of hyperkalemia (peaked T waves and QRS >0.12)

No

Yes

P	Calcium Gluconate 10-20 mL IV followed by Normal Saline 100 mL IV and Sodium Bicarbonate 1 mEq/kg IV
	If IV unavailable, Albuterol (Ventolin) 5mg via nebulizer

See: Pain Management protocol

See: Pain Management protocol

Notify receiving facility or contact Medical Control

**PEARLS:**

- Fluid administration should be conducted prior to patient extrication.
- Treatment may be compromised by confined space or MCI situation. Ideally, start treatment prior to release of compression.
- Patients may become hypothermic even in warm environments.
- Other injuries can cause compartment syndrome such as circumferential burns, pulmonary embolus, thrombosis, severe edema, etc.

## History:

- Submersion in water regardless of depth
- Possible trauma to C-spine
- Possible history of trauma (i.e., diving board)
- Duration of immersion
- Temperature of water or possibility of hypothermia

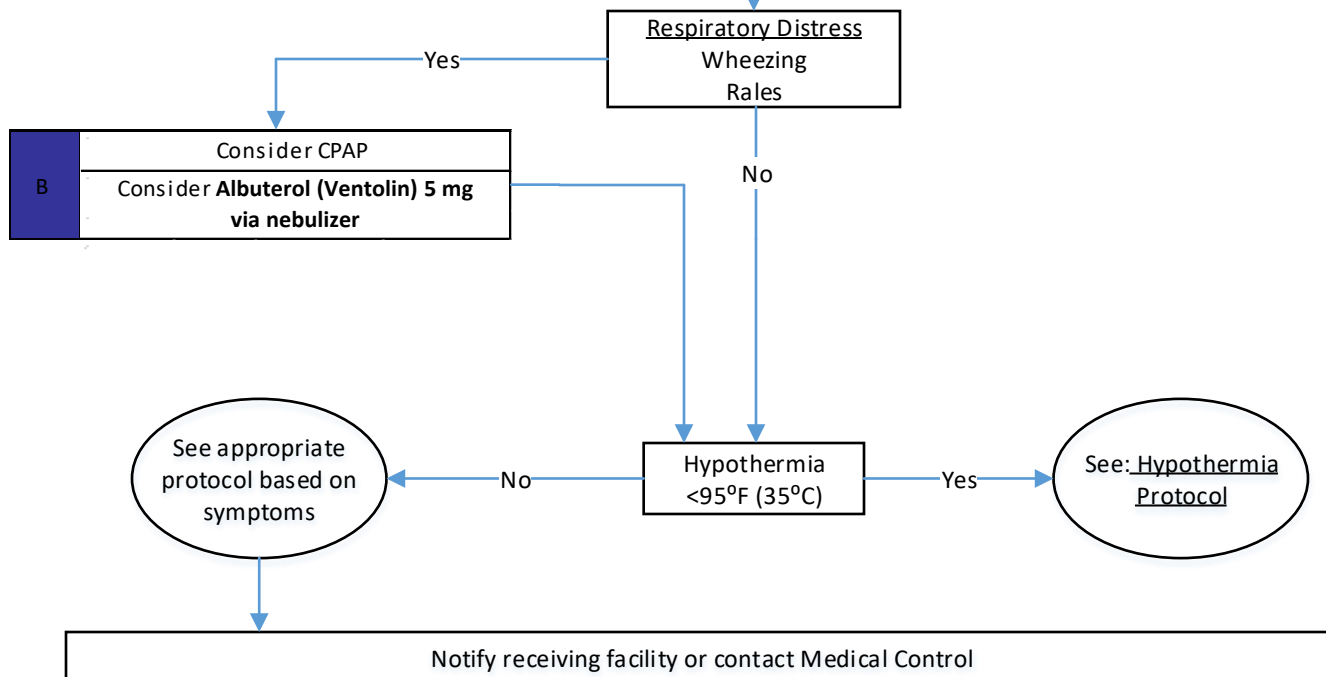
## Significant Findings:

- Unresponsive
- Mental status changes
- Decreased/absent vital signs
- Vomiting
- Coughing
- Apnea
- Stridor
- Wheezing
- Rales

## Differential:

- Trauma
- Pre-existing medical problem
- Pressure injury (i.e., diving)
- Barotrauma
- Decompression sickness
- Post-immersion syndrome
- Hypothermia

F	Oxygen
	Consider Spinal Immobilization
	Remove all wet clothing
B	Re-warm
	12-Lead EKG
A	Obtain BGL
	Initiate IV



## PEARLS:

- Drownings have a high index of suspicion for possible spinal injuries.
- **Regardless of water temperature – resuscitate all patients with known submersion time of ≤ 30 minutes.**
- **If submersion time ≥ 90 minutes consider moving to recovery phase instead of rescue, unless water temperature is <43 degF.**
- Some patients may develop delayed respiratory distress.
- 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), contact **Divers Alert Network at 1-919-684-9111** for guidance.
- Consider hypothermia in all drownings.
- Transport should be strongly advised on all patients who's head was submerged underwater.

## History:

- Type of injury
- Mechanism
  - Crush
  - Penetrating
  - Amputation
- Time of injury
- Open vs. closed wound/fracture
- Wound contamination
- Medical history
- Medications
- Tetanus history

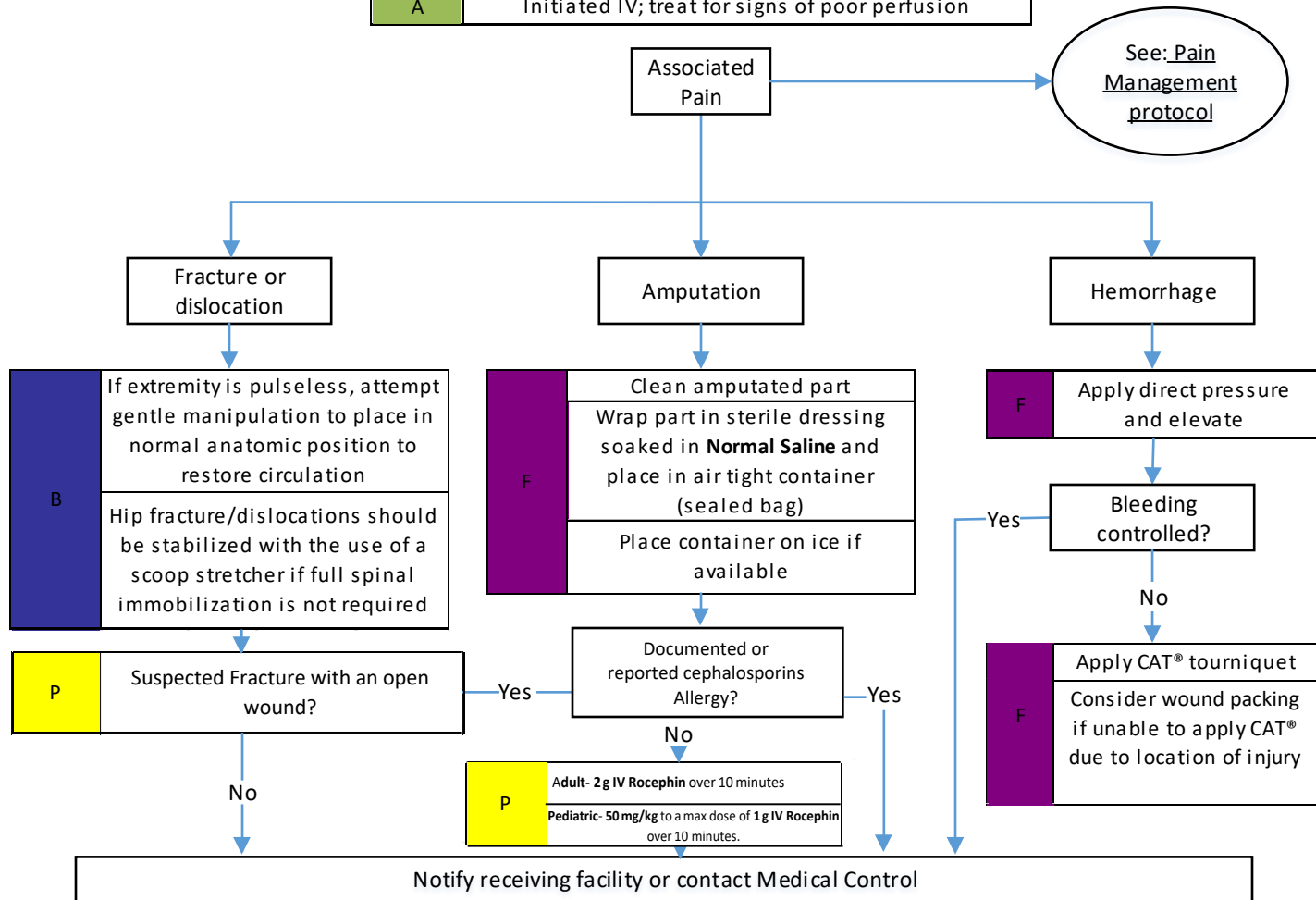
## Significant Findings:

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

## Differential:

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

F	Assess for pulse, sensory, and motor function
	<b>Oxygen</b>
A	Initiated IV; treat for signs of poor perfusion



## PEARLS:

- Peripheral neurovascular status is important.
- **In amputations, time is critical.** Transport and notify Medical Control immediately so that the appropriate destination can be determined.
- 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.
- Lacerations must be evaluated for repair within 6 hours from the time of injury.
- Splint injured extremities in the position found unless the extremity is pulseless or manipulation is required for extrication.
- Femur fractures should be managed with a traction splint unless hip fracture or shock is present and emergent transport is required.
- Direct pressure and elevation are inadequate in controlling severe bleeding. Utilize a tourniquet if direct pressure to the wound fails to control extremity hemorrhage.
- For uncontrolled hemorrhage in shoulder and groin consider wound packing. Apply direct pressure and **DON'T LET GO!**

## History:

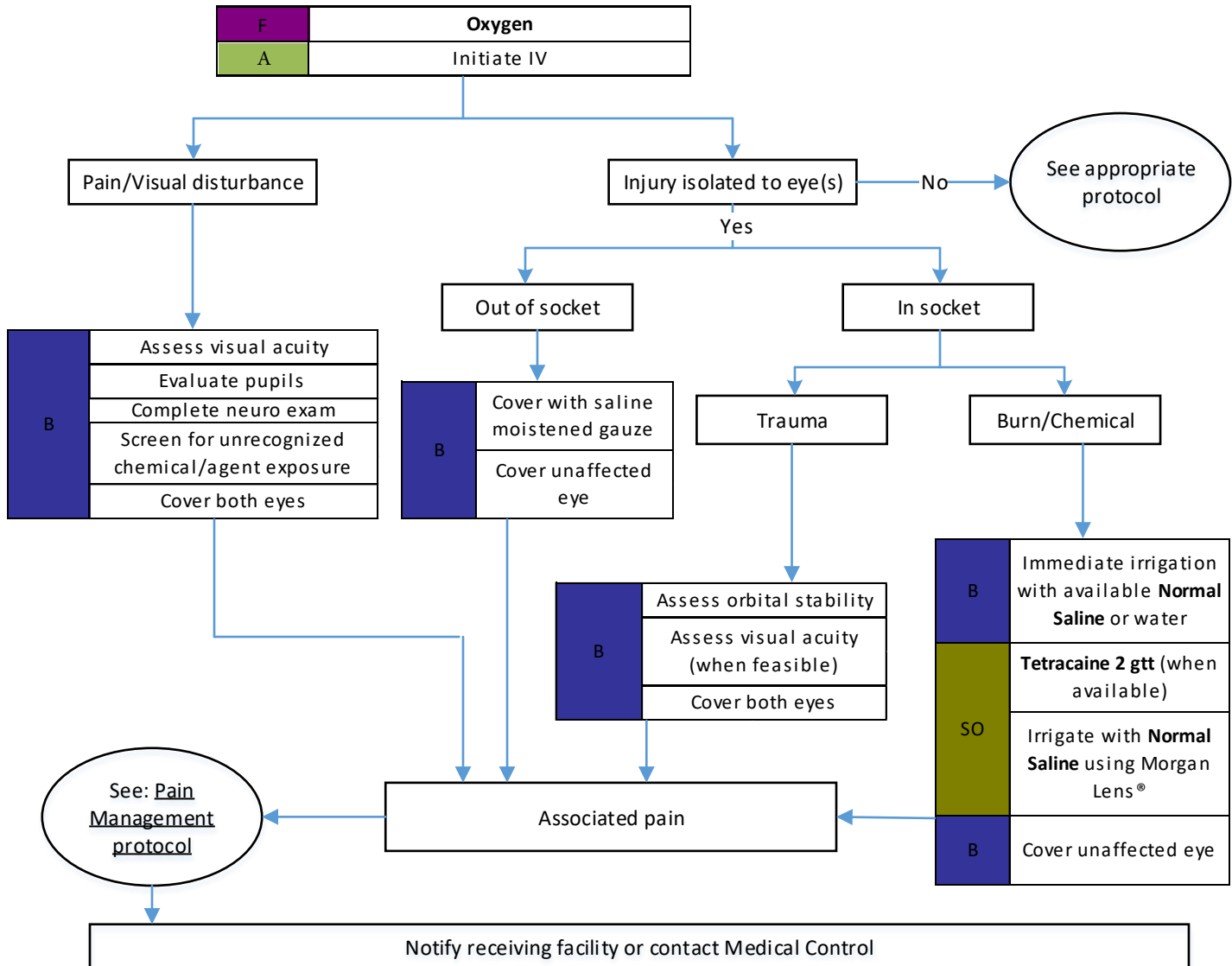
- Time of injury/onset
- Blunt/penetrating/chemical
- Open vs. closed injury
- Wound contamination
- Medical history
- Medications
- Tetanus history
- Involved chemicals
- Material safety data sheet (MSDS)
- Normal visual acuity

## Significant Findings:

- Pain
- Swelling/bleeding
- Deformity/contusion
- Visual deficit
- Leaking aqueous/vitreous humor
- Upwardly fixed eye
- "Shooting" or "streaking" light
- Visible contaminants
- Rust ring
- Lacrimation

## Differential:

- Abrasion/laceration
- Globe rupture
- Retinal nerve damage/detachment
- Chemical/thermal burn/agent of terror
- Orbital fracture
- Orbital compartment syndrome
- Neurological event
- Acute glaucoma
- Retinal artery occlusion



## PEARLS:

- Normal visual acuity can be present even with severe eye injury.
- Remove contact lens whenever possible.
- Any chemical or thermal burn to the face/eyes should raise suspicion of respiratory insult.
- Orbital fractures raise concern of globe or nerve injury and need repeated assessments of visual status.
- Always cover both eyes to prevent further injury.
- Use shields, not pads, for physical trauma to eyes. Pads are okay for unaffected eye.
- Do not remove impaled objects.
- Suspected globe rupture or compartment syndromes require emergent in-facility intervention.
- Patient should be placed in fowlers position with any suspected globe injury.

## History:

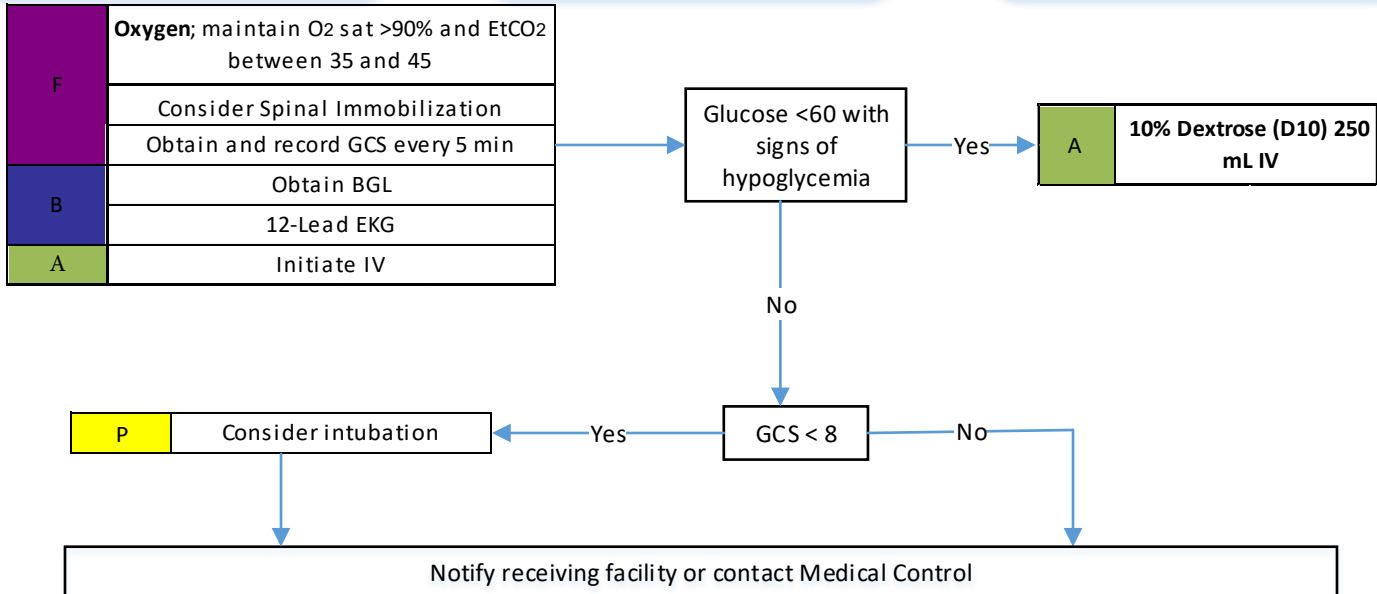
- Time of injury
- Mechanism (blunt vs. penetrating)
- Loss of consciousness
- Bleeding
- Past medical history
- Medications
- Evidence for multi-trauma

## Significant Findings:

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

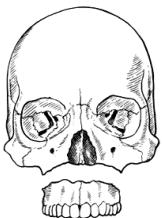
## Differential:

- Skull fracture
- Brain injury
  - Concussion
  - Contusion
  - Hemorrhage
  - Laceration
- Epidural/subdural hematoma
- Subarachnoid hemorrhage
- Spinal injury



## PEARLS:

- If GCS is less than 12 consider air/rapid transport.
- In the absence of capnography, hyperventilate the patient (adult: 20 breaths/min, child: 30 breaths/min, infant: 35 breaths/min) only if ongoing evidence of brain herniation (blown pupil, decorticate or decerebrate posturing, or bradycardia).
- 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.
- Consider restraints if necessary for patient's and/or personnel's protection per the **Behavioral Emergencies/Chemical Restraint Protocol**.
- Limit IV fluids unless patient is hypotensive.
- 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 as soon as possible.
- In areas with short transport times, RSI/drug-assisted intubation is not recommended for patients who are spontaneously breathing and who have oxygen saturations greater than 90% with supplemental oxygen.

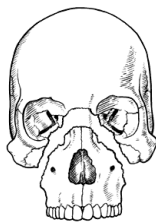


Le Fort I

## Significant Findings:

### Le Fort I

- Slight swelling
- Maxilla moves independently of the rest of the face
- Possible malocclusion

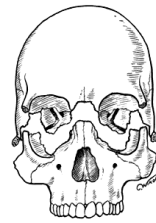


Le Fort II

## Significant Findings:

### Le Fort II

- Massive edema, malocclusion
- Nose is obviously fractured
- Cerebrospinal fluid leak possible



Le Fort III

## Significant Findings:

### Le Fort III

- Massive edema
- Mobility of zygoma, orbital rim
- Anesthesia of cheek possible
- Diplopia (without blowout fx of orbit)
- Depression of cheek bone
- Open bite
- Cerebrospinal leak possible

**History:**

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

**Significant Findings:**

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

**Differential:**

- Fever (infection)
- Dehydration
- Medications/drugs
- Hyperthyroidism (storm)
- Delirium tremens (DT's)
- Heat cramps
- Heat exhaustion
- Heat stroke
- CNS lesions/tumors

F	<b>Oxygen</b>
	Document patient temperature
	Remove from heat source
	Remove clothing
	Apply room temperature water to skin and increase air flow around patient
	Utilize cold water submersion if a dunk tank is available
B	Consider ice packs to groin and axillae
	12-Lead EKG
A	Obtain BGL
	Initiate IV

Notify receiving facility or contact Medical Control

**PEARLS:**

- 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.
- 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 and is not associated with an elevated temperature.
- **Heat exhaustion** consists of dehydration, salt depletion, dizziness, fever, mental status changes, headache, cramping, nausea and vomiting. Vital signs usually consists of tachycardia, hypotension, and an elevated temperature.
- **Heat stroke** consists of dehydration, tachycardia, hypotension, temperature greater than 104°F (40°C), and an altered mental status.



