Greenville County
Emergency Medical Services

Clinical Operating Guidelines

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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

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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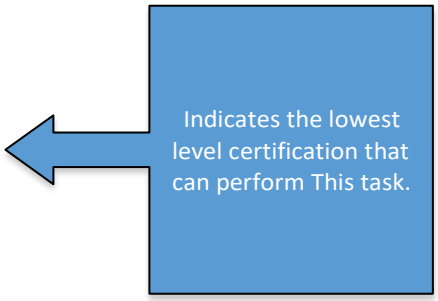


Air Transport

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

1.4

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.

Standard Policies

DNR, POST, and Advanced Directives

1.5

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:
  - A. 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.
  - B. The effective date and all required information provided
  - C. 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:
  - a. Full Treatment box is checked: Use all appropriate measures included in Greenville County EMS system protocols to stabilize/resuscitate the patient.
  - b. 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.
  - c. 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 tachcardia 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 $EtCO_2 \geq 10mmHg \pm$ 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 $EtCO_2 < 10mmHg$, consider termination after 20 minutes.
  - If $EtCO_2 \geq 10mmHg$, 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

1.7

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.

Deceased Person

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).

Firefighter Rehabilitation

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 than101.
        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 encourage automatically for the following:
    a. Chest pain.
    b. Shortness of breath unresolved by 10 minutes of high flow O_2.
    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

Infant Abandonment

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 ***unharmed*** 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:

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

    a. 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.

7. 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

1.12

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.

Police Custody

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.

Trauma Activations

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	
M = Mechanism of Injury	• Blunt • Penetrating • Burn • Entrapment duration (PRN)
I = Injuries Sustained (AIRWAY)	• Injuries identified or suspected
S = Vital Signs and GCS	• Current VS and O2 sat • Lowest BP • GCS • Pupils
T = Treatment (What did EMS do?)	• IV’s – location/size • Fluids/Blood – type and volume infused • Procedures (include meds)

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 treament.

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> 5 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 = Heart rate divided by systolic blood pressure)
        iv. Pediatric patients > 5 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 Prisma Health and report back details of response and an ETA.
2. Continue tour assessment and treatment of the patient until the responding Prisma Health Ambulance Service 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 Prisma Health Ambulance Service arrival, they may intercept prior to hospital arrival.

Requesting Blood Products (continued)

Patient Preparation:

Criteria:

- GCEMS personnel will follow departmental guidlines 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
  - 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 Prisma Health paramedic will be responsible for transfusion administration and related reactions should they occur. The expectation is that our organization will work together as a team to provide quality patient care.

Refusals

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.

Standard Procedure (Skill)

Airway: Apneic Oxygenation

2.1

Clinical Indications:

- Pre-oxygenation of the RSI, DSI, 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_2O 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

Standard Procedure (Skill)

Airway: BIAD IGEL

2.2

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_2 detector**.
11. Waveform capnography must be utilized immediately upon its availablity.
12. The airway must be monitored continuously through waveform capnography and pulse oximetry.
13. Complete an airway evaluation form and obtain confirmation signture 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

Standard Procedure (Skill)

Airway: CPAP

2.3

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_2O. 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_20. Use the lowest possible setting to avoid barotrauma.
8. For apneic oxygenation set the PEEP at 5 cm H_20.
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_2 (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

Standard Procedure (Skill)

Airway: Endotracheal Tube Introducer (Bougie)

2.4

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 90º 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_2 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

Standard Procedure (Skill)

Airway: Foreign Body Obstruction

2.5

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

Standard Procedure (Skill)

Airway: Intubation Nasotracheal

2.6

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

Standard Procedure (Skill)

Airway: Intubation Oral Tracheal

2.7

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 to10 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, $EtCO_2$ should be greater than 10 or comparable to pre-intubation values. If less than 10, check for adequate circulation, equipment, and ventilatory rate. If $EtCO_2$ 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 EtCO2 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

Standard Procedure (Skill)

Airway: Tracheostomy Tube Change

2.9

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 difficultly 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 tracheotomy 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

Standard Procedure (Skill)

Airway/Breathing: Capnography

2.10

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 $EtCO_2$ accessory for the patient.
2. Open the CO_2 port door and insert the FilterLine connector; turn connector clockwise until tight.
3. Verify that the CO_2 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_2 FilterLine set to the patient via BIAD, endotracheal tube, or oxygen delivery device.
6. Confirm that the $EtCO_2$ 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_2 waveform appears when any CO_2 is detected, but CO_2 must be greater than 3.5 mmHg for a numerical value to be displayed. However, the CO_2 module will not recognize a breath until the CO_2 is at least 8 mmHg.
8. Note CO_2 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_2 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

Standard Procedure (Skill)
Airway/Breathing: Nebulizer Inhalation Therapy

2.11

Clinical Indications:

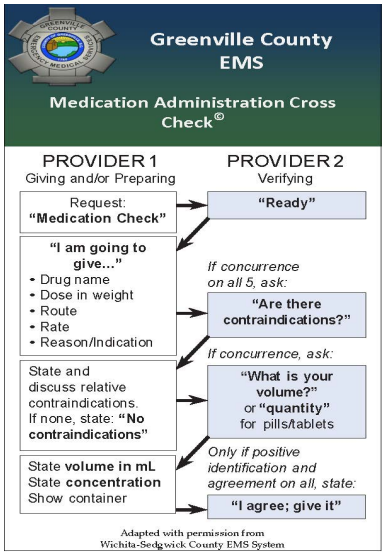
- Patients experiencing bronchospasm.

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 is 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

Standard Procedure (Skill)

Assessment: Pain and Documentation

2.12

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:

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self-report.
2. 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.
3. Pain should be assessed using the appropriate approved scale.
4. Three pain scales are available: the 0-10, the Wong - Baker "faces", and the FLACC.
   a. 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.
   b. 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.
   c. 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
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, uninterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting, back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

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

2.13

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 O**xygen** 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

Standard Procedure (Skill)

Cardiac: 12 lead Placement

2.14

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: 4th intercostal space at right sternal border
   f. V2: 4th intercostal space at left sternal border
   g. V3: Directly between V2 and V4
   h. V4: 5th 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 5th 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.

Standard Procedure (Skill)

Cardiac: External Pacing/Synchronized Cardioversion

2.15

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 (usally 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.

P	Paramedic

Standard Procedure (Skill)

Treatment: Child Birth

2.16

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

Standard Procedure (Skill)

Treatment: Decontamination

2.17

Clinical Indications:

- Any patient who may have been exposed to significant hazardous materials, including chemical, biological, or radiological weapons.

Procedure:

1. In coordination with HazMat and other emergency management personnel, establish hot, warm and cold zones of operation.
2. Ensure that personnel assigned to operate within each zone have proper personal protective equipment.
3. 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:
    a. Removal of patients from hot zone.
    b. Simple removal of clothing.
    c. Irrigation of eyes.
    d. 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).
4. Initial triage of patients should occur after step 3. Immediate life threats should be addressed prior to technical decontamination.
5. 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.
6. 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.
7. Monitor all patients for environmental illness.
8. 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

Standard Procedure (Skill)

Treatment: Pleural Decompression

2.18

Clinical Indications:

- To relieve tension pneumonthorax.
  - 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

AND

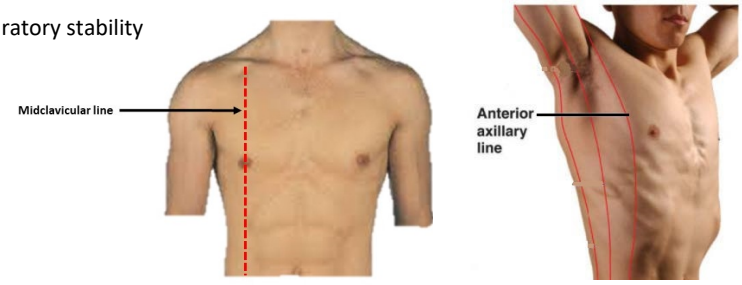
- Evidence of tension physiology
  - **Signs and Symptoms of Clinical Deterioration:** Decreasing blood pressure, increased work of breathing, restlessness, worsening skin color, pallor, diaphoresis, expanding crepitus.

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 ETCO2.
- 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

Standard Procedure (Skill)

Treatment: Subcutaneous & Intramuscular

2.19

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.

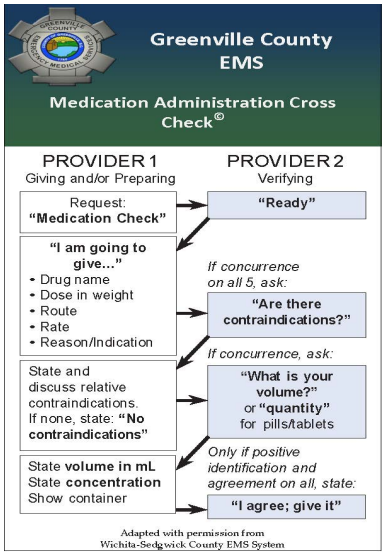
Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication expelling air from the syringe.
3. Explain the procedure to the patient and reconfirm patient allergies.
4. The most common site for SQ injection is the arm.
    a. Injection volume should not exceed 1 mL.
5. The possible injection sites for IM injections include the arm, buttock and thigh.
    a. Injection volume should not exceed 1 mL for the arm.
    b. Injection volume should not exceed 5 mL in the thigh or buttock. Multiple sites may be necessary in cases of **Magnesium Sulfate** administration.
    c. EMT can only administer IM Epinephrine injection when Auto-Injector is not available.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 mL.
7. Expose the selected area and cleanse the injection site with alcohol.
8. Insert the needle into the skin with a smooth, steady motion.