## History:

- Past medical history
- Medications
- Estimated downtime

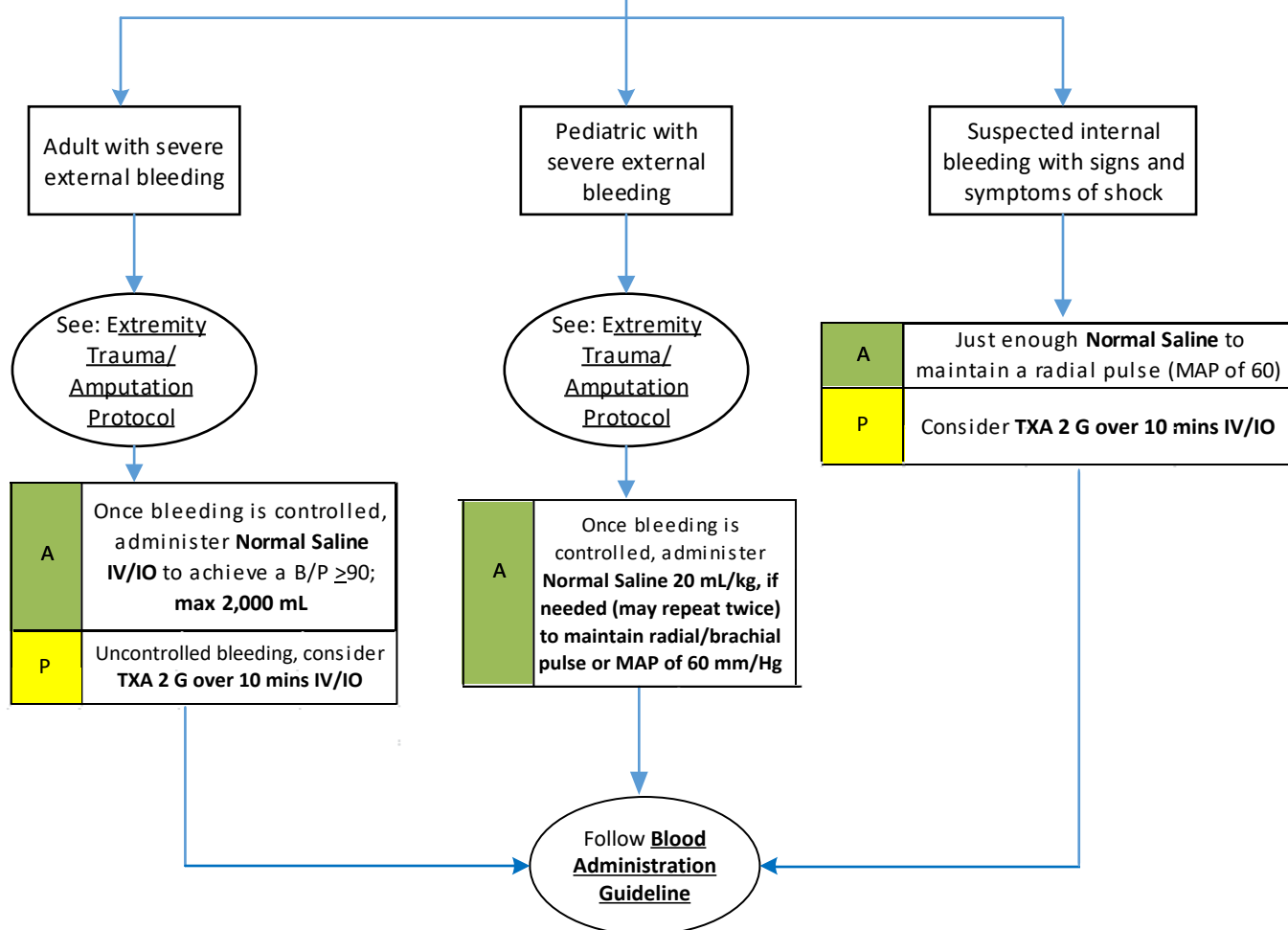
## Significant Findings:

- Restlessness/confusion
- Weakness/dizziness
- Weak, rapid pulse
- Pale, cool, clammy skin
- Delayed capillary refill
- Altered mental status

## Differential:

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

	RAPID TRANSPORT
F	Oxygen
B	Consider Spinal Immobilization
A	Activate Trauma alert
A	Initiate IV/IO; place 2nd IV/IO when feasible



Notify receiving facility or contact Medical Control

## PEARLS:

- Notify trauma center of the START triage category as soon as possible. When en-route notify trauma center of GCS, major area of injury or mechanism of hypovolemia, and anticipated ETA.

## Mechanism of Injury / Nature of Illness:

Signs of massive hemorrhage  
Traumatic injury (penetrating or blunt)

## Physiological Parameters:

- Systolic (SBP) < 90 mm Hg
  - HR > 120 bpm
  - Shock Index (SI)  $\geq 0.9$
- Definitions:**
- Shock Index (SI) : HR divided by SBP = SI

## Required Documentation:

In ePCR, document Rh type, amount, unit lot number, patients temp, and expiration date for EVERY unit administered to the patient

If patient with **Mechanism of Injury / Nature of Illness**  
**AND 2 Physiological Parameters**  
\*Follow Blood Administration Checklist\*

Is the Patient a  
Female <50 y/o?  
(Childbearing Age)

YES

NO

B	Warm Patient
M	Contact OLMC and request to administer <b>1 Unit O+ WHOLE BLOOD</b>

B	Warm Patient
P	Administer <b>1 Unit O+ WHOLE BLOOD</b>

Continuously monitor  
during transport for  
changes

Continuously monitor  
during transport for  
changes

Traumatic injury *excluding* GI or OB Hemorrhage?  
**AND**  
Initial injury < 3 hours old?

NO

YES

NOT Improved?

Improved?

If not previously given: **2 gm Tranexamic Acid** in  
**100 ml NS/LR IV/IO; SLOW** over 10 min

NOT Improved?

REQUEST A **SECOND BLOOD COOLER** & ADMINISTER  
ADDITIONAL BLOOD PRODUCTS

REQUEST A **SECOND BLOOD COOLER** & ADMINISTER  
ADDITIONAL BLOOD PRODUCTS

Improved?

**3 gm Calcium GLUCONATE IV/IO**  
SLOW over 15 min

**3 gm Calcium GLUCONATE IV/IO**  
SLOW over 15 min

Continuously  
monitor patient  
through all phases  
of transport

Monitor for Transfusion Reaction

**STOP INFUSION!**  
follow **COG 8.3**  
**Anaphylaxis**

Notify receiving facility or contact Medical Control and alert "Code Transfusion"

(CONTINUED ON NEXT PAGE)

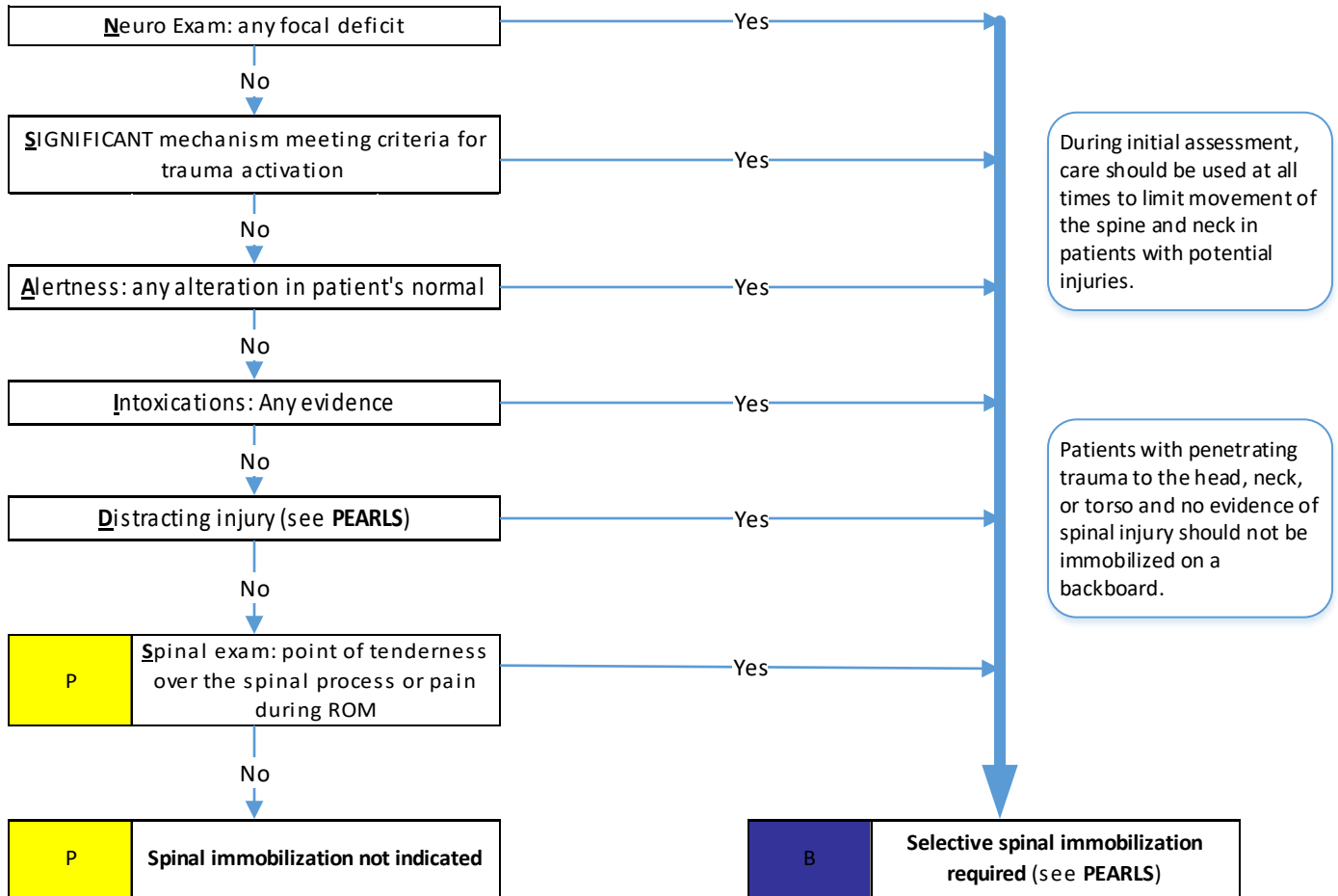
## PEARLS:

**\*\*FOR ANY FEMALE PATIENT < 50 Y/O RECEIVING O+ WHOLE BLOOD, PROVIDERS MUST CONTACT OLMC FOR ORDERS AND DOCUMENT WHO THEY NOTIFIED ON THEIR ePCR\*\***

- Prime blood tubing and warmer. Tubing should be changed after 2 Units if possible, or as manufacturer recommends. Care should be taken to prevent hypothermia.
- Monitor patients for signs and symptoms of transfusion reaction and adverse effects, including temperature at time of infusion and 15 minutes after start.
- Consider any fluid overload issues such as CHF or patient weight (pediatrics), and monitor for signs and symptoms appropriately.
- **Allergic reaction (onset <15 min)** - Mild skin itching or hives < 25% body, Temp 38C (100.4F) or change of
- 1C (>2F) from pre-transfusion value, chills, and hives/rash >25% body
- **Febrile transfusion reactions:** - Temp 38C (100.4F) or change of >1C (<1.8F) from pre-transfusion value, chills, headache, facial flushing, palpitations, cough, chest tightness, increased pulse rate and/or flank pain
- **Hemolytic transfusion reaction:** - Immediate lysis of transfused blood can result in fever and/or tachycardia. Other symptoms can include chills, back/flank pain, nausea/vomiting, dyspnea, flushing, bleeding, and/or hypotension. Begin aggressive NS 0.9%/LR treatment
- **Dilutional thrombocytopenia** - This is generally not seen with infusion of 1 – 2 units, unless patient has pre-existing thrombocytopenia or disseminated intravascular coagulation.
- **Potassium intoxication (hyperkalemia)** - Symptoms can include flaccidity, muscle twitching, bradycardia, EKG changes (tall peaked T waves, prolonged P-R interval, absent P waves, prolonged QRS) and/or cardiac arrest.
- **Hypocalcemia: (from citrate toxicity that binds Ca)** - Symptoms can include arrhythmias, hypotension, muscle cramping, nausea, vomiting, seizure activity, and/or tingling sensation in the fingers. Patient with acute or chronic hepatic insufficiency are at relatively higher risk of citrate toxicity. Treatment with Calcium Gluconate 3 gm infused slowly in a different IV/IO line if possible.

**FOR ANY REACTION, STOP THE INFUSION, REMOVE ALL TUBING AND PRODUCT FROM THE PATIENT AND SAVE ALL EQUIPMENT. FLUSH IV LINE.**

Contact Medical Control for additional boluses as necessary



## PEARLS:

- Full spinal immobilization to include the use of a long spine board should be used judiciously and according to current evidence based practices. Limiting spinal movement may be best achieved in **alert** patients by application of a rigid cervical collar, securing the patient firmly to a stretcher, and using verbal coaching to limit neck/back movement.
- Ambulatory patients that require spinal immobilization can have an appropriately sized cervical collar placed and pivot/sit to the stretcher for securing.
- Non-ambulatory and alert patients can be lifted using a scoop stretcher and a C-collar in lieu of a backboard. The scoop can be removed during transport if causing pain or distress.
- In situations where the patient is still in a vehicle, consider allowing alert and oriented patients to wear a C-collar and extricate themselves to the stretcher.
- Non-alert patients require full traditional immobilization utilizing either a backboard or scoop.**
- 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**eurologic exam: Look for paralysis, focal deficits such as tingling, reduced strength, numbness in an extremity, loss of urethral or sphincter control (incontinence), or priapism.
  - S**ignificant mechanism of injury includes high energy events such as ejection, high falls, and abrupt deceleration crashes, blunt trauma to the neck, or extremes of age.
  - A**lertness: Is patient oriented to person, place, time, and situation? Any change to alertness with this incident? Normal GCS?
  - I**ntoxication: Is there any indication that the person is intoxicated (impaired decision making ability)?
  - D**istracting injury: A condition thought by the clinician to be producing pain sufficient to distract the patient from a secondary (neck) injury.
  - S**pinal exam: Look for point tenderness in any spinal process or spinal process tenderness with range of motion.
- If experiencing difficulty fitting the C-collar to the patient consider other options such as a towel roll.

## History:

- Past medical history
- Medications
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
- DNR form

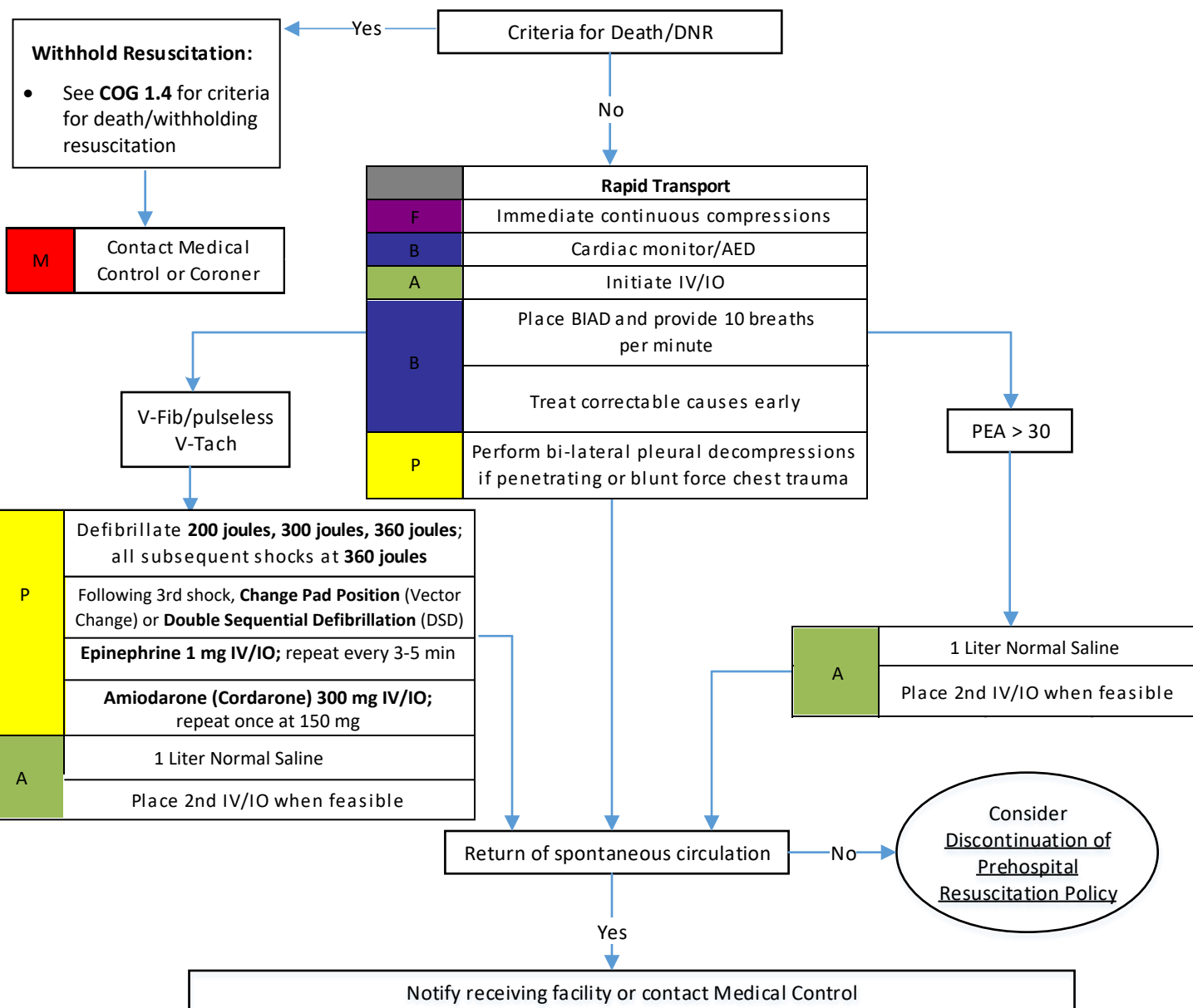
## Significant Findings:

- Unresponsive
- Pulseless
- Apneic
- No electrical activity on EKG
- V-fib/V-tach
- No auscultated heart tones

## Withhold resuscitation:

- No pulse and asystole
- PEA < 30 BPM
- Injuries incompatible with life

Consider terminating resuscitation if at any time patient presents with asystole or wide complex PEA < 30 BPM.



## PEARLS:

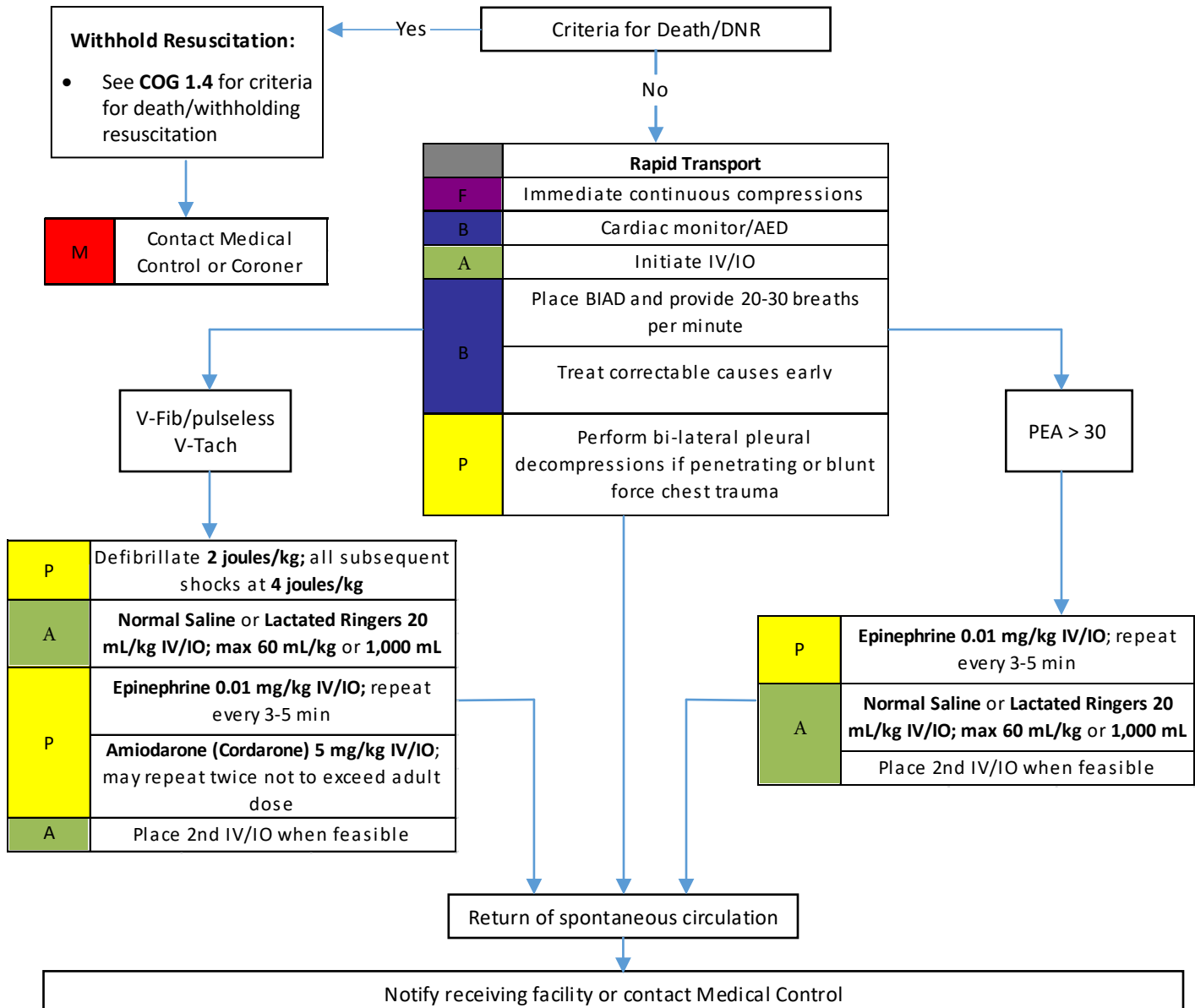
- If cardiac arrest is believed to be caused by a medical etiology, follow medical cardiac arrest COG.
- Request blood products early.
- If the patient goes into or is in cardiac arrest and blood has not been initiated, do NOT initiate unless ROSC is achieved.
- If the patient goes into cardiac arrest and blood has already been initiated, continue infusion.
- If the patient was in cardiac arrest and you attain ROSC, administration of blood product is indicated.
- **Hangings are not considered trauma. See appropriate medical protocol.**
- Always confirm asystole in more than one lead.
- Assign a team resuscitation leader and utilize checklist.
- Place monitor in paddles mode with metronome on.
- Reassess and document advanced airway placement and EtCO<sub>2</sub> frequently, after every move, and at transfer of care.

## History:

- Past medical history
- Medications
- End stage renal disease
- Estimated downtime
- Suspected hypothermia
- Suspected overdose
- DNR form

## Significant Findings:

- Unresponsive
- Pulseless
- Apneic
- No electrical activity on EKG
- V-fib/V-tach
- No auscultated heart tones



## PEARLS:

- If cardiac arrest is believed to be caused by a medical etiology, follow medical cardiac arrest COG.
- Request blood products early.
- If the patient goes into or is in cardiac arrest and blood has not been initiated, do NOT initiate unless ROSC is achieved.
- If the patient goes into cardiac arrest and blood has already been initiated, continue infusion.
- If the patient was in cardiac arrest and you attain ROSC, contact OLMC for blood product if indicated.
- Fluid should be given in increments of 20 mL/kg, reassess after each bolus.
- Hangings are not considered trauma. See appropriate medical protocol.
- Always confirm asystole in more than one lead.
- Assign a team resuscitation leader and utilize checklist.
- Place monitor in paddles mode with metronome on.
- Reassess and document advanced airway placement and EtCO<sub>2</sub> frequently, after every move, and at transfer of care.

## History:

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

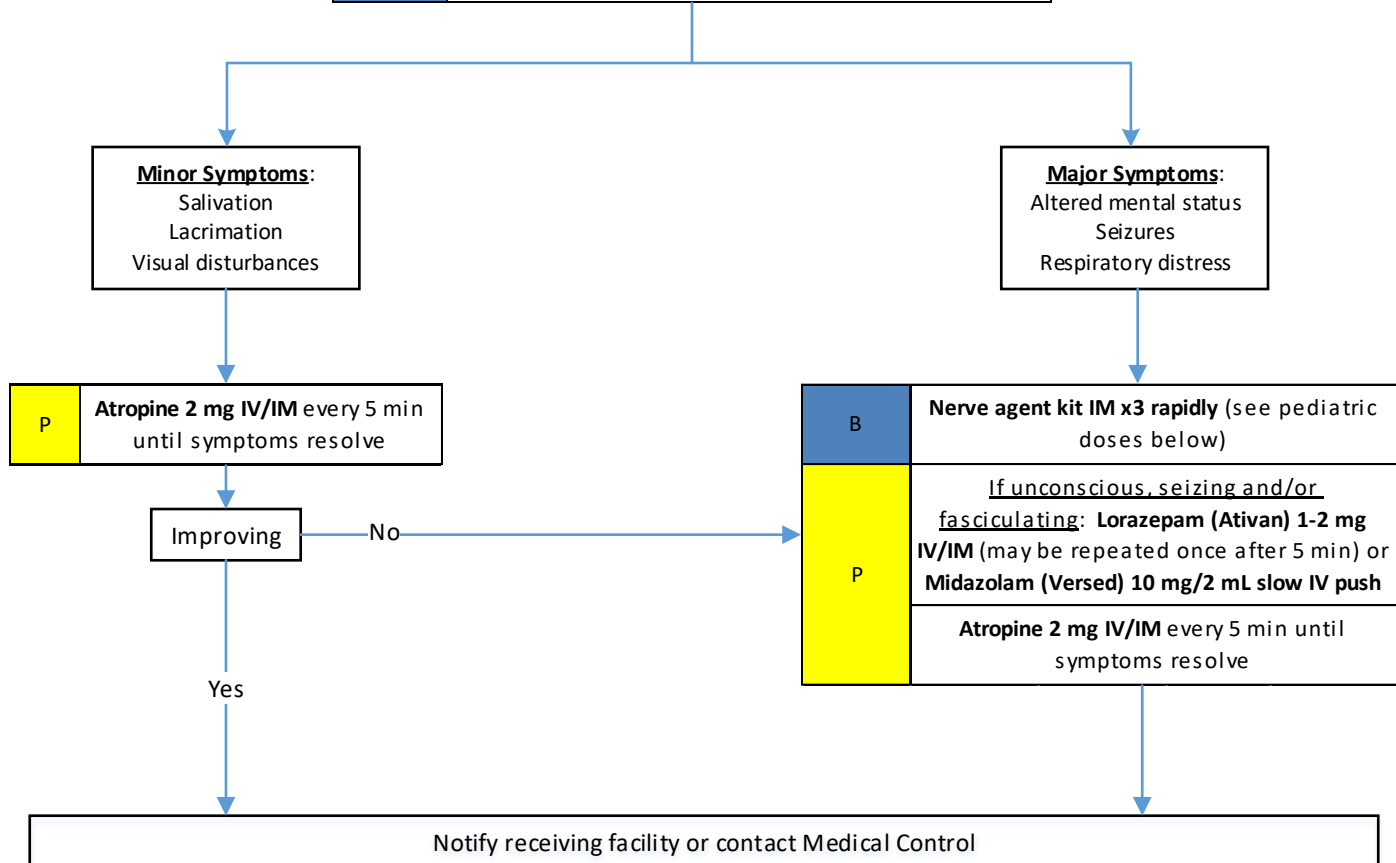
## Significant Findings:

- Visual disturbances
- Headache
- Nausea/vomiting
- Salivation
- Lacrimation
- Respiratory distress
- Diaphoresis
- Seizure activity
- Respiratory arrest
- Fasciculation

## Differential:

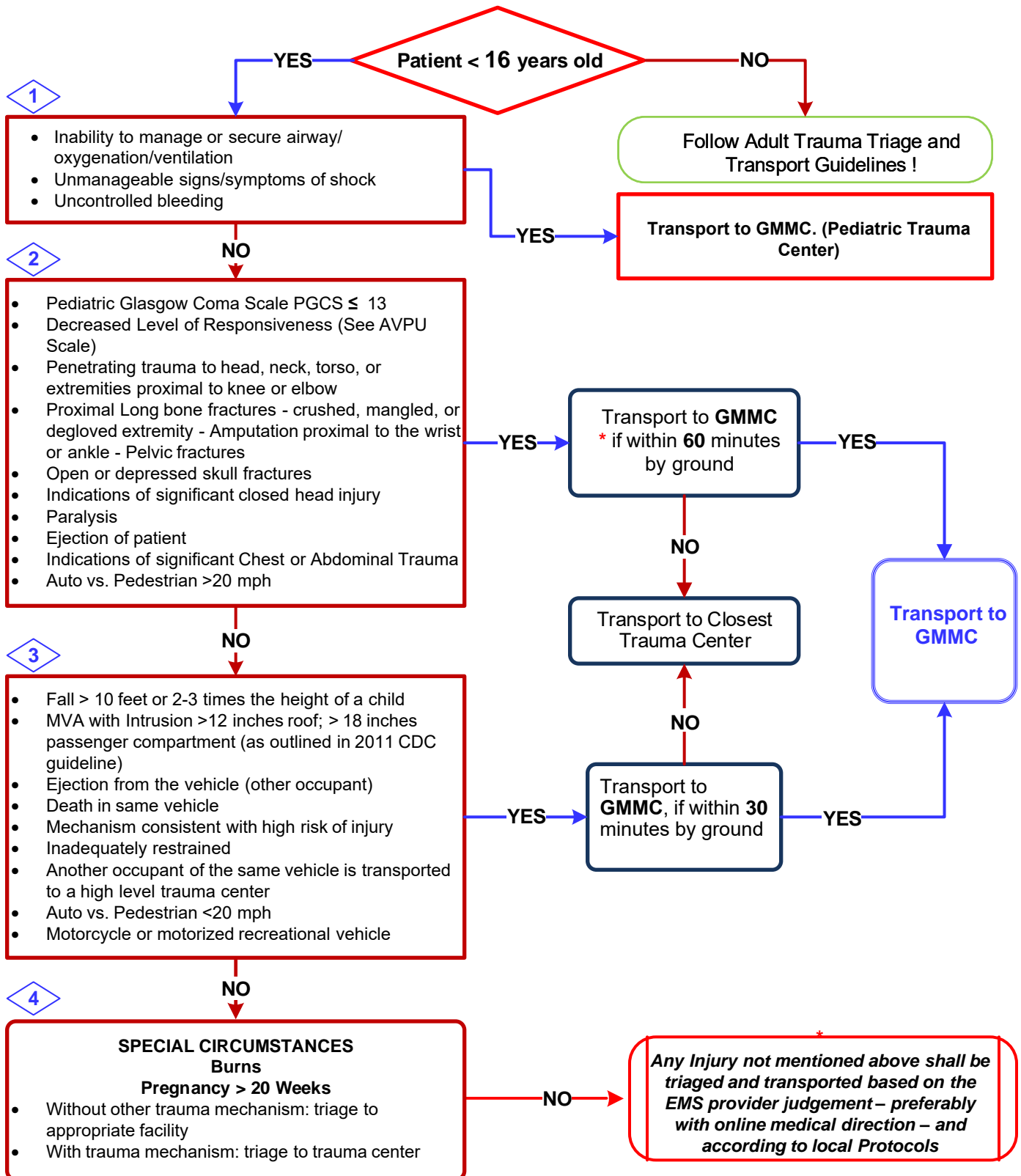
- Nerve agent exposure (e.g., VX, sarin, soman, etc.)
- Organophosphate exposure (pesticide)
- Vesicant exposure (e.g., mustard gas, etc.)
- Respiratory irritant exposure (e.g., hydrogen sulfide, ammonia, chlorine, etc.)

	<b>Oxygen</b>
F	Initiate triage and/or decontamination as indicated; avoid inhalation and skin contact
A	Initiate IV
B	12-Lead EKG
	Obtain BGL



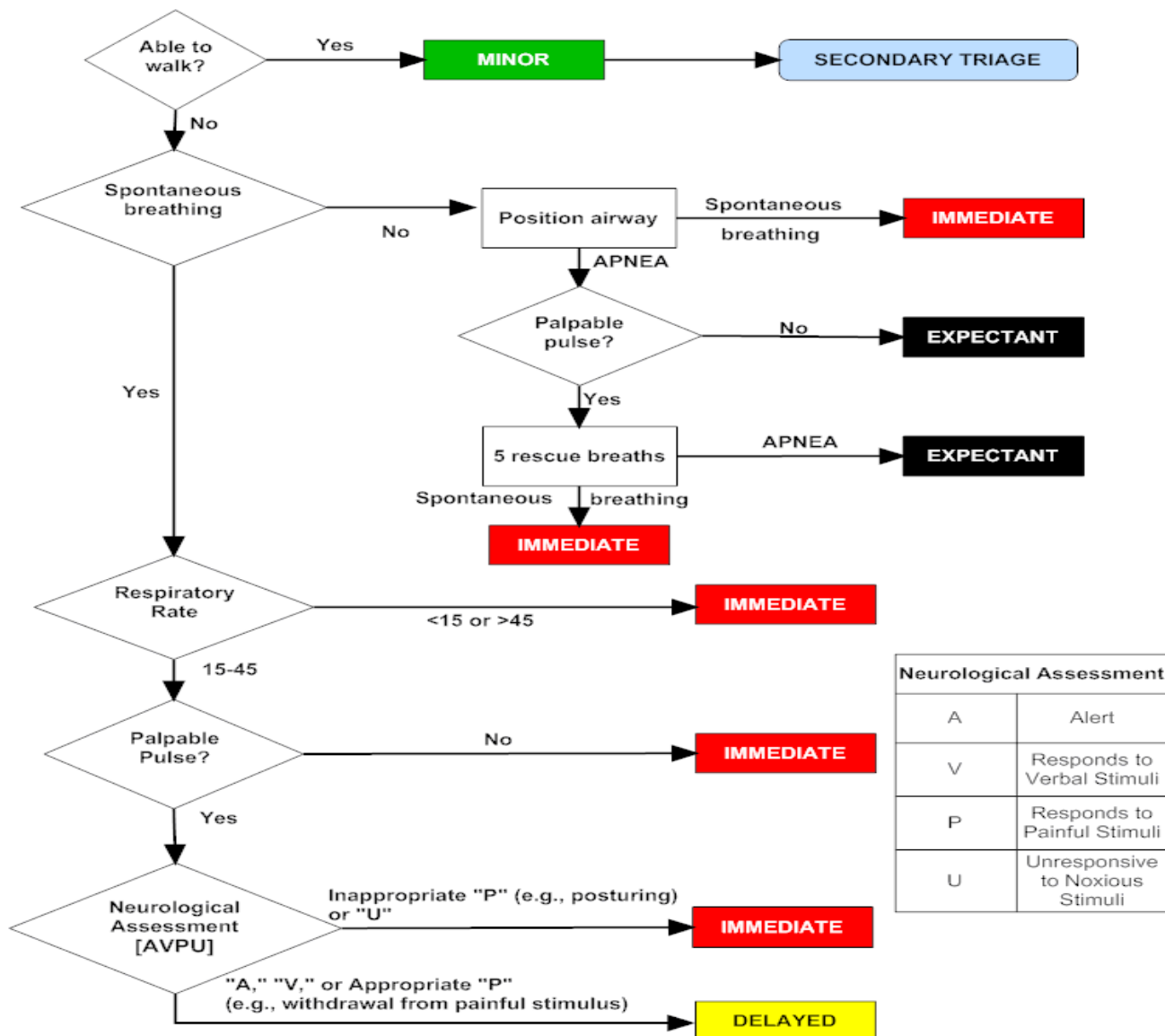
## PEARLS:

- In the face of a bona fide attack, begin with **1 nerve agent kit for patients less than 7 years of age, 2 nerve agent kits from 8 to 14 years of age, and 3 nerve agent kits for patients 15 years of age and over.**
  - If triage/MCI issues exhaust supply of nerve agent kits, use pediatric atropens (if available). Use the **0.5 mg dose if patient is less than 40 pounds (18 kg), 1 mg dose if patient weighs between 40 to 90 pounds (18 to 40 kg), and 2 mg dose for patients greater than 90 pounds (greater than 40 kg).**
  - Follow local HAZMAT protocols for decontamination and use of personal protective equipment.**
  - Carefully evaluate patients to ensure they are not reacting from exposure to another agent (e.g. narcotics, vesicants, etc.).
- The main symptom that the **Atropine** addresses is excessive secretions so **Atropine** should be given until salivation improves





## JumpSTART Pediatric Multiple Casualty Incident Triage



Use JumpSTART if the Patient appears to be a child.

Use an adult system, such as START, if the patient appears to be a young adult.