    SQ: 45º angle, skin pinched **IM: 90º angle, skin flattened**
9. Aspirate for blood.
10. Inject the medication.
11. Withdraw the needle quickly and dispose of properly without recapping.
12. Apply pressure to the site.
13. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
14. 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

Standard Procedure (Skill)

Venous Access: Existing Catheters

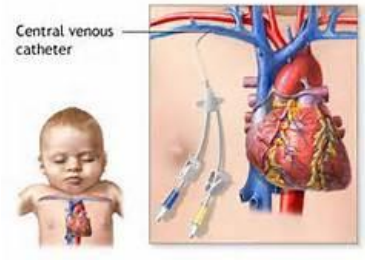
2.20

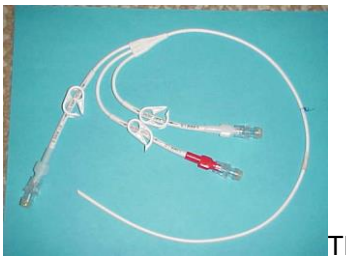
Clinical Indications:

- 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.

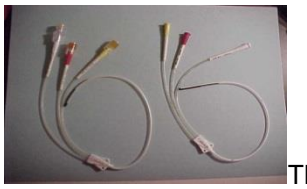
Procedure:

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).

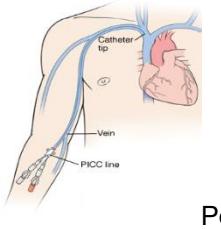




The Broviac® catheter and the Hickman® catheter are temporary IV lines placed into a vein in the chest. The Broviac® is smaller than the Hickman® and therefore used for pediatric patients. These catheters are soft and come in double and triple lumens (as shown above).



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.

Standard Procedure (Skill)

Venous Access: External Jugular

2.21

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

Standard Procedure (Skill)

Venous Access: Extremity

2.22

Clinical Indications:

- Any patient where intravenous (IV) access is indicated (significant trauma or mechanism, emergent or potentially emergent medical condition).

Procedure:

1. Saline locks may be used as an alternative to an IV tubing and IV fluid in every protocol at the discretion of the provider.
2. May use intraosseous (IO), External jugular (EJ), or preexisting venous catheter where threat to life exists and no obvious peripheral site is noted.
3. Use the largest catheter bore necessary based upon the patient's condition and size of veins.
4. Fluid and setup choice is preferably:
   a. **Normal Saline** with a macro drip (10 gtt/mL) for trauma or hypovolemia.
   b. **Normal Saline** with a macro drip (10 gtt/mL) for medical conditions, and
   c. **Normal Saline** with a micro drip (60 gtt/mL) for medication infusions.
5. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
6. 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.
7. Place a tourniquet around the patient's extremity to restrict venous flow only.
8. Upper extremity IV sites are preferable to lower extremity sites.
9. Lower extremity IV sites are discouraged in patients with vascular disease or diabetes.
10. In post-mastectomy patients, avoid IV, blood draw, injection, or blood pressure in arm on affected side.
11. Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
12. Prep the skin with an antiseptic solution.
13. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the bloody flashback is visualized in the catheter.
14. Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
15. Remove the tourniquet and connect the IV tubing or saline lock.
16. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.
17. All IV rates should be at KVO (minimal rate to keep vein open) unless administering fluid bolus.
18. Consider a second IV line.
19. Cover the site and secure the IV and tubing.
20. 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

Standard Procedure (Skill)

Venous Access: Intraosseus (Adult)

2.23

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:

1. Proximal humerus (preferred site, > 12 years of age)
   a. 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.
   b. Use your thumb to identify humeral shaft, slide thumb towards humeral head with firm pressure. Locate tubercule by prominent bulge.
   c. 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.
   d. With your finger on the insertion site, keeping the arm adducted, externally rotate the humerus 90º. You may be able to feel the inter-tubercular groove.
   e. Rotate the arm back to the original position for insertion. The insertion site is 1-2 cm lateral to the inter-tubercular groove.
2. Proximal tibia
   a. Identify the tibial tuberosity located 2 finger-breaths below the base of the patella.
   b. The insertion site is 1-2 cm medical 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:

1. Cleanse site using antiseptic agent and allow to air dry thoroughly.
2. Prime the EZ-Connect extension set with approximately 1ml NS.
3. Connect appropriate needle set to driver and stabilize site.
4. Remove needle cap and position the driver at the insertion site with the needle set at a 90º angle to the bone surface.
5. Gently pierce the skin with the needle tip until the tip touches the bone.
6. The 5 mm mark must be visible above the skin for confirmation of adequate needle length.
7. Gently drill into the bone and stop at loss of resistance.
   a. Stop when you feel the "pop" or "give" in infants.
8. 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.
   a. The needle should feel firmly seated in the bone (1st confirmation of placement).
9. 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.
10. Flush the catheter with **5-10 mL Normal Saline** adults (**2-3 mL** pediatric)**;** look for infiltration (2nd confirmation of placement).
    a. 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.
11. Begin infusion utilizing a pressure delivery system and continue to monitor extremity for complications.
12. Any prehospital fluids or medications approved for intravenous (IV) use may be given IO.
13. 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

Standard Procedure (Skill)

Venous Access: Intraosseus (Pediatric, <12)

2.24

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:

1. Proximal tibia (<12 years of age)
   a. Identify the tibial tuberosity located 2 finger-breaths below the base of the patella.
   b. 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.
2. Distal femur (<12 years of age)
   a. Secure site with leg outstretched to ensure knee does not bend.
   b. 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).
   c. Aim the needle set tip at a 90-degree angle to the bone for insertion.

Procedure:

1. Cleanse site using antiseptic agent and allow to air dry thoroughly.
2. Prime the EZ-Connect extension set with approximately 1ml NS.
3. Connect appropriate needle set to driver and stabilize site.
4. Remove needle cap and position the driver at the insertion site with the needle set at a 90º angle to the bone surface.
5. Gently pierce the skin with the needle tip until the tip touches the bone.
6. The 5 mm mark must be visible above the skin for confirmation of adequate needle length.
7. Gently drill into the bone and stop at loss of resistance.
   a. Stop when you feel the “pop” or “give” in infants.
8. 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.
   a. The needle should feel firmly seated in the bone (1st confirmation of placement).
9. 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.
10. Flush the catheter with **2-3 mL Normal Saline** adults**;** look for infiltration (2nd confirmation of placement).
    a. 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.
11. Begin infusion utilizing a pressure delivery system and continue to monitor extremity for complications.
12. Any prehospital fluids or medications approved for intravenous (IV) use may be given IO.
13. 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

Standard Procedure (Skill)

Wound Care: Tazer Probe Removal

2.25

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)

2.26

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. For the upper extremity, the band should be passed through the inside buckle, closest to the fabric, and then pull the band tight. If you place it through the outside slit, away from the fabric, you add a small amount of distance between the band and the buckle that could increase the “pinch” feel. The CAT® is delivered in the one-handed configuration with the band through the slit, and is the recommended storage configuration. For lower extremity, pass the band through the slit.
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

2.27

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

Standard Procedure (Skill)

Pain Management: Nitrous Oxide

2.28

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

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 indequate ventilation in a patient equal to or greater than 12 years old.

Procedure: Control-Cric™

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™, 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™ 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™ 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™, or lack of tactile feedback from the tracheal rings suggests incorrect placement.
9. Once placement has been confirmed, advance the Cric-Key™ to the flange. Stabilize the Cric-Key™ tube and pivot the tracheal hook toward the patient's shoulder to remove from the airway.
10. While stabilizing the Cric-Key™ tube, remove the Cric-Key™ 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 $EtCO_2$ 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 parient 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 PERFROM 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. ssessment of this knowledge may be accomplished via quality assurance mechanisms, classroom demonstrations, skills stations, or other mechanisms as deemed appropriate by Medical Control.

SO	Special Operations

Wound Care: Eye Irrigation

Clinical Indications:

- Irrigation for eye injuries prior to and during transport.

Irrigation Guidelines and Procedures:

1. 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**.
2. To utilize the Morgan Lens®, follow these steps:
    a. Apply topical ocular anesthetic (e.g., 2 drops **Tetracaine**).
    b. Attach Morgan Lens® set to IV tubing to sterile solution (e.g., saline bag); START FLOW.
    c. Have patient look down, retract upper lid, and insert Morgan Lens® under upper lid.
    d. Have patient look up, retract lower lid, and then gently drop lens in place.
    e. 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.
    f. 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.
3. 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

Universal Patient Care Protocol

- Scene safety
- Bring all necessary equipment to patient's side
- Demonstrate professionalism and courtesy
- PPE (consider airborne and droplet if indicated)
- Initial assessment
- BLS maneuvers
- Initiate **Oxygen** if indicated

Minimum Equipment
- ✓ ALS bag
- ✓ Heart monitor or AED
- ✓ Oxygen Caddy

See appropriate protocol

F	Vital signs (temperature if appropriate)
	Pulse oximetry
	Consider supplemental **Oxygen**
B	Consider glucose measurement
	Consider 12-Lead EKG
	Consider cardiac monitor