### Triage Categories

#### EXPECTANT

Black Triage Tag Color

- Victim unlikely to survive given severity of injuries, level of available care, or both
- Palliative care and pain relief should be provided

#### IMMEDIATE

Red Triage Tag Color

- Victim can be helped by immediate intervention and transport
- Requires medical attention within minutes for survival (up to 60)
- Includes compromises to patient's Airway, Breathing, Circulation

#### DELAYED

Yellow Triage Tag Color

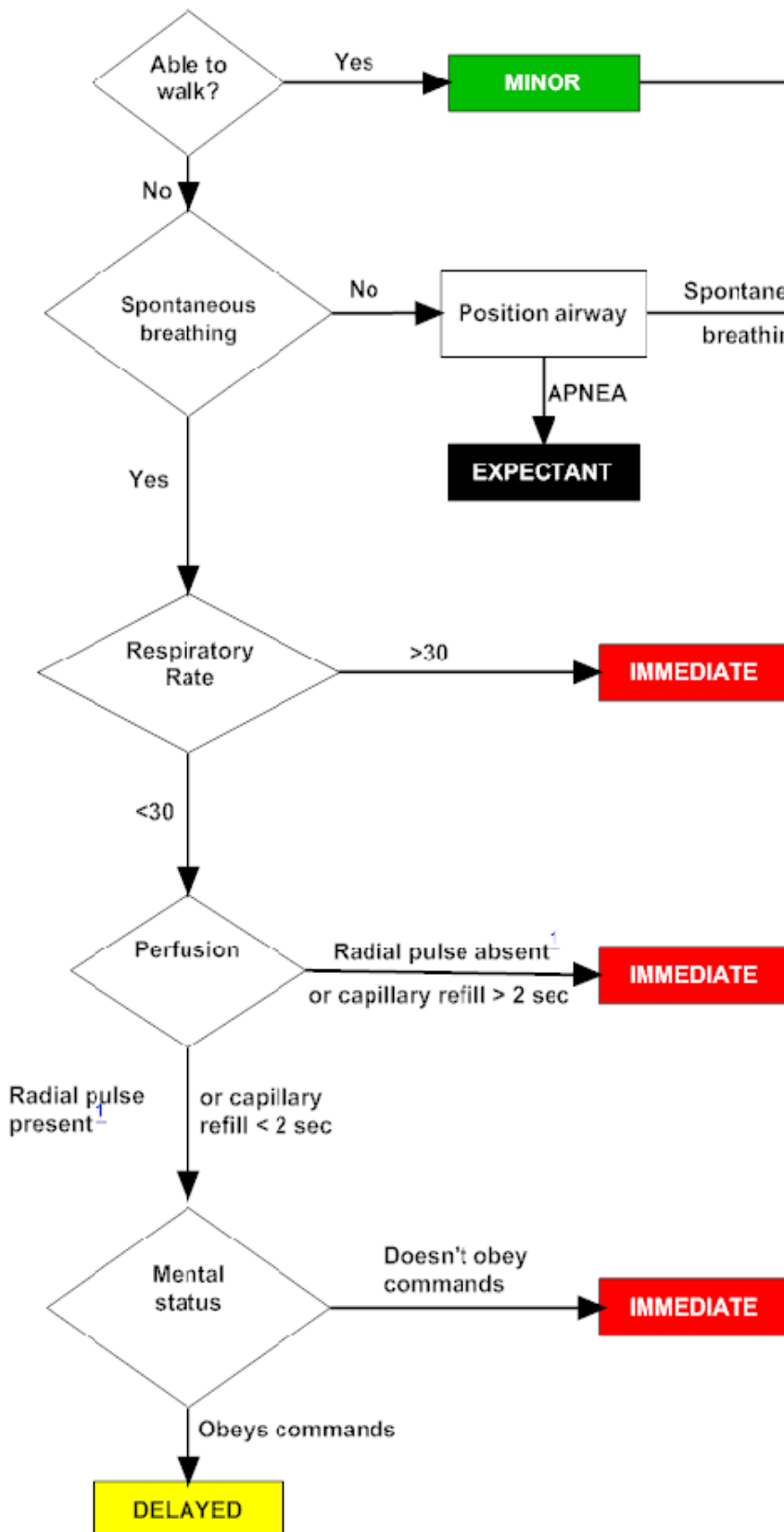
- Victim's transport can be delayed
- Includes serious and potentially life-threatening injuries, but status not expected to deteriorate significantly over several hours

#### MINOR

Green Triage Tag Color

- Victim with relatively minor injuries
- Status unlikely to deteriorate over days
- May be able to assist in own care: "Walking Wounded"

## START Adult Triage



### Triage Categories

#### EXPECTANT Black Triage Tag Color

- Victim unlikely to survive given severity of injuries, level of available care, or both
- Palliative care and pain relief should be provided

#### IMMEDIATE Red Triage Tag Color

- Victim can be helped by immediate intervention and transport
- Requires medical attention within minutes for survival (up to 60)
- Includes compromises to patient's Airway, Breathing, Circulation

#### DELAYED Yellow Triage Tag Color

- Victim's transport can be delayed
- Includes serious and potentially life-threatening injuries, but status not expected to deteriorate significantly over several hours

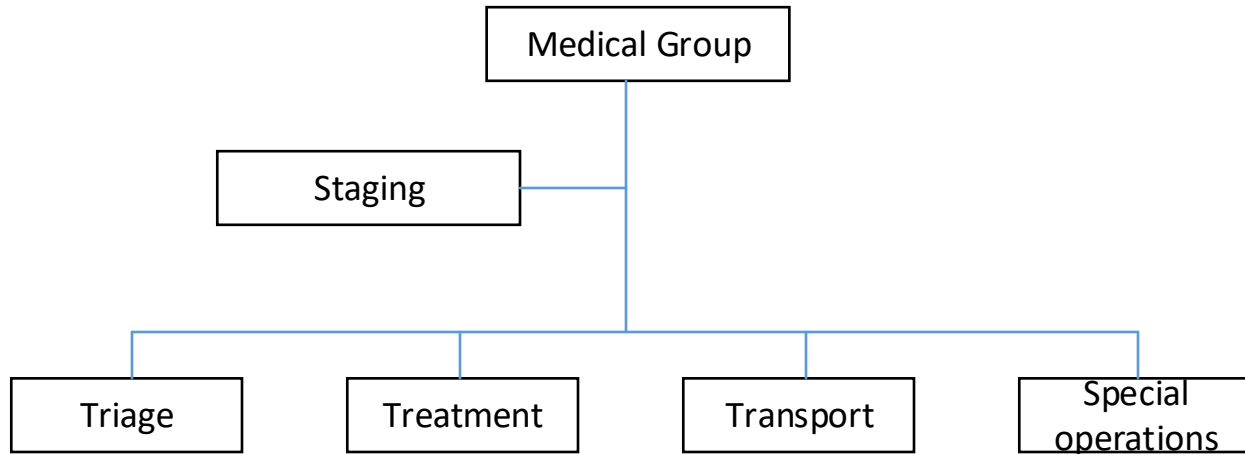
#### MINOR Green Triage Tag Color

- Victim with relatively minor injuries
- Status unlikely to deteriorate over days
- May be able to assist in own care: "Walking Wounded"

## Definitions:

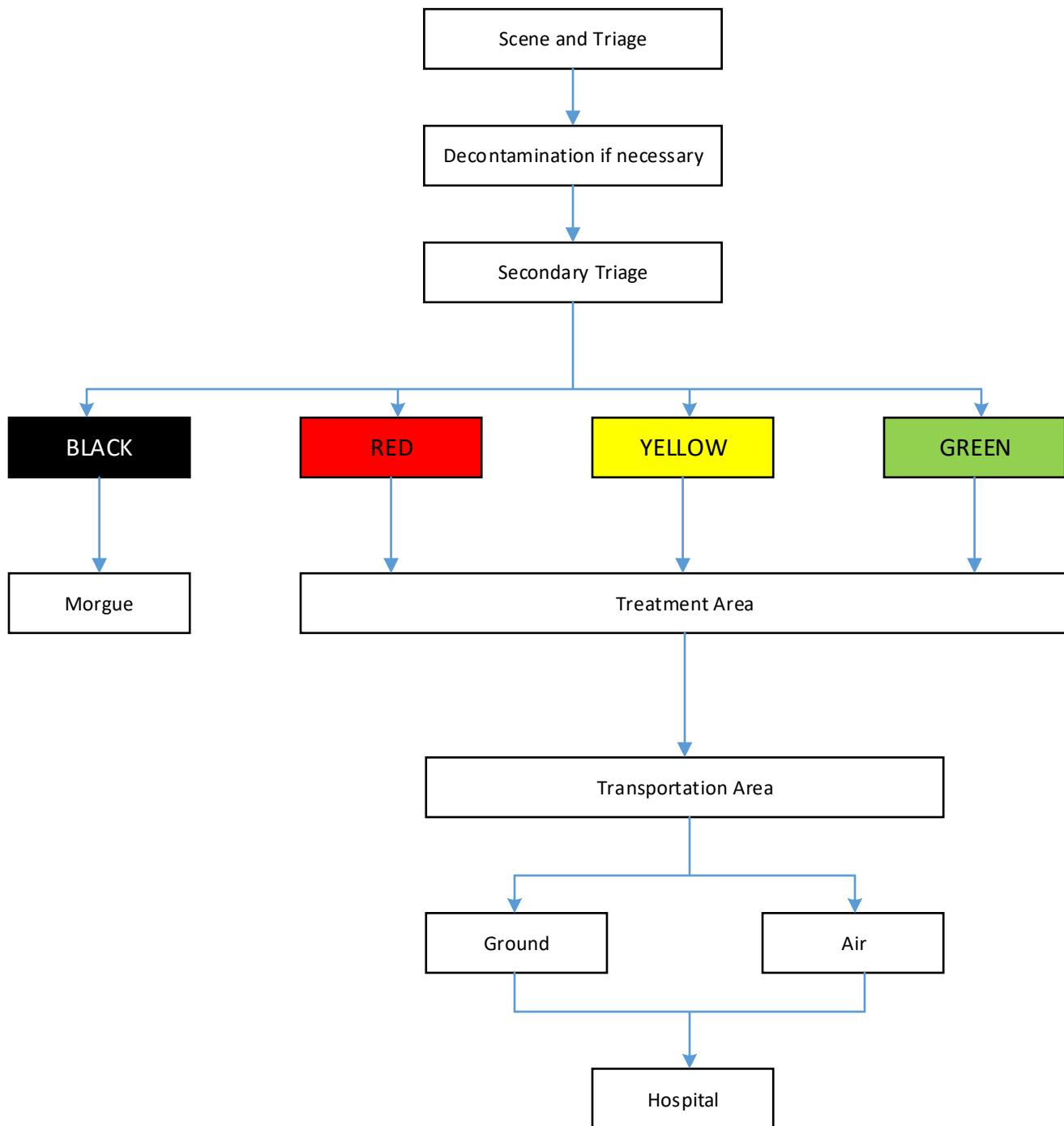
- **Major Event** is defined as any incident with fewer than 25 patients
- **Mass Care incident** is defined as any incident with 25 to 100 patients
- **Disaster is defined** as any incident with 100 patients of greater

- **Fast Attack Command:** A small scale incident which can be managed by a Medical Group Supervisor. One person may assume more than one function (i.e., Triage, treatment, etc.).
- **Fixed Command:** Larger events (based on size, complexity, or potential for rapid expansion), that require an early stationary command. In these cases, the first arriving Medical Incident Commander will assume medical command and, from the very beginning, stay out of the hazard zone in a stationary unified command position.

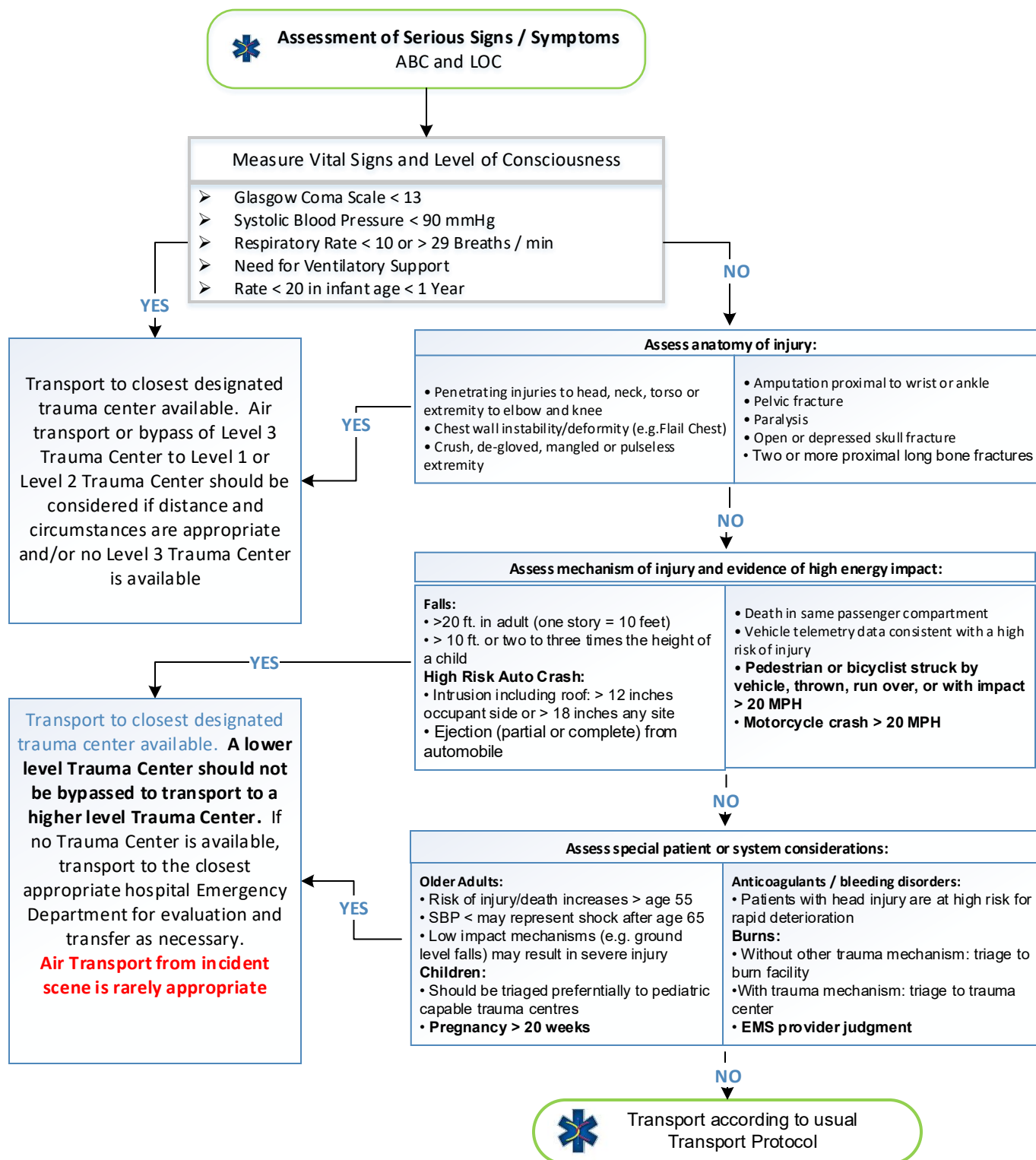


## STEPS FOR INCIDENT MANAGEMENT:

- **SAFETY Assessment**
  - Identify all hazards; electrical, flammable, CBRNE: chemical, biological, radiological, nuclear, and high-yield explosives.
  - Be aware of the potential for secondary explosive devices.
  - Are patients contaminated and require decontamination?
- **SIZE Up**
  - Survey incident scene. **(Get the big picture).**
  - Type and/or cause of incident.
  - Approximate number of patients and severity levels.
  - Identify problems accessing scene for incoming resources.
- **SEND information: Provide situation report to communications**
  - Identify EMS Medical Commander (last name)
  - Provide situation report
  - Request a balance of resources.
  - Provide staging instructions
  - **Communications shall alert Prisma Health and St. Francis that a mass-care-incident has occurred.**
  - Implement departmental personnel accountability system
- **SETUP the scene for management of the casualties**
  - Establish staging area **Level 1** for on scene staging or **Level 2** staging for “off site” staging of resources and/or personnel.
  - Identify access and egress routes.
  - Identify adequate work areas for Triage, Treatment, Transportation, and LZ.
- **START (Simple Triage and Rapid Treatment) and JumpSTART (for pediatric patients)**
  - Begin where you are.
  - Ask anyone who can walk to move to a designated area.
  - Move quickly from patient to patient.
  - Initially patient’s priority level will be indicated by placing the appropriate color triage tape on victim’s extremity. Maintain patient count by triage color.
  - Provide minimal treatment.
  - Keep moving (**situational awareness**).

**PEARLS:**

- Never go after the obvious at the expense of the basics.
- Do the greatest good for the greatest number.
- Make the best use of personnel, equipment, and resources.
- Do not relocate the disaster (Right Patient-Right Facility).
- During large scale incidents, alternate care facilities such as Urgent Care, Ambulatory Care, and other out-patient care facilities may be utilized to manage low acuity patients.



## Pearls

- 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.
- Mechanism is the most reliable indicator of serious injury.
- In prolonged extrications or serious trauma, consider air transportation for transport times and the ability to give blood.
- Scene times should not be delayed for procedures. These should be performed en route when possible. Rapid transport of the unstable trauma patient is the goal.

# Approved Abbreviations

12.1

Please refrain from using codes, and non-standard abbreviations (not commonly accepted by the medical community)

Abbreviation	Meaning
Abd	Abdomen
ABG	Arterial Blood Gas
AVC	Antecubital
ACS	Acute Coronary Syndromes
A Fib	Atrial Fibrillation
AICD	Automated Internal Cardiac Defibrillator
AM	Morning
AMI	Acute Myocardial Infarction
AMS	Altered Mental Status
Ant.	Anterior
Approx	Approximate
ASAP	As soon as possible
Ausc	Auscultation
Admin	Administer
B	Black
BBB	Bundle Branch Block
BIAD	Blind Insertion Airway Device
BID	Twice a day
BGL	Blood Glucose Level
BM	Bowel movement
BP	Blood Pressure
C	With
CA	Cancer
CAT	Computerized Axial Tomography
Cath	Catheter
Cc	Cubic Centimeter
CCU	Coronary Care Unit
C/c	Chief Complaint
C-collar	Cervical collar

Abbreviation	Meaning
CHF	Congestive Heart Failure
Cm	Centimeter
CNS	Central Nervous System
CO2	Carbon dioxide
c/o	Complaining of
COPD	Chronic Obstructive Pulmonary Disease
CP	Chest Pain
CPAP	Continuous Positive Airway Pressure
C-spine	Cervical Spine
CPR	Cardio-pulmonary Resuscitation
C-section	Cesarean Section
CSF	Cerebrospinal Fluid
CTA	Clear to auscultation
CVA	Cerebrovascular Accident
DBP	Diastolic Blood Pressure
D/C	Discontinue
DKA	Diabetic ketoacidosis
DNR	Do not resuscitate
DO	Doctor of Osteopathy
DOA	Dead on arrival
DOB	Date of birth
DPI	Distracting Painful Injury
Dx	Diagnosis
ENT	Ears, Nose and Throat
EKG	Electrocardiogram
EMS	Emergency Medical Services
ER	Emergency Room
ETA	Estimated time of arrival

Abbreviation	Meaning
ETT	Endotracheal tube
ETOH	Ethyl Alcohol
Exam	Examination
F	Female
FD	Fire Department
Fx	Fracture
ga	Gauge
Gal	Gallon
GCS	Glasgow Coma Scale
GI	Gastrointestinal
Gm/Gr	Gram
GrMH	Greer Memorial Hospital
GMMC	Greenville Memorial Medical Center
GSW	Gunshot wound
Gtt	Drops
Gyn	Gynecology
H	Hispanic
Ha	Headache
Hgb	Hemoglobin
HH	Hillcrest Hospital
HPI	History of Present Illness
HR	Heart Rate
Hx	History
ICE	Induced Cooling by EMS or Induced Hypothermia Therapy
ICP	Intracranial Pressure
ICU	Intensive Care Unit
IM	Intramuscular
Info	Information
INT	Intermittent Needle Therapy
IUD	Intra Uterine Device
IV	Intravenous
JVD	Jugular Vein Distention
K	Potassium
KED	Kendrick Extrication Device
Kg	Kilogram
KVO	Keep vein open
L	Left
Lat	Lateral
Lb	Pound
LLQ	Left lower quadrant
LMA	Laryngeal Mask Airway
LMP	Last menstrual period
LOC	Loss of consciousness
LP12	Life Pak 12 Monitor
LP15	Life Pak 15 Monitor
LR	Lactated Ringer's Solution

Abbreviation	Meaning
L/S	Lung sounds
LSB	Long spine board
LUQ	Left upper quadrant
M	Male
MA	Milliamps
MAP	Mean Arterial Pressure
Max	Maximum
MCA	Motorcycle accident
Mcg	Microgram
MCI	Mass Casualty Incident
MD	Medical Doctor
mEq	Milliequivalent
Mg	Magnesium
mg	Milligram
MI	Myocardial Infarction
MIP	Marshall I Pickens Hospital
mL	Milliliter
Mm	Millimeter
MOI	Mechanism of Injury
MVA	Motor vehicle accident
Na	Sodium
N/A	Not applicable
NaCl	Sodium Chloride
NC	Nasal Cannula
Neuro	Neurological
N/K	Not known
NKDA	No known drug allergy
NKA	No known allergy
NIHSS	National Institute of Health Stoke Scale
NGH	North Greenville Hospital
NPA	Nasopharyngeal Airway
NS	Normal Saline
NSR	Normal Sinus Rhythm
NT	Nasotracheal
NTG	Nitroglycerin
N/V	Nausea / Vomiting
O2	Oxygen
OB	Obstetrics
OB-GYN	Obstetrics and Gynecology
OJ	Out of jurisdiction
OPA	Oropharyngeal Airway
OR	Operating Room
Ortho	Orthopedics
Oz	Ounce
P	Pulse
P.A.	Physician's Assistant
PAC	Premature Atrial Complex

Abbreviation	Meaning
palp	Palpation
PAP Smear	Papanicolaou Smear
PAT	Paroxysmal Atrial Tachycardia
PCI	Percutaneous Coronary Intervention or “cath lab”
PE	Pulmonary Embolism
PEEP	Positive End Expiratory Pressure
PERL	Pupils equal and reactive to light
Ph	Hydrogen Ion Concentration
PID	Pelvic Inflammatory Disease
PJC	Premature Junctional Complex
PM	Evening or afternoon
PMCST	Posterior Midline Cervical Spine Tenderness
PMH	Past Medical History
p.o.	By mouth
Post	Posterior
prn	As necessary
Pt.	Patient
Q	Every
QD	Every day
QH	Every hour
QID	Four times a day
R	Right
RBC	Red Blood Cell
Reg	Regular
RLQ	Right Lower Quadrant
RN	Registered Nurse
ROM	Range of Motion
ROSC	Return of Spontaneous Pulse
RTS	Rapid Trauma Score
Rx	Prescription
S	Without
SAA	Same as above
SANE	Sexual Assault Nurse Examiners
SBP	Systolic Blood Pressure
SL	Sublingual
SOB	Shortness of breath
SQ	Subcutaneous
SR	Sinus Rhythm
S/S	Signs and Symptoms
ST	Sinus Tachycardia
Stat	At once
STD	Sexually Transmitted Disease
STEMI	ST Elevation MI
Sx	Symptoms
Tach	Tachycardia

Abbreviation	Meaning
Tbsp	Tablespoon
Temp	Temperature
TIA	Transient Ischemic Attack
TID	Three times a day
Tsp	Teaspoon
VA	Veteran’s Administration
VD	Venereal Disease
V fib	Ventricular Fibrillation
V/S	Vital signs
V tach	Ventricular Tachycardia
W	White
w/	with
WBC	White Blood Cell
w/o	without
WPW	Wolff–Parkinson–White syndrome
>	Greater than
<	Less than
=	Equal
+	Positive
-	Negative
-	Increase or superior to
-	Decrease or inferior to
♂	Male
♀	Female



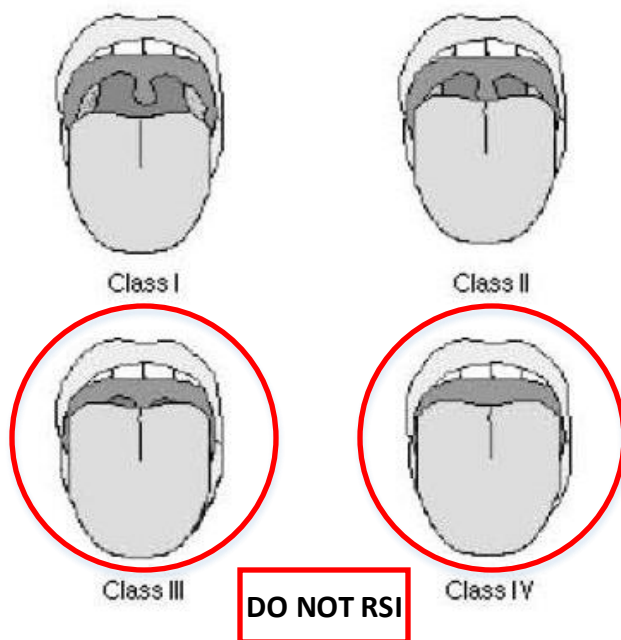
## Evaluating for the difficult airway (LEMON)

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 the bougie and BIAD) 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.

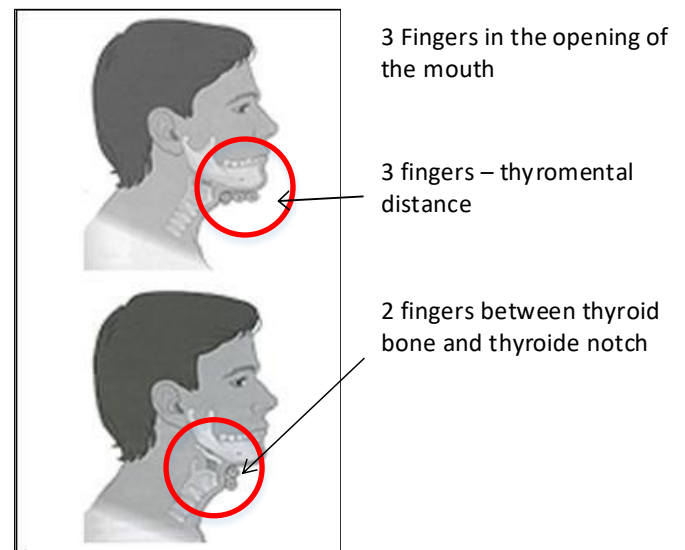
**Look Externally:** External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, edentulous mouth, facial trauma, obesity, large front teeth or "buck teeth", high arching palate, receding mandible, short bull neck.

**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 –**

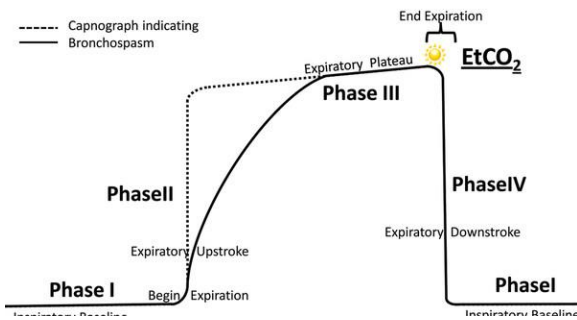


**3-3-2 Rule**

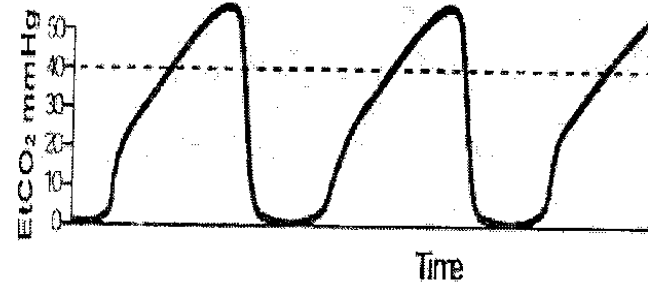


**Obstruction:** Besides the obvious difficulty if the airway is obstructed with a foreign body, the Paramedic should also consider other obstructors such as tumor, abscess, epiglottitis, or expanding hematoma.

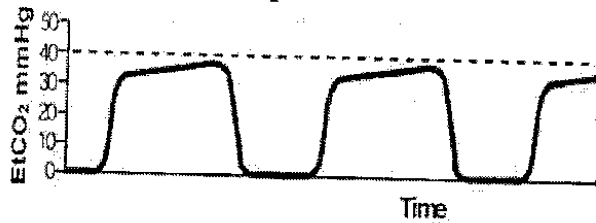
**Neck Mobility:** Ask the patient to place their chin on their chest and to tilt their head backward as far as possible. Obviously, this will not be possible in the immobilized trauma patient.



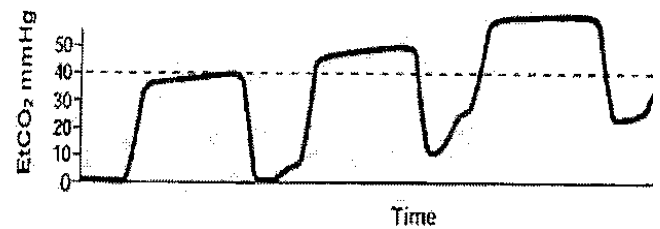
Bronchospasm  
(COPD, Asthma, etc.).



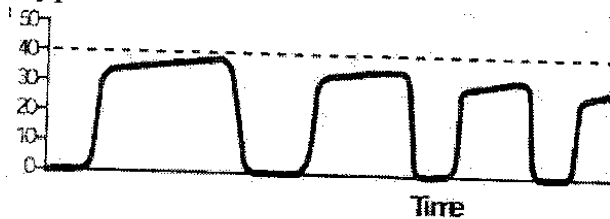
Normal Capnograph



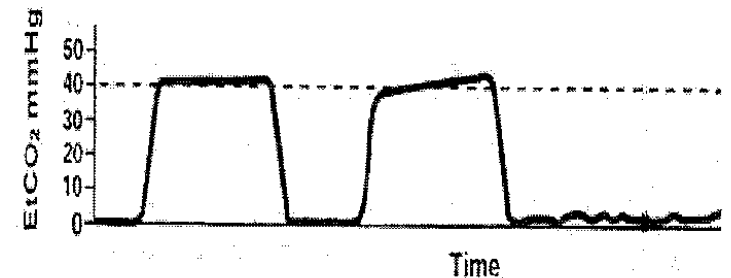
Elevated Baseline  
(Incomplete Inhalation/Exhalation)



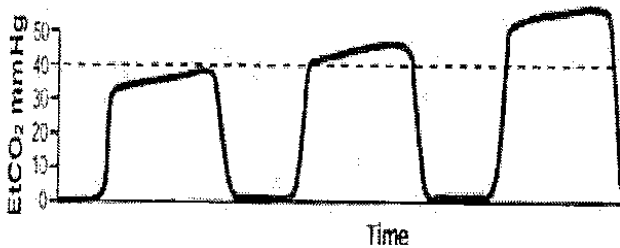
Hyperventilation



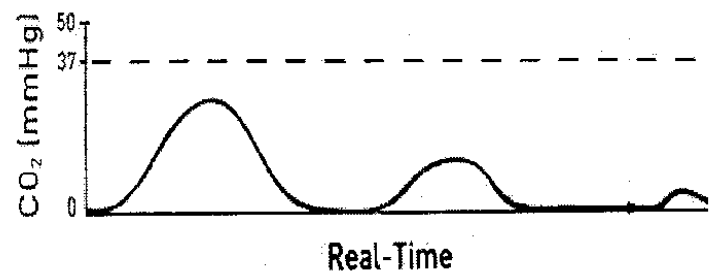
Apnea/Loss of Waveform  
(Tube dislodged, Resp Arrest, Equip. Problem)



Hypoventilation



Esophageal Intubation



Note: Reference values may vary, depending on the lab or methods used.

## HEMATOLOGY

	<u>Male:</u>	<u>Female:</u>	<u>Child:</u>
RBC	4.2-5.6 M/uL	3.8-5.1 M/uL	3.5-5 M/uL
WBC	3.8-11.0 K/mm <sup>3</sup>	3.8-11.0 K/mm <sup>3</sup>	5-10K/mm <sup>3</sup>
Hgb	14-18 g/dL	11-16 g/dL	10-14 g/dL
Hct	39-54%	34-47%	30-42%
MCV	78-98 fL	78-98 fL	
MCH	27-35 pg	27-35 pg	
MCHC	31-37%	31-37%	
Neutrophils	50-81%	50-81%	
Bands	1-5%	1-5%	
Lymphocytes	14-44%	14-44%	
Monocytes	2-6%	2-6%	
Eosinophils	1-5%	1-5%	
Basophils	0-1%	0-1%	

Note: The below values are guidelines. Individual markers may vary depending on the size of the infarct, onset of symptoms, the lab or methods used, etc.

## CARDIAC MARKERS

<u>NORMAL</u>	<u>TROPONIN I ng/mL</u>	<u>MYOGLOBIN ng/mL</u>	<u>CK-MB ng/mL</u>
Male	0-0.1	10-65	0-4
Female	0-0.1	10-95	0-4 >10% of total

<u>ACUTE MI</u>			
Onset (hrs)	4-6h	1-3h	3-4h
Peak (hrs)	12-24h	6-10h	12-24h
Duration (days)	4-7d	12-24h	2-3d

## LIPID PANEL (ADULT)

Cholesterol (total)	<200 mg/dL desirable	
Cholesterol (HDL)	30-75 mg/dL	
Cholesterol (LDL)	<130 mg/dL desirable	
Triglycerides	Male: >40-170 mg/dL	Female: >35-135 mg/dL

## Glasgow Coma Scale

**Eye Opening**

Spontaneous	4
To loud voice	3
To pain	2
None	1

**Verbal response**

Oriented	5
Confused, disoriented	4
Inappropriate words	3
Incomprehensible sounds	2
None	1

**Best motor response**

Obeys commands	6
Localizes pain	5
Withdraws to pain	4
Abnormal flexion posturing	3
Extension posturing	2
None	1

## Revised Trauma Score

<b><i>Glasgow Coma Scale</i></b>	<b><i>Systolic Blood Pressure</i></b>	<b><i>Respiratory Rate</i></b>	<b><i>Coded Value</i></b>
13-15	>89	10-29	<b>4</b>
9-12	76-89	>29	<b>3</b>
6-8	50-75	6-9	<b>2</b>
4-5	1-49	1-5	<b>1</b>
3	0	0	<b>0</b>

# Hospital Numbers

12.6

Hospital	Radio Code	Recorder Line (p= pause; treas as ext,)	Map Code
Greenville Memorial	Code 36	(864) 467-4700 p0717p671p455-7725	49J
Greer Memorial	Code 38	(864) 467-4700 p0717p671p455-7725	37A
Pelham Medical Center	N/A	(864) 467-4700 p0717p680p530-2024	45H
St. Francis Downtown	Code 40	(864) 467-4700 p0717p678p255-1107	43R
St. Francis Eastside	Code 41	(864) 467-4700 p0717p675p675-4848	41X
St. Francis Simpsonville	N/A	(864) 467-4700 p0717p675p757-3814	N/A
Hillcrest	Code 37	(864) 467-4700 p0717p671p455-7725	75T
Palmetto Baptist	N/A	(864) 467-4700 p0717p671p455-7725	N/A
North Greenville	Code 39	(864) 467-4700 p0717p671p455-7725	18B
Patewood	N/A	(864) 467-4700 p0717p671p455-7725	N/A

**FD Medical Control Consult Number: 864-467-8801**

# Adult Hospital Destination Guidelines

12.7A

## Adult Patient Type:

## Appropriate transport destinations

All Trauma Alert Levels

Greenville Memorial

Uncooperative/Violent adult patients

Greenville Memorial

SFH Downtown

STEMI Alerts

Greenville Memorial

SFH Downtown

Acute coronary syndrome patients

Any Prisma Health Facility

Any St. Francis Hospital Facility

PMC

Post cardiac arrest patients

Greenville Memorial

SFH Downtown

Sexual assault patients

Any Prisma Health Facility

Any St. Francis Hospital Facility

Dialysis patients w/ dialysis related complaint

Greenville Memorial

SFH Downtown

Sepsis Alerts

Any Prisma Health Facility

SFH Downtown

SF Eastside

Suspicion of leaking Aortic Aneurysm; Determined by age, presentation, & physical exam

Greenville Memorial

SFH Downtown

Stroke Alerts w/ R.A.C.E score  $\geq 4$  Comprehensive Stroke Center

Greenville Memorial

Stroke, TIA (R.A.C.E score < 4)

Any St. Francis Hospital Facility

Greenville Memorial

Greer

Hillcrest

PMC

OB patients greater than 14 weeks; w/ OB complaint

Greenville Memorial

SF Eastside

OB patients greater than or equal to 35 weeks; w/ OB complaint and without any exclusion criteria. (See PEARLS)

Patewood

Greer Memorial

### PEARLS:

- With a R.A.C.E score of  $\geq 4$  recommend transport to a comprehensive stroke center.
- Any acute coronary syndrome patient that presents a high suspicion for need of intervention should be transported to a PCI capable hospital.
- Once the destination hospital has been determined, the EMS crew must call the receiving facility via a recorded line as soon as possible. The report should include Age, Sex, Chief complaint, & Vital signs.
- A more complete report should be given for higher acuity patients.
- Any deviation of this Hospital Destination Guideline should be made by the diverting physician on a recorded line.
- Behavioral patients should be evaluated on a one-by-one basis by the EMS crew and will be transported to the nearest, most appropriate facility.
- Every attempt should be made to transport all OB patients to the hospital in which their OB physician is located.
- Most patients are explicitly told their delivery should only occur at GMH versus other Prisma facilities.
- **OB Patient Exclusion Criteria:** The most important exclusion criteria for Patewood and Greer Memorial is a gestational age of less than 35 weeks. Other exclusion criteria include the presence of end organ damage/disease severe preeclampsia, uncontrolled gestational hypertension, placental abruption, etc... placenta previa, history of certain cardiac conditions (coronary artery disease CHF, low ejection fraction) uncontrolled diabetes mellitus, anemia, thrombocytopenia, genital HSV within 30 days of delivery.
- The patient retains the right to refuse a diversion. In these cases notify the receiving hospital that the diversion was refused by patient, and have the patient sign a refusal declining the recommendation to divert to a more appropriate facility.

# Pediatric Hospital Destination Guidelines

12.7B

## Pediatric Patient Type:

## Appropriate transport destinations

All Trauma Alert Levels

Greenville Memorial

Violent psychiatric patients

Greenville Memorial

Cardiac Arrest or Imminent Arrest

Any Prisma Health Facility

Any St. Francis Hospital Facility

PMC

Post cardiac arrest patients

Greenville Memorial

Sexual assault patients without significant physical trauma

Any Prisma Health Facility

Sexual assault patients with significant physical trauma

Greenville Memorial

Patient requiring a specialist "Ologist", with a related complaint

Greenville Memorial

Severely ill, but not in immediate danger to arrest

Greenville Memorial

Not severely ill, and not meeting other specific patient types above

Any Prisma Health Facility

Any St. Francis Hospital Facility

PMC

### PEARLS:

- Once the destination hospital has been determined, the EMS crew must call the receiving facility via a recorded line as soon as possible. The report should include Age, Sex, Chief complaint, & Vital signs.
- A more complete report should be given for higher acuity patients.
- Any deviation of this Hospital Destination Guideline should be made by the diverting physician on a recorded line.
- The patient's caregiver retains the right to refuse a diversion. In these cases notify the receiving hospital that the diversion was refused by caregiver, and have the caregiver sign a refusal declining the recommendation to divert to a more appropriate facility.
- Any ED can receive a pediatric patient that is in cardiac arrest or imminent arrest.
- Any ED can receive a pediatric patient that is not severely ill and does not meet a specific patient type listed above.

# Miscellaneous Numbers

12.8

## Coroners

On Duty Deputy Coroner:  
864-230-1319

On Duty Supervisor:  
864-399-5173

## Supervisors:

Desk:	864-467-7320
S1 Cell:	864-867-2338
S2 Cell:	864-867-8796
S3 Cell:	864-419-7009
S4 Cell:	864-887-3879
Pothier (201)	864-361-4166
Ragsdale (202)	864-605-1388
Steve Austin (203)	
Thompson (205)	
Kellum (206)	
Heim (207)	
Bailey (208)	
Ravan (209)	
Thome (210)	
Welliver (211)	
Brown (212)	
McElory	

## Clinical Services:

Desk:	864-467-7389
Phil Head (301):	864-915-5993
Neal Hughes (302):	864-467-7326
Austin Freeman (303):	864-509-7190
John LeBlanc (306):	864-270-5646
Jesse Moses (308):	864-361-2802
Jacobe Hayes:	864-813-2552
Raymond Sass (310):	864-467-7619
Shannon Fanning (311)	

## MedCom

864-467-2704(2705): Times  
864-467-8808: Supervisor

## IS Computers

864-467-7488

## SST

864-467-7451



Normal Pediatric Vital Signs

Age Group	Resp	Heart Rate	SBP	Weight (kg)	Weight (lb)
Newborn	30 - 60	100 - 180	50 - 70	2 - 3	4.5 - 7
Infant 1-12 months	20 - 50	80 - 160	70 - 100	4 - 10	9 - 22
Toddler 1-3 yrs.	20 - 35	70 - 150	80 - 110	10 - 14	22 - 31
Preschooler 3-5 yrs.	20 - 30	60 - 120	80 - 110	14 - 18	31 - 40
School Age 6-12 yrs.	15 - 30	60 - 110	80 - 120	20 - 42	41 - 92
Adolescent 13+ yrs.	12 - 20	55 - 110	110 - 120	>50	>110

Pediatric RTS

Components	+2	+1	-1
1. Weight	> 20 kg	10 - 20 kg	< 10 kg
2. Airway patency	Normal	Maintainable	Unmaintainable
3. Systolic blood pressure	> 90 mmHg	90 - 50 mmHg	< 50 mmHg
4. CNS status	Awake	Obtunded/ loss of consciousness	Coma/ decerebrate
5. Open wound	None	Minor	Major/ penetrating
6. Skeletal injury	None	Closed fracture	Open/ multiple fractures

APGAR SCORE			
SIGN	SCORE 0	SCORE 1	SCORE 2
ACTIVITY	FLACCID	SOME FLEXION	WELL FLEXED
PULSE	ABSENT	<100 PER MINUTE	>100 PER MINUTE
GRIMACE	NO RESPONSE	GRIMACE	COUGH/SNEEZE
APPEARANCE	PALE/BLUE	BLUE EXTREMITIES	COMPLETELY PINK
RESPIRATION	ABSENT	WEAK CRY	GOOD CRY
Check at 1 minute and again at 5 minutes			

## Pediatric GCS

Assessed Response	Score
Best eye response	
Spontaneously	4
To verbal stimulation or to touch	3
To pain	2
No response	1
Best verbal response	
Smiles, oriented to sounds, follows objects, interacts	5
Cries but is consolable, inappropriate interactions	4
Inconsistently consolable, moaning	3
Inconsolable, agitated	2
No vocal response	1
Motor	
Normal spontaneous movement	6
Withdraws to touch	5
Withdraws to pain	4
Flexion abnormal	3
Extension, either spontaneous or to painful stimuli	2
Flaccid	1

## List of Chief Complaints:

- 1 Abdominal Pain/Problems
- 2 Allergies (Reactions)/Envenomations
- 3 Animal Bites/Attacks
- 4 Assault/Sexual Assault
- 5 Back Pain (Non-traumatic or non-recent trauma)
- 6 Breathing Problems
- 7 Burns (Scalds)/Explosions (Blast)
- 8 Carbon Monoxide/Inhalation/Hazmat/CBRN
- 9 Cardiac or Respiratory Arrest/Death
- 10 Chest Pain (non-Traumatic)
- 11 Choking
- 12 Convulsions/Seizures
- 13 Diabetic Problems
- 14 Drowning (Near)/Diving/SCUBA Accident
- 15 Electrocution/Lightning
- 16 Eye Problems
- 17 Falls
- 18 Headache
- 19 Heart Problem/A.I.C.D
- 20 Heat/Cold Exposure
- 21 Hemorrhage/Laceration
- 22 Inaccessible Incident/Other Entrapments
- 23 Overdose/Poisoning (Ingestion)
- 24 Pregnancy/Childbirth/Miscarriage
- 25 Psychiatric/Abnormal Behavior/Suicide Attempt
- 26 Sick Person (Specific Diagnosis)
- 27 Stab/Gunshot/Penetrating Trauma
- 28 Stroke (CVA)
- 29 Traffic/Transportation Incidents
- 30 Traumatic Injuries (Specific)
- 31 Unconscious/Fainting (Near)
- 32 Unknown Problem (Man Down)
- 33 Transfer/Interfacility/Palliative Care
- 34 ANCN (Automatic Crash Notification)
- 36 Pandemic/Epidemic/Outbreak (Officially Enacted Triage)
- 37 Interfacility Evaluation/Transfer

## Transportation Codes

- Priority 1: Critical - Lights/Sirens  
 Priority 2: Emergent - Lights/Sirens (Discretion of Crew)  
 Priority 3: Routine - No Lights/Sirens

## GSP Air-traffic Emergency Codes

- Alert 1: Minor electrical/mechanical problem; units standby at FD  
 Alert 2: Aircraft has declared an emergency; units standby at runway  
 Alert 3: An aircraft crash has occurred or is inevitable  
 Alert 4: Hijacking, bomb threats or HAZMAT problems
- Level 1: 1-5 passengers on board  
 Level 2: 6-10 passengers on board  
 Level 3: 11-25 passengers on board  
 Level 4: 26-50 passengers on board  
 Level 5: 51 or more passengers on board

## South Carolina EMS R.A.C.E. Stroke Scale Rapid Arterial occlusion Evaluation Scale

ITEM	Instruction	Result	Score	HIHSS Equivalent
Facial Palsy	Ask patient to show their teeth (smile)	<b>Absent</b> (symmetrical movement) <b>Mild</b> (slight asymmetrical) <b>Moderate to severe</b> (completely asymmetrical)	0 1 2	0-3
Arm Motor Function	Extending the arm of patient 90° (if sitting) or 45° (if supine)	<b>Normal to Mild</b> (limb upheld more than <b>10</b> seconds) <b>Moderate</b> (limb upheld less than <b>10</b> seconds) <b>Severe</b> (patient unable to raise arm against gravity)	0 1 2	0-4
Leg Motor Funtion	Extending the leg of the patient 30° (in supine)	<b>Normal to Mild</b> (limb upheld more than <b>5</b> seconds) <b>Moderate</b> (limb upheld less than <b>5</b> seconds) <b>Severe</b> (patient unable to raise leg against gravity)	0 1 2	0-4
Head & Gaze Deviation	Observe eyes and head deviation to one side	<b>Absent</b> (eye movements to both sides were possible and no head deviation was observed) <b>Present</b> (eyes and head deviation to one side was observed)	0 1	0-2
Aphasia (R side)	Difficulty understanding spoken or written words. Ask patient to follow two simple commands: 1. Close your eyes 2. Make a fist.	<b>Normal</b> (performs both tasks requested correctly) <b>Moderate</b> (performs only 1 of 2 tasks requested correctly) <b>Severe</b> (cannot perform tasks requested correctly)	0 1 2	0-2
Agnosia (L side)	Inability to recognize familiar objects. Ask patient: 1. “Whose arm is this? (while showing the affected arm) 2. “Can you move your arm?”	<b>Normal</b> (recognizes arm and attempts to move arm) <b>Moderate</b> (does not recognize a rm <b>or</b> is unaware of arm) <b>Severe</b> (does not recognize arm <b>and</b> is unaware of arm)	0 1 2	0-2
High likelihood of LVO with a score greater than or equal to 5			RACE SCORE TOTAL	

- **R.A.C.E.** is based on an abbreviated version of the **NIHSS**, the “gold standard” for evaluating stroke victims.
- The maximum score is **9** (not **11**) because the evaluation is done on the left or right side not both simultaneously.
- The **R.A.C.E.** is a 5 of 6 item scale. The last item is 1 of 2 based on which side the patient has deficits on previous scale items.
- The **NIHSS** equivalent is provided for the benefit of receiving facility. The **NIHSS** score may be higher than the “snap shot” provided in the **R.A.C.E.** because the **NIHSS** evaluates additional areas not covered in the **R.A.C.E.** which is short by design for EMS field use.
- The **R.A.C.E.** is a universal **quantitative** tool that is needed to determine the **severity** of a stroke and to identify strokes with large vessel occlusions (LVO) which would benefit going to a Comprehensive Stroke Center (CSC). This is similar to a 12-lead EKG identifying a STEMI and being transported to a PCI Cardiac Center for intervention.
- The Cincinnati (CPSS), the F.A.S.T., the Miami (MENDS), the Los Angeles (LAPSS) stroke scales are good scales that offer high degree of sensitivity for strokes, but they are all **qualitative** scores (positive or negative) and not **quantitative** (severity).
- The cut-score of 4 is based on the significant global accuracy of **R.A.C.E.** predicting an LVO and its close correlation to the **NIHSS**.
- A free online tool is available to calculate a **R.A.C.E.** score at: <http://www.rccc.eu/race/RACEen.html>
- For the study behind the **R.A.C.E.** see <http://stroke.ahajournals.org/content/45/1/87.full>

## Cincinnati Stroke Scale

A system used to diagnose the presence of a stroke in a patient. It tests 3 signs for abnormal findings which may indicate that the patient is having a stroke. **If any one of the 3 tests shows abnormal findings, the patient may be having a stroke** and should be transported to a hospital as soon as possible.

### Facial droop:

Have the person smile or show his or her teeth. If one side doesn't move as well as the other so it seems to droop, that could be sign of a stroke.

- Normal: Both sides of face move equally
- Abnormal: One side of face does not move as well as the other (or at all)

### Arm drift:

Have the person close his or her eyes and hold his or her arms straight out in front for about 10 seconds. If one arm does not move, or one arm winds up drifting down more than the other, that could be a sign of a stroke.

- Normal: Both arms move equally or not at all
- Abnormal: One arm does not move, or one arm drifts down compared with the other side

### Speech:

Have the person say, "You can't teach an old dog new tricks," or some other simple, familiar saying. If the person slurs the words, gets some words wrong, or are unable to speak, that could be sign of stroke.

- Normal: Patient uses correct words with no slurring
- Abnormal: Slurred or inappropriate words or mute



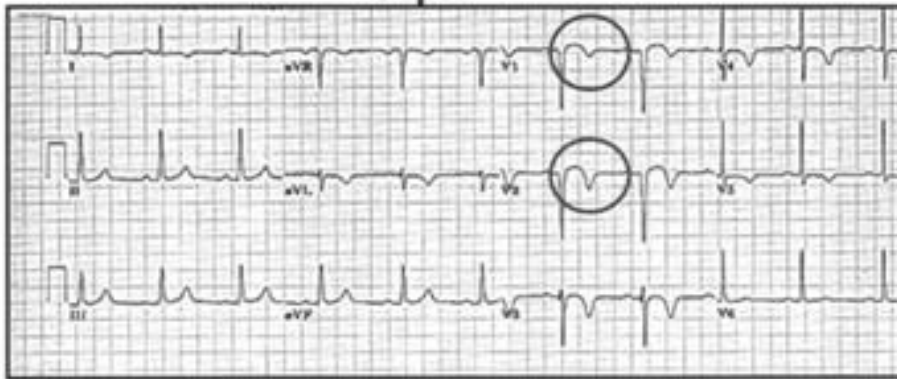
Lead I	aVR	V1	V4
Lead II	aVL	V2	V5
Lead III	aVF	V3	V6
Infarction	Wave Abnormality	ECG Segments	Occlusion
Inferior	ST Elevation	II, III, aVF	RCA
Septal	ST Elevation	V1, V2	LAD of LCA
Anterior	ST Elevation	V3, V4	LAD of LCA
Lateral	ST Elevation	I, aVL, V5, V6	LCx of LCA
Posterior	ST ↓, Tall R wave	V1, V2	RCA &/or LCx

## Inferior MI



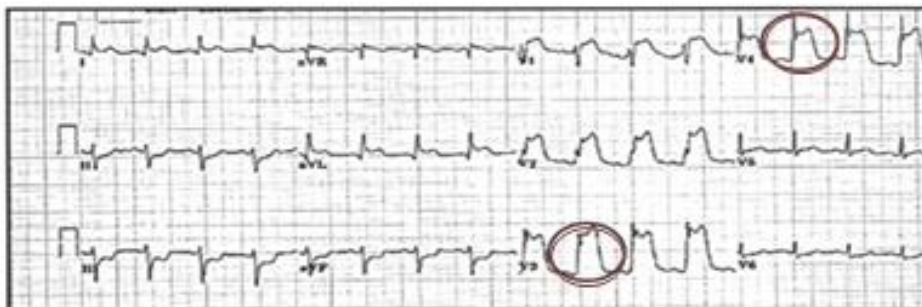
ST elevation 2, 3, AVF

## Septal MI



ST elevation V1 & V2

## Anterior MI



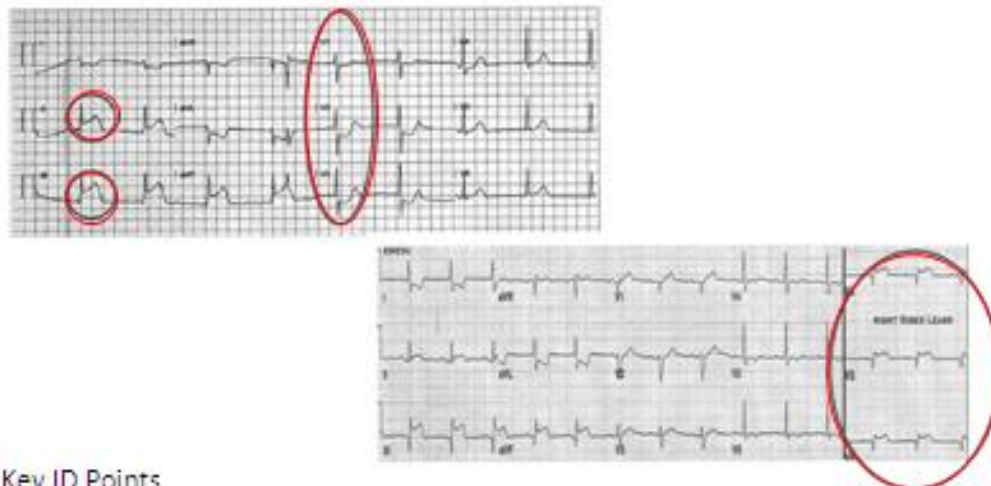
ST elevation V3 & V4

# Lateral MI



ST elevation V5 & V6, I & aVL

# Inferior MI with Right Ventricular Involvement



## Key ID Points

- ST elevation in III > II
- Reciprocal ST depression pattern in V1, V2, V3
- ST elevation on right sided RV leads on 15 lead EKG



Axis	Lead I	Lead II	Lead III	Comments
<b>Normal Axis</b> 0 to 90	∧	∧	∧	
<b>Physiologic Left Axis</b> 0 to -40	∧	∧ ∨	∨	
<b>Pathological Left Axis</b> -40 to -90	∧	∨	∨	<b>Anterior Hemiblock</b>
<b>Right Axis</b> 90-180	∨	∧ ∨	∧	<b>Posterior Hemiblock</b>
<b>Extreme Right Axis</b>	∨	∨	∨	<b>Ventricular Origin</b>

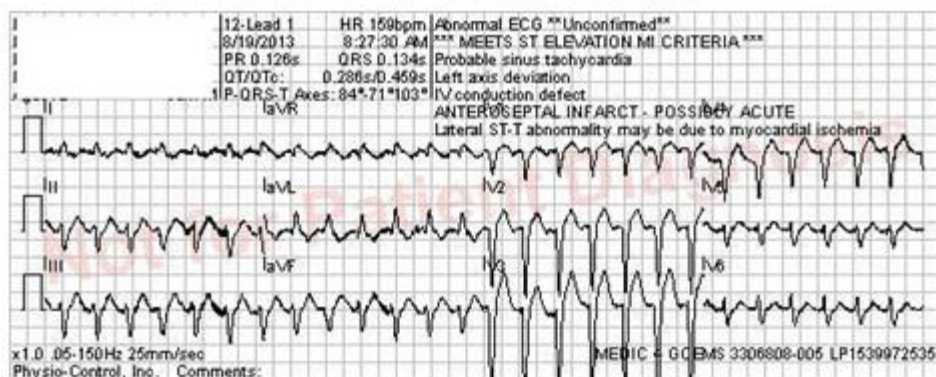
## Right Bundle Branch Block



### Key ID Points

- QRS looks wide with duration >120
- From J point read V1, right to left
- If 1<sup>st</sup> deflection from J point is up = RBBB
- Look at QRS Axis for LAD or RAD
- Left Axis Deviation (LAD) >-30 = Anterior hemiblock
- Right Axis Deviation (RAD) >90 = Posterior hemiblock
- LAD or RAD + RBBB = Bifascicular block
- RBBB may be a STEMI

## Left Bundle Branch Block



### Key ID Points

- QRS looks wide with duration >120
- From J point read V1, right to left
- If 1<sup>st</sup> deflection from J point is down = LBBB
- LBBB is not a STEMI

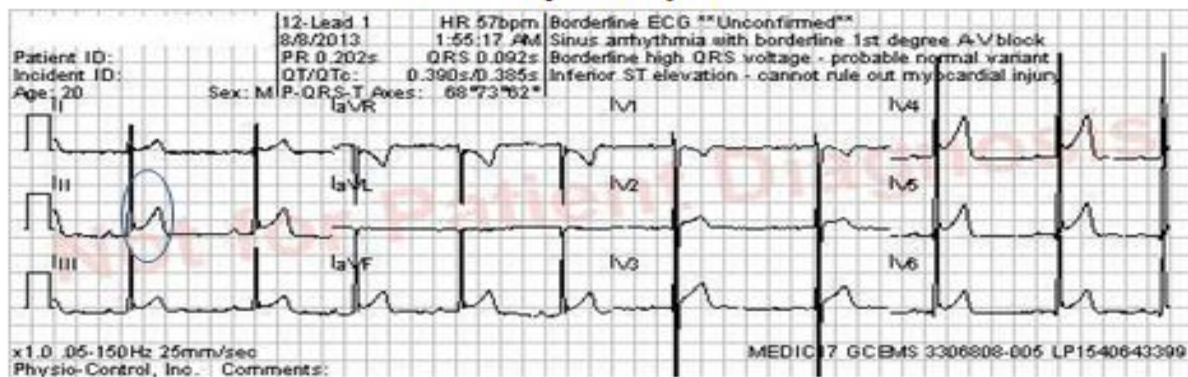
# Left Ventricular Hypertrophy



## Voltage Based Criteria

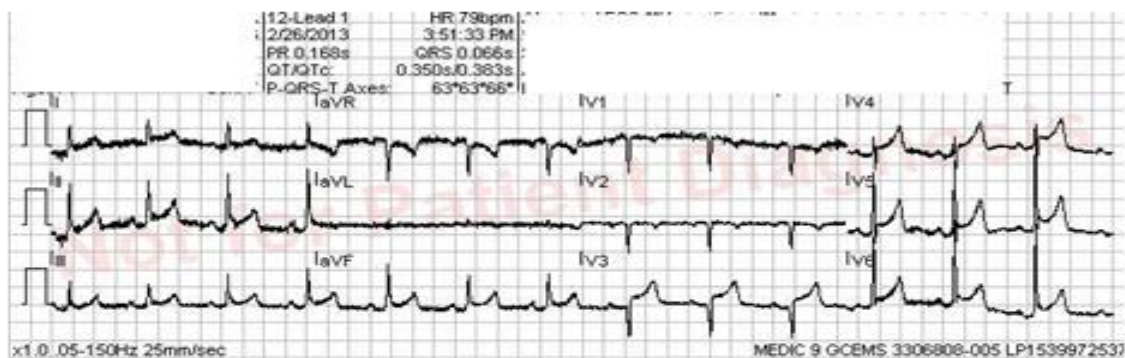
- Lead I: R wave >14
- Lead aVR: S wave >15
- Lead aVL: R wave >12
- Lead aVF: R wave >21
- Lead V5: R wave >26
- Lead V6: R wave >20

# Early Repol



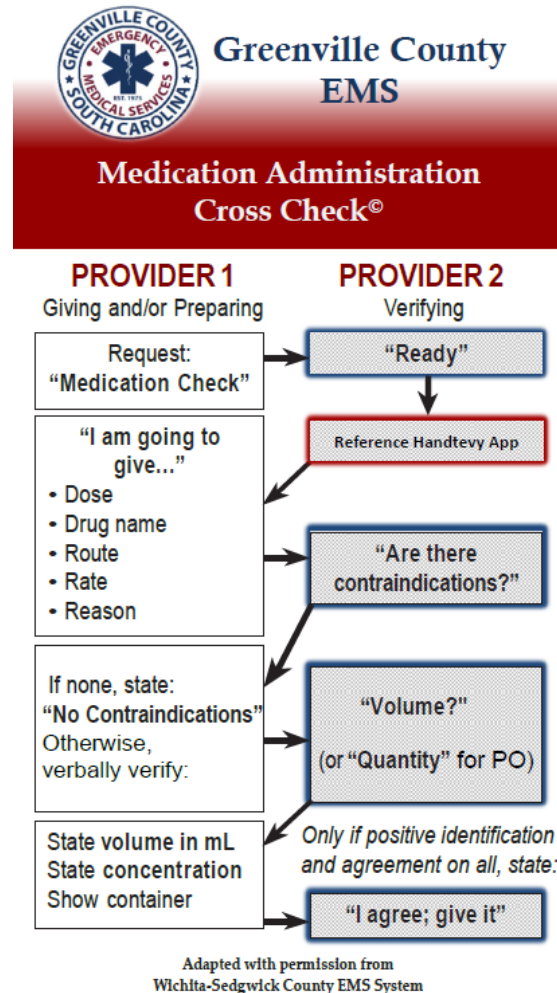
- Depressed and lengthened PR interval
- Concave ST segment elevation
- Global or not following strain pattern
- May or may not experience pain

# Pericarditis



- Depressed and lengthened PR interval
- Concave ST segment elevation
- Global or not following strain pattern
- PAIN IS DIFFERENT
  - Pain decreases upon leaning forward
  - Worsen upon drinking

**Acetaminophen (Tylenol, Feverall, Panadol)**  
**Adenosine (Adenocard)**  
**Albuterol Sulfate (Ventolin/Proventil)**  
**Amiodarone (Cordarone)**  
**Aspirin (Children's chewable aspirin)**  
**Atropine Sulfate**  
**Blood Products**  
**Calcium Gluconate (Kalcinate)**  
**Ceftriaxone (Rocephin)**  
**Combivent (DuoNeb)**  
**Dextrose 10% (D10, 10%)**  
**Dextrose 50% (D50, 50%, Dextrose)**  
**Diazepam (Valium)**  
**Diltiazem (Cardizem)**  
**Diphenhydramine (Benadryl)**  
**Dopamine (Intropin)**  
**Epinephrine (Adrenalin)**  
**Etomidate (Amidate)**  
**Fentanyl (Sublimaze)**  
**Glucagon USP (GlucaGen)**  
**Heparin Sodium Injection**  
**Ketamine (Ketalar)**  
**Lidocaine (Xylocaine)**  
**Lorazepam (Ativan)**  
**Magnesium Sulfate (Magnesium)**  
**Methylprednisolone (Solumedrol)**  
**Metoprolol (Lopressor)**  
**Midazolam (Versed)**  
**Morphine Sulfate**  
**Naloxone (Narcan)**  
**Nitroglycerin (Nitro-Bid, Nitrostat, Nitron)**  
**Nitrous Oxide (Nitronox) Norepinephrine (Levophed)**  
**Oxytocin (Pitocin)**  
**Oxygen**  
**Piperacillin / Tazobactam (Zosyn)**  
**Pralidoxime (Protopam)**  
**Racemic Epinephrine (MicroNEFIN, Vaponephrine)**  
**Rocuronium (Zemuron)**  
**Sodium Bicarbonate (NaHCO<sub>3</sub>) Sodium Chloride 0.9% (Normal Saline)**  
**Succinylcholine (Anectine)**  
**Terbutaline (Brethine)**  
**Tetracaine (Ophthalmic Drops)**  
**Toradol (Ketorolac)**  
**Tranexamic Acid (TXA) (Cyklokapron)**  
**Vecuronium Bromide (Norcuron)**  
**Ziprasidone (Geodon)**  
**Zofran (Ondansetron)**





## Level I Criteria – Adults (Ages 16-64)

1. Glasgow coma score (GCS)  $\leq$  to 11
2. Injury with associated tachycardia & poor perfusion (HR >100)
3. Systolic BP < 90
4. Respiratory rate <10 or >29, respiratory distress, intubated, flail chest, or pleural decompression
5. Penetrating injury/wound to head, neck, torso, or extremities proximal to the elbow or knee
6. Pelvic Fracture
7. Paralysis related to trauma
8. Crushed, degloving, mangled, or pulseless extremity proximal to the elbow or knee
9. Full or partial thickness burns > 20% TBSA, inhalational injury, or airway concern
10. Electrocution with high voltage or > than household current
11. Blood product administration related to trauma
12. Discretion of any trauma team member

## Level II Criteria – Adults (Ages 16-64)

1. GCS 12 or 13
2. Falls > 15 feet
3. High speed auto or motorcycle crash (55 mph or greater), with significant vehicle damage and suspected injuries (e.g., non-ambulatory)
4. Auto-pedestrian/auto-bicycle > 10mph with significant impact & injuries
5. Active bleeding requiring a tourniquet, wound packing, or uncontrolled hemorrhage
6. Fractures  $\geq$  2 open and/or long bone, excluding hands and feet
7. Full or partial thickness burns between 10% to 20% TBSA or Burns to Face
8. Pregnancy > 20 weeks with Abdominal pain/vaginal bleeding/seatbelt sign and/or active labor (with OB activation)
9. Discretion of any trauma team member

## Level III Criteria – Adults – (seen by the EM Faculty) (Ages 18-64)

1. Ejection from automobile without L1 or L2 criteria
2. Moped/bicycle > 25 mph without L1 or L2 criteria
3. Death of a person in the same passenger compartment
4. A trauma patient with any of the following should be considered:
  - a. Pregnancy – >20 weeks not meeting L1 or L2 criteria
5. Discretion of any trauma team member

**Continued on next page**

## Level I Criteria - Pediatrics (Ages 0-15)

1. Glasgow coma score (GCS)  $\leq$  to 11
2. Injury with associated tachycardia & poor perfusion
3. Systolic BP  $\leq 70 + 2 \times$  (age in years) up to 10 years
  - a. 11 – 17 years - systolic B/P  $\leq 90$
4. Respiratory distress, intubated, flail chest, or pleural decompression
5. Penetrating injury/wound to head, neck, torso, or extremities proximal to the elbow or knee
6. Pelvic Fracture
7. Paralysis related to trauma
8. Crushed, degloving, mangled, or pulseless extremity proximal to the elbow or knee
9. Full or partial thickness burns  $> 20\%$  TBSA, inhalational injury, or airway concern
10. Electrocution with high voltage or  $>$  than household current
11. Blood product administration related to trauma
12. Discretion of any trauma team member

## Level II Criteria – Pediatrics (Ages 0-15)

1. GCS 12 or 13
2. Falls  $> 5$  feet (consider height of object)
3. High speed auto or motorcycle crash (55 mph or greater), with significant vehicle damage
4. MCC, ATV, Moped, Golf Cart, Go-cart, Auto-pedestrian/auto-bicycle with significant impact
5. Active bleeding required a tourniquet, wound packing, or uncontrolled hemorrhage
6. Fractures  $\geq 2$  open and/or long bone, excluding hands and feet
7. Full or partial thickness burns between 10% to 20% TBSA or Burns to Face
8. Significant neurological deficit
9. Discretion of any trauma team member

## Level III Criteria – Pediatrics – (seen by the EM Faculty) (Ages 0-17)

1. Ejection from automobile without L1 or L2 criteria
2. Seatbelt sign or potential handlebar injury
3. Rollover or Death of a person in the same passenger compartment
4. Discretion of any trauma team member

**Continued on next page**

## Level I Criteria - Geriatrics (Age > 65) \_

A Level 1 (full) alert should be activated on any patient meeting one or more of the following criteria:

1. Glasgow Coma Score (GCS)  $\leq$  to 11
2. Injury with associated tachycardia & poor perfusion (HR  $\geq$  90)
3. Systolic BP < 110
4. Respiratory distress, intubated, flail chest, or pleural decompression
5. Penetrating injury/wound to head, neck, torso, or extremities proximal to the elbow or knee
6. Pelvic Fracture
7. Non-ground level falls > 5 feet
8. Paralysis related to trauma
9. Crushed, degloving, mangled, or pulseless extremity proximal to the elbow or knee
10. Full or partial thickness burns > 20% TBSA, inhalational injury, or airway concern
11. Electrocution with high voltage or > than household current
12. Blood product administration related to trauma
13. Discretion of any trauma team member

## Level II Criteria – Geriatrics (Age > 65) \_

1. GCS 12 or 13
2. High speed auto or motorcycle crash (55 mph or greater) with significant vehicle damage and suspected injuries (e.g., non-ambulatory)
3. Auto-pedestrian/auto-bicycle >10 mph with significant impact & injuries
4. Active bleeding requiring a tourniquet, wound packing, or uncontrolled hemorrhage
5. Fractures  $\geq$  2 open and/or long bone, excluding hands and feet
6. Full or partial thickness burns between 10% to 20% TBSA or Burns to Face
7. Discretion of any trauma team member

## Level III Criteria – Geriatrics – (seen by the EM Faculty) (Age $\geq$ 65)

1. Ejection from automobile without L1 or L2 criteria
2. Moped/bicycle > 25 mph without L1 or L2 criteria
3. Death of a person in the same passenger compartment
4. Discretion of any trauma team member

# Drugs

# Adult

# Pediatric

## Acetaminophen

(Tylenol, Feverall, Pandol)

### GCEMS Protocol:

Pediatric Fever/Infection

### Indications:

- Relief of mild to moderate pain.
- Fever reduction.

### Contraindications:

- Known allergy.
- Caution in patients with liver and renal disease.

### Side Effects:

None when administered in the therapeutic dosage range.

- Not Indicated

- 15 mg/kg PO

(Wt in kg/2 = dose in mL)

Weight:	Milligram Dosage	160 mg/5 mL
5-8 lbs	40 mg	1.25 mL
9-10 lbs	60 mg	1.8 mL
11-16 lbs	80 mg	2.5 mL
17-21 lbs	120 mg	3.75 mL
22-26 lbs	160 mg	5 mL
27-32 lbs	200 mg	6.25 mL
33-37 lbs	240 mg	7.5 mL
38-42 lbs	280 mg	8.75 mL
43-53 lbs	320 mg	10 mL
54-64 lbs	400 mg	12.5 mL
65-75 lbs	480 mg	15 mL
76-86 lbs	560 mg	17.5 mL
87-95 lbs	640 mg	20 mL

## Adenosine

(Adenocard)

### GCEMS Protocol:

Sustained V-Tach  
Narrow Complex Tachycardia  
Ped Unstable Tachycardia

### Indications:

- PSVT / SVT

### Contraindications:

- Second or third degree AV block

### Side Effects:

Short-lasting, 2<sup>nd</sup> or 3<sup>rd</sup> degree AV block, transient asystole, various arrhythmias lasting only a few seconds.

- 12 mg rapid IV/IO bolus initial dose
- If SVT rhythm has not changed after 5 minutes, may repeat with a second dose of 12mg rapid IV/IO bolus

- 0.1 mg/kg (over 1-2 seconds) IV/IO followed by rapid saline flush; max initial dose of 6mg
- 0.2mg/kg within 1-2 minutes of continuing SVT-given rapid IV/IO bolus; max single dose 12mg

The onset of the effect is generally within less than one minute

## Albuterol Sulfate

(Ventolin, Proventil)

### GCEMS Protocol:

multiple

### Indications:

- Acute bronchospasm
- Cardiac arrest associated with asthma

### Contraindications:

- Hypersensitivity to any of the contents of the inhalation solution

### Side Effects:

Tremors, dizziness, nervousness, headache, nausea, tachycardia

- 5mg via handheld nebulizer or nebulizer mask; may repeat once for a total of 10mg

**\*Requires OLMC for EMT to repeat dose.\***

- 2.5mg via handheld nebulizer or nebulizer mask; may repeat once for a total of 5mg

**\*Requires OLMC for EMT to repeat dose.\***

**Amiodarone**

(Cordarone)

**GCEMS Protocol:**

Multiple

**Indications:**

- Shock resistant V-fib or pulseless V-Tach
- Unstable V-Tach

**Contraindications:**

- Hypersensitivity to any of the contents
- Unmanaged cardiogenic shock
- Marked sinus bradycardia
- 2<sup>nd</sup> or 3<sup>rd</sup> degree AV blocks

**Side Effects:**

Hypotension, bradycardia, AV block, asystole, PEA, hepatotoxicity

**Pulseless VF/VT:**

- 300mg IV/IO bolus; repeat once at 150mg IV/IO bolus

**VT with pulse:**

- 150mg in 50mL NS or D5W administered through a 10 gtt set over 10 minutes.
- May repeat once if patient remains in unstable VT to a total dose of 300mg over 20 minutes.

**Maintenance Drip:**

- 1mg/minute = 150mg in 50 mL NS or D5, administered through a 60 gtt set at 20 gtts per minute.

**Pulseless VF/VT:**

- 5mg/kg IV/IO bolus

**Aspirin**

(ASA, Children's chewable aspirin)

**GCEMS Protocol:**

Acute coronary syndrome

**Indications:**

- Myocardial infarction
- Chest pain suspicious of cardiac origin

**Contraindications:**

- Active ulcers
- Hypersensitivity to Aspirin

**Side Effects:**

Allergic reaction, nausea/vomiting, indigestion, heartburn, tinnitus

- 324mg PO (four 81mg baby ASA)

Not approved

**Atropine Sulfate****GCEMS Protocol:**

Multiple

**Indications:**

- Anticholinergic drug used in bradycardias
- Organophosphate poisoning
- Pediatric: Symptomatic bradycardia secondary to AV block or vagal activity; 2<sup>nd</sup> line after Epinephrine for bradycardia due to poor perfusion of hypotension

**Contraindications:**

- Tachycardia
- Hypertension (rule out head injury first)

**Side Effects:**

Tachycardia, dry mouth, thirst, flushing of skin, blurred vision, headache, pupillary dilation, urine retention

**Bradycardia:**

- 1 mg IV administration; repeat every 3-5 minutes to a total of 3mg

**Organophosphate Poisoning:**

- To block parasympathetic response: 1-2mg IV; repeated Q 5 minutes until a decrease in secretions are observed or a total dose of 6mg

**Bradycardia:**

- 0.02mg/kg (0.2 mL/kg) IV; minimum of 0.1 mg
- Maximum single dose 0.5 mg child; 1 mg adolescent
- May repeat once

**Organophosphate Poisoning:**

- To block parasympathetic response: Children 0.05 to 0.1 mg/kg loading dose; Adolescents 2mg loading dose
- Repeat every 10-15 minutes until rales and bronchial secretions resolves



**Calcium Gluconate**

(Kalcinate)

**GCEMS Protocol:**

Multiple

**Indications:**

- Calcium channel blocker overdose
- Magnesium Sulfate drip toxicity
- Certain types of arrest
- Known hypocalcemia or hypokalemia

**Contraindications:**

- Use with extreme caution in patients taking digitalis

**Side Effects:**

Hypotension, bradycardia, arrhythmia, cardiac arrest, chalky or metallic taste, feeling that a "wave of heat" is passing through the body.

- 10-20 mL IV/IO slow administration

- 50-100 mg/kg IV/IO slow administration

**Ceftriaxone**

(Rocephin)

**GCEMS Protocol:**

Sepsis

Open Fractures

**Indications:**

- SIRS criteria x2 and known or suspected pulmonary source of infection

**Contraindications:**

- Allergy to Ceftriaxone, penicillin or their derivatives

**Side Effects:**

- **Sepsis:** 2 G mixed in 50 mL or 100 mL of NS infused IV/IO over 10 minutes
- **Open Fractures:** 2 G mixed in 50 mL of NS infused IV/IO over 10 minutes

**Open Fractures:** 50 mg/kg to a max dose of 1 g IV over 10 minutes.

**Combivent**

(DuoNeb)

**GCEMS Protocol:**

Reactive Airway Disease

**Indications:**

- Bronchospasm
- COPD

**Contraindications:**

- Hypersensitivity to Atrovent, Atropine or its derivatives
- Hypersensitivity to Albuterol

**Side Effects:**

Tachycardia, palpitations, eye pain, urinary retention, uticardia, bronchitis

- 3.5 mg nebulized; may not repeat

- 3.5 mg nebulized; may not repeat

## Drugs

## Adult

## Pediatric

<p><b><u>Dextrose 10%</u></b> (D10)</p> <p><b><u>GCEMS Protocol:</u></b> Multiple</p> <p><b><u>Indications:</u></b></p> <ul style="list-style-type: none"> <li>• Suspected hypoglycemia</li> <li>• Altered LOC</li> <li>• Coma/seizure of unknown etiology</li> </ul> <p><b><u>Contraindications:</u></b></p> <ul style="list-style-type: none"> <li>• Intracranial hemorrhage</li> <li>• Known CVA</li> </ul> <p><b><u>Side Effects:</u></b> Local irritation, may precipitate severe neurologic symptoms in alcoholics</p>	<ul style="list-style-type: none"> <li>• 250 mL IV; may repeat once if still unresponsive and low BGL</li> </ul>	<ul style="list-style-type: none"> <li>• 5 mL IV; may repeat once if still unresponsive and low BGL</li> </ul>
<p><b><u>Dextrose 50%</u></b> (D50, 50% Dextrose)</p> <p><b><u>GCEMS Protocol:</u></b> Multiple</p> <p><b><u>Indications:</u></b></p> <ul style="list-style-type: none"> <li>• Suspected hypoglycemia</li> <li>• Altered LOC</li> <li>• Coma/seizure of unknown etiology</li> </ul> <p><b><u>Contraindications:</u></b></p> <ul style="list-style-type: none"> <li>• Intracranial hemorrhage</li> <li>• Known CVA</li> </ul> <p><b><u>Side Effects:</u></b> Local irritation, may precipitate severe neurologic symptoms in alcoholics, causes local tissue necrosis if IV infiltrates</p>	<ul style="list-style-type: none"> <li>• 25 Grams slow IV/IO administration given on a case by case basis per Paramedic discretion</li> </ul>	<ul style="list-style-type: none"> <li>• Diluted (1:1) with NS; for a concentration of D25</li> <li>• Dose of 0.5-1 Grams/kg (2-4 mL/kg) slow IV/IO or rectum administration</li> <li>• <b>Given on a case by case basis per Paramedic discretion</b></li> </ul>
<p><b><u>Diazepam</u></b> (Valium)</p> <p><b><u>GCEMS Protocol:</u></b> Alternative to Lorazepam in cases of drug shortage</p> <p><b><u>Indications:</u></b></p> <ul style="list-style-type: none"> <li>• Major motor seizures</li> <li>• Status epilepticus</li> <li>• Premedication prior to cardioversion, transcutaneous pacing</li> <li>• Skeletal muscle relaxant</li> <li>• Acute anxiety states</li> <li>• Medication for combative patients and difficult intubations</li> </ul> <p><b><u>Contraindications:</u></b></p> <ul style="list-style-type: none"> <li>• Respiratory depression</li> </ul> <p><b><u>Side Effects:</u></b> Respiratory/cardiac arrest, decreased LOC, hypotension</p>	<ul style="list-style-type: none"> <li>• 1-5 mg IV/IO/IM to a maximum of 10 mg</li> </ul>	<ul style="list-style-type: none"> <li>• 0.2 mg/kg IV/IO/IM titrated to a single max dose of 5 mg; may be repeated once every five minutes to a total maximum dose of 10 mg</li> </ul>

# Drugs

# Adult

# Pediatric

## Diltiazem

(Cardizem)

### GCEMS Protocol:

Narrow Complex Tachycardia

### Indications:

- Rate control in refractory atrial fibrillation and SVT

### Contraindications:

- Concurrent or recent use of beta blockers

### Side Effects:

Hypotension, heart block

- 20 mg IV/IO over 2 minutes if systolic BP >90 mmHg
- If uncontrolled after 15 minutes from initial dose, administer 25 mg IV/IO over 2 minutes if systolic BP >90 mmHg

\*\*\*If Diltiazem is unavailable, then consider **Metoprolol 5 mg IV/IO slow push**; may repeat a 2nd dose of 5 mg for a max total dose of 10 mg.

Not approved

## Diphenhydramine

(Benadryl)

### GCEMS Protocol:

Multiple

### Indications:

- Anaphylaxis
- Allergic reaction
- Urticaria
- Extra pyramidal reaction

### Contraindications:

- Asthma
- COPD
- Pregnancy
- Nursing mothers
- Acute glaucoma

### Side Effects:

Sedation, dries bronchial secretions, blurred vision, headache, palpitations

- 25 mg IV/ 50 IM

- 1 mg/kg IV/IM; maximum of 30 mg

## Dopamine

(Intropin)

### GCEMS Protocol:

Multiple

### Indications:

- Cardiogenic shock associated with hypotension

### Contraindications:

- Hypovolemic shock where complete fluid resuscitation has not occurred
- Uncorrected tachydysrhythmias or V-fib

### Side Effects:

Tachydysrhythmias, ectopy, headache, angina, nausea/vomiting

- 5-20 mcg/kg/min IV/IO

- 2-5 mcg/kg/min IV/IO initially, up to 20 mcg/kg/min titrated to B/P
- **\*\*DIRECT MEDICAL ORDER REQUIRED\*\***

Dopamine 1600 mcg concentration drip chart							
Pt Weight (kg) Infusion Rate (mcg/kg/min)							
	5 mcg		10 mcg		15 mcg		20 mcg
10 kg	2		4		6		8
20 kg	4		8		11		15
30 kg	6		11		17		23
40 kg	8		15		23		30
50 kg	9		19		28		38
60 kg	11		23		34		45
70 kg	13		26		39		53
80 kg	15		30		45		60
90 kg	17		34		51		68
100 kg	19		38		56		75
110 kg	21		41		62		83
120 kg	23		45		68		90
130 kg	25		49		73		98
140 kg	26		53		79		105
150 kg	28		56		85		113
Mix 80 mg (2 mL) Dopamine in 50 mL NS bag = 1600 mcg concentration use 60 gtt set for desired rate							

Mix 80 mg (2 mL) Dopamine in 50 mL NS bag = 1600 mcg concentration use 60 gtt set for desired rate

**Epinephrine**

(Adrenalin)

**GCEMS Protocol:**

Multiple

**Indications:**

- V-fib / Pulseless V-tac
- Asystole
- Pulseless electrical activity (PEA)
- Anaphylaxis
- Bronchospasm

**Contraindications:**

- There are no contraindications to the use of Epinephrine in the situation of cardiac arrest

**Side Effects:**

Palpitations, hypertension, dysrhythmias, anxiety, tremors

**Cardiac Arrest:**

- 1 mg 1:10,000 solution IV/IO every 3-5 minutes. Max 4 doses. Contact medical control to request more doses.

**Anaphylactic Shock / Allergic Reaction:**

- **ALS:** If patient has respiratory distress and other signs of an allergic reaction 0.5 mg 1:1000 solution IM; may repeated every 15 minutes up to three times for a total of 4 doses.
- Contact Medical Control if patient is hemodynamically unstable, for orders of 1:10,000 solution 0.05 mg to 0.1 mg IV.
- **BLS:** See COG 8.3.1 for Epi pen alternative kit and dose.

**Hypotension:**

- 10-20 mcg (1-2 ml) 1:100,000 q3-5m

**Bradycardia:**

- 2-10 mcg/min infusion titrate

**Cardiac Arrest:**

- 0.01 mg/kg (0.1 mL/kg) 1:10,000 solution IV/IO every 3-5 minutes until ROSC

**Bradycardia:**

- 0.01 mg/kg (0.1 mL/kg) 1:10,000 solution IV/IO every 3-5 minutes until rhythm changes or physician directs otherwise

**Anaphylactic Shock / Allergic Reaction:**

- **ALS:** If patient is under 3 years of age contact Medical Control and request an order of 0.01 mg/kg 1:1,000 solution up to a max of 0.5 mg IM
- If patient has respiratory distress and other signs of an allergic reaction; may be repeated up to three times every 15 minutes or a total of 4 doses
- Contact Medical Control if patient is hemodynamically unstable, for orders of 1:10,000 solution 0.3 mg IV
- **BLS:** See COG 8.3.1 for Epi pen alternative kit and dose.

**Hypotension:** Consider Push Dose EPI OLMC\***Etomidate**

(Amidate)

**GCEMS Protocol:**

Rapid Sequence Induction

**Indications:**

- For use in RSI protocol for anesthesia induction

**Contraindications:**

- Known sensitivity to the drug

**Side Effects:**

Transient venous pain, skeletal

- 0.3 mg/kg slow IV push over 30 seconds; max dose 30 mg.

No approved

**Fentanyl**

(Sublimaze)

**GCEMS Protocol:**

Multiple Protocols

**Indications:**

- AMI
- Severe pain in selective situations

**Contraindications:**

- Severe Head Injury
- Asthma and End-Stage Lung Disease
- Respiratory depression
- Untreated Hypotension

**Side Effects:**

Respiratory depression, nausea/vomiting

- 2 mcg/kg IV/IO/IM/IN can repeat once. Max single dose of 100 mcg, Max Dose 200 mcg

- Age  $\geq$  5 years 1 mcg/kg up to 50 mcg. May repeat once in 5 minutes. **Max Dose= 100 mcg**

- **\*\*Direct Medical Control Order for ages <5 years old\*\***

**Glucagon**

(GlucaGen)

**GCEMS Protocol:**

Multiple

**Indications:**

- Hypoglycemia
- Beta blocker overdose

**Contraindications:**

- Hypersensitivity
- Insulinoma
- Pheochromocytoma

**Side Effects:**

Relatively free of adverse reactions except for occasional nausea/vomiting; urticaria, respiratory distress, and hypotension have been reported

**Altered Mental Status/Diabetic Emergencies,****Seizures:**

- 1 mg IM/SQ

**Beta Blocker Overdose:**

- 2 mg IV/IO/IM

- 0.1 mg/kg IM; maximum 1 mg

**Heparin Sodium Injection****GCEMS Protocol:**

Acute Coronary Syndrome  
Post Resuscitation

**Indications:**

- Anticoagulation therapy

**Contraindications:**

- Severe thrombocytopenia
- Uncontrollable active bleeding

**Side Effects:**

No immediate side effects except hypersensitivity reaction. Late side effects include minor or major hemorrhage, including intracerebral hemorrhage

**STEMI:**

- 5000 units IV/IO

\*OLMC if not alert and unresponsive

Not approved

**Ketamine**

(Ketalar)

**GCEMS Protocol:**

- Multiple

**Indications**

- Procedural
- Chemical restraint
- Pre-intubation induction agent
- Post intubation sedation

**Contraindications:**

- Age < 12
- SBP  $\geq$ 210 or  $\geq$ 110 Diastolic

**Side Effects:**

tachycardia, increased BP, Hallucinations, delirium, involuntary quivering, nightmares.

**Pharmacokinetics**

onset: <1min IV, <5 min (IM)

Duration: 10-15min (IV) 20-30 min (IM)

**Procedural Sedation**

1 mg/kg IV Max dose 100 mg.

**Rapid Sequence Induction / Sedation post**

2 mg/kg IV; Max dose 200 mg. Sedation may be repeated in 15 minutes.

**Chemical Restraint**

4 mg/kg IM; max dose 400 mg.

**Pain Management**

0.3mg/kg IV/IO/IN; 30mg max single dose; may repeat once after 15 minutes.

Not approved

## Drugs

## Adult

## Pediatric

**Levophed**

(Norepinephrine)

**GCEMS Protocol:**

- Multiple

**Indications**

- Cardiogenic shock
- Neurogenic shock
- Septic Shock
- Anaphylactic Shock

**Contraindications:**

- Hypotension due to uncontrolled hemorrhagic shock
- Vascular Thrombosis
- Profound hypoxia

**Side Effects:**

Bradycardia, Anxiety, Shortness of Breath, and Nausea/Vomiting

- Gtt: 4 mg in 250 mL bag 2-30 mcg/min; max of 30 mcg/min IV/IO

Not approved

**Lidocaine**

(Xylocaine)

**GCEMS Protocol:**

Multiple

**Indications:**

- Pain management for IO access
- Cardiac Arrest

**Contraindications:**

- Allergy to -caine medications

**Side Effects:**

Hypotension, decreased LOC, irritability, muscle twitching, eventually seizures

- 40 mg (2mL) 2% slow injection; may repeat up to 60 mg (3 mL)
- 1 mg/kg IV/IO; for persistent V-fib/V-tach after max Amiodarone dose given.

- 0.5 mg/kg (Max single dose 20 mg) 2% slow injection; may repeat up to a total 40 mg

**Lorazepam**

(Ativan)

**GCEMS Protocol:**

Multiple \*\*\*Stocked only if a supply shortage occurs

**Indications:**

- Major motor seizures
- Status epilepticus
- Acute anxiety states
- Skeletal muscle relaxant

**Contraindications:**

- Respiratory depression

**Side Effects:**

Respiratory/Cardiac arrest, decreased LOC, hypotension

- Up to total of 4 mg slow IV/IO/IM (over 2-5 minutes)

- Up to total of 0.1 mg/kg IV/IO/IM slow (over 2-5 minutes); maximum 4 mg

**Magnesium Sulfate****GCEMS Protocol:**

- Multiple

**Indications:**

- Torsade's de Pointes/persistent V-fib/v-tach
- Digitalis induced ventricular arrhythmias
- As an anticonvulsant in eclampsia
- Suspected hypo magnesia
- Severe exacerbation of reactive airway disease

**Contraindications:**

- Heart blocks
- Anuria
- Active labor
- hypomagnesaemia

**Side Effects:**

Bradycardia, hypotension, hypoflexia, drowsiness, respiratory depression

**Reactive Airway Disease/Torsade's/V-tach/v-fib:**

- 2 grams (4 mL) IV/IO over 2-3 minutes

**Eclampsia/Pre-eclampsia:**

- 4 grams (8 mL) IV over 2-3 minutes
- 8 grams (16 mL) IM if an IV is unobtainable  
– 4 grams in each dorsogluteal muscle (upper buttock)

Not approved

Magnesium insufficiency should be suspected in patients who use diuretics and in patients with poor dietary habits, poor nutrition, or poor dietary intake (may be seen in chronic alcohol abuse)

**Methylprednisolone**

(solu-medrol)

**GCEMS Protocol:**

Anaphylactic/Allergic Reaction  
Pediatric Anaphylactic/Allergic Reaction  
Reactive Airway Disease

**Indications:**

- Moderate to severe exacerbation of reactive airway disease
- Allergic reactions

**Contraindications:**

- known hypersensitivity

**Side Effects:**

- depression
- gastrointestinal bleeding
- prolonged wound healing
- Suppression of natural steroids
- Arrhythmias

- 125 mg IV/IO

- 2 mg/kg IV/IO; maximum 125 mg

**Midazolam**

(Versed)

**GCEMS Protocol:**

Multiple

**Indications:**

- Major motor seizures
- Status epilepticus
- Acute anxiety states
- Skeletal muscle relaxant
- MFI/RSI & Post intubation sedation
- Dystonic Reactions

**Contraindications:**

- Respiratory depression
- Hypotension
- ETOH
- Pregnancy

**Side Effects:**

Apnea, cardiac arrhythmias, hypotension

**MFI/RSI Etomidate Alternative:**

- 0.1 mg/kg IV/IO; max dose 8 mg.

**Post Airway Sedation:**

- 5 mg IV/IO may repeat once in 5-10 mins max 10 mg.

**Seizures:**

- 10 mg IM or 2.5-5 mg IV mg

**Chemical Restraint:**

- 2.5 mg IV or 5 mg IM

**Sedation/Anxiety:**

- 1 mg IV repeat once in 2 minutes.
- 5 mg IM, if no IV or IO.

**Seizures:**

- 0.1 mg/kg IM, maximum 5 mg



**Morphine Sulfate****GCEMS Protocol:**

Multiple

**Indications:**

- AMI
- Severe pain in selective situations

**Contraindications:**

- Head injury
- Hypotension
- Asthma
- Respiratory depression
- Undiagnosed abdominal pain

**Side Effects:**

Respiratory depression, hypotension, bradycardia, nausea/vomiting

- Initial dose 0.1 mg/kg slow IV/IO/IM; maximum 5 mg single dose
- May repeat once to a max of 10 mg
- Further doses require Medical Control order

- 0.1 mg/kg slow IV/IO/IM; maximum single dose 5 mg
- \*\*Direct Medical Control Order for ages <5 years old\*\*

**Naloxone**

(Narcan)

**GCEMS Protocol:**

Poisoning/OD (Adult &amp; Pediatric)

**Indications:**

- Narcotic Overdoses
- Synthetic analgesic overdoses

**Contraindications:**

- Known hypersensitivity

**Side Effects:**

Vomiting with rapid administration, ventricular dysrhythmias, precipitate acute narcotic withdrawal syndrome, seizures, hypertension.

- 1-2 mg slow IV/IO/IM titrated to respirations; max 4 mg
- 4 mg IN, may repeat once.

- 0.1 mg/kg max 2 mg; may repeat every 2-3 minutes as needed
- 4 mg IN, may repeat once.

**Nitroglycerin**

(Nitro/Nitrostat/Nitro-Bid)

**GCEMS Protocol:**

Acute Coronary Syndrome Hypertensive Crisis

CHF/Pulmonary Edema

**Indications:**

- Chest pain consistent with acute coronary symptoms
- Pulmonary Edema

**Contraindications:**

- increased Intracranial Pressure (ICP)
- Hypotension/Shock
- Glaucoma
- Use of some erectile dysfunction medications within the last 36 hours

**Side Effects**

Headache, dizziness, hypotension

**Spray:**

- 0.4 mg/metered dose, Spray 1 or 2 metered doses directly on the mucosa under the tongue; may repeat every 5 minutes while symptoms persist.

**Sublingual:**

- Tablet 0.3-0.4 mg; may repeat every 5 minutes while symptoms persist.

**Ointment Paste:**

- Apply in ½" 1" thin layer to patient's skin by means of dose measured applicator supplied with tube.

Not Approved

**Nitrous Oxide**

(Nitronox)

**GCEMS Protocol:**

adult and pediatric Pain Management

**Indications:**

- Pain of musculoskeletal origin, particularly fractures and burns
- suspected ischemic chest pain

**Contraindications:**

- Patients who cannot comprehend verbal instructions
- altered mental status
- suspected pneumothorax
- abd pain and distension suggestive of bowel obstruction

**Side Effects:**

headache, dizziness, giddiness, nausea/vomiting,

- self-administered only using fixed 50% nitrous oxide and 50% oxygen blender

- over the age of 5 years old: self-administered only using fixed 50% nitrous oxide and 50% oxygen blender

**Oxytocin**

(Pitocin)

**GCEMS Protocol:**

Obstetrical Emergencies

**Indications:**

- Post Partum Hemorrhage

**Contraindications:**

- Presence of a second fetus
- Previous cesarean section

**Side Effects:**

Uterine rupture, anaphylaxis, dysrhythmias, nausea/vomiting, hypertension

- 20 units in 1000 mL or Normal Saline; slow IV infusion titrated according to severity of bleeding and uterine response; in postpartum females only

Not Approved

- Given only after baby and placenta are delivered
- Overdose can cause uterine rupture
- Vital signs and uterine tone should be monitored constantly
- Do not give to patients taking vasopressors

**Piperacillin/Tazobactam**

(Zosyn)

**GCEMS Protocol:**

Sepsis

**Indication:**

- SIRS criteria x2 and known or suspected source of infections other than pulmonary

**Contraindications:**

- Allergy to Zosyn, Penicillin or their derivatives

**Side Effects:**

None in the prehospital setting

- 3.375 G (or 4.5 G) mixed in 50 mL or 100 mL of NS infused IV/IO over 10 minutes

Not Approved

## Drugs

## Adult

## Pediatric

### **Pralidoxime**

(Protopam)

#### **GCEMS Protocol:**

WMD – Nerve Agents

#### **Indications:**

- Treatment of muscle weakness and/or respiratory depression secondary to poisoning due to nerve agents

#### **Contraindications:**

- Known Hypersensitivity

#### **Side Effects:**

Dizziness, headache, drowsiness, nausea, tachycardia, increased blood pressure, hyperventilation, muscular weakness

- 1,000-2,000 mg; followed by 25 mg every 5 minutes as needed

- 20-50 mg/kg; maximum 2,000 mg

### **Racemic Epinephrine**

(MicroNEFIN, Vaponephrine)

#### **GCEMS Protocol:**

Pediatric Reactive Airway Disease

#### **Indications:**

- Croup (Laryngotracheobronchitis)

#### **Contraindications:**

- Should not be used in management of epiglottitis

#### **Side Effects:**

Can result in tachycardia and possible arrhythmias

Not Approved

- 0.5 mL (diluted to 3 mL with Normal Saline) nebulized; may not repeat.
- Physician in the receiving ED should be notified that treatment has been administered.

### **Sodium Bicarbonate**

(NaHCO<sub>3</sub>)

#### **GCEMS Protocol:**

Multiple

#### **Indications:**

- Severe Metabolic acidosis
- Cardiac Arrest (after ventilation problems are corrected)
- certain medication Overdoses
- Hyperkalemia

#### **Contraindications:**

- CHF
- Hypokalemia

#### **Side Effects:**

Metabolic alkalosis, increased vascular volume, pulmonary edema, dysrhythmias through serum potassium depletion, transiently raises the arterial PCO<sub>2</sub>

- 1 mEq/kg IV/IO; may repeat 0.5 mEq/kg every 10 minutes.

- 1 mEq/kg IV/IO
- Age <2 years: Must be diluted 1:1 with D5W or Normal Saline prior to administration.

## Drugs

## Adult

## Pediatric

### Sodium Chloride 0.9%

(Normal Saline)

#### GCEMS Protocol:

Multiple

#### Indications:

- Need for fluid resuscitation
- Used as delivery agent for infusions

#### Contraindications:

- Congestive heart failure hypersensitivity

#### Side Effects:

Volume overload, congestive heart failure, diuresis, thirst

- IV/IO dependent upon patient condition and situation being treated

- IV/IO dependent upon patient condition and situation being treated

### Succinylcholine

(Anectine)

#### GCEMS Protocol:

Rapid Sequence Induction (RSI)

#### Indications:

- Facilitate endotracheal intubation by paralysis
- Facilitate management of patients undergoing mechanical ventilation

#### Contraindications:

- Known hypersensitivity
- History of malignant hyperthermia
- Skeletal muscle myopathies
- Penetrating eye injury

#### Side Effects:

Apnea, cardiac arrhythmias, increased intraocular pressure, muscle fasciculation

- 1.5 mg/kg over 30 seconds; maximum 150 mg

Not Approved

- Succinylcholine has not effect on consciousness, pain threshold, or cerebration; must be used only with adequate sedation.
- In elderly, time of onset may be delayed due to slower circulation time in cardiovascular disease.
- Use with caution in patients with severe burns, electrolyte imbalance, hyperkalemia, and those receiving Quinidine or Digitalis.

### Terbutaline

(Brethine)

#### GCEMS Protocol:

Reactive airway disease

#### Indications:

- Bronchial asthma
- Reversible bronchospasm associated with chronic obstructive pulmonary disease

#### Contraindications

- Patients with known hypersensitivity to the medication
- A-fib RVR

#### Side Effects:

- Tachyarrhythmias

- 0.25mg SQ may be repeated once after 20 minutes

- 0.01mg/kg, not to exceed 0.25mg may repeat once after 20 minutes

**Tetracaine**

(Ophthalmic drops)

**GCEMS Protocol:**

Eye Injuries/Complaints

**Indications:**

- Anesthetic to the eye

**Contraindications:**

- No more than 2 dosing per eye

**Side Effects:**

Lacrimation

- 2 drops in the effected eye(s)

Not Approved

**Toradol**

(Ketorolac)

**GCEMS Protocol:**

Adult\ Ped Pain Management

**Indications:**

- Severe pain in selective situations

**Contraindications:**

- Known hypersensitivity
- patients with advanced renal impairment and in patients at risk for renal failure due to volume depletion.

**Side Effects:**

No side effects have occurred except with overdoses

**Pharmacokinetics**

- Onset of action IV/IM 15-30min
- Peak effect 2-3 hours

- 15 mg IV\ 30 mg IM,

- **2 years of age or older only**  
0.5 mg\kg, max of 15 mg IV\30 mg IM

**Tranexamic Acid (TXA)**

(Cyklokapron)

**GCEMS Protocol:**

- Traumatic Hypovolemic Shock
- Isolated Angioedema

**Indications:**

- Adult patient > 18 years of age who present with traumatic, life-threatening, non-compressible hemorrhage
- Adult patient with isolated Angioedema

**Contraindications:**

Time of injury is >3 hours prior  
Active within the last 24 hours thromboembolic event  
Traumatic arrest >5 minutes  
Penetrating Cranial Injury or TBI with exposed brain matter  
Cervical cord injuries with motor deficits

**Side Effects:**

Hypotension, seizures, visual disturbances

**Traumatic Hypovolemic Shock:**

- 2 Grams mixed into 50 or 100 mL NS over 10 minutes IV/IO

**Isolated Angioedema:**

- 1 Gram mixed into 50 or 100 mL NS over 10 minutes IV/IO

Not Approved

# Drugs

# Adult

# Pediatric

## Vecuronium

(Norcuron)

### GCEMS Protocol:

Post Airway Management

### Indications:

- Continued agitation after post airway sedation.

### Contraindications:

- Known hypersensitivity

### Side Effects:

Prolonged paralysis, hypotension, bradycardia

- 0.1 mg/kg; Max 10 mg IV/IO

Not Approved

## Zemuron

(Rocuronium)

### GCEMS Protocol:

Airway RSI/DSI

Post Airway

### Indications:

- Facilitate endotracheal intubation by paralysis
- Facilitate management of patients undergoing mechanical ventilation

### Contraindications:

- Use caution in patients with known significant hepatic disease, pulmonary hypertension, and valvular heart disease

### Side Effects:

- Hypersensitivity

- 1 mg/kg IV/IO; max 100 mg bolus \*\*\*See dosing chart\*\*\*

Not Approved

## Zofran

(Ondansetron)

### GCEMS Protocol:

Multiple

### Indications:

- Nausea/Vomiting

### Contraindications:

- None

### Side Effects:

Extra-pyramidal reaction (rare)

- 4 mg slow IV/IM (over 2 minutes); may repeat once to a maximum of 8 mg
- 4mg ODT

### 8-15 kg:

- 2mg slow (over 2 minutes) IV, or IM

### >16 kg:

- 4 mg slow (over 2 minutes) IV, or IM

**ODT** Zofran (Ondansetron) 4 mg can be given to a previously healthy child > 6 months of age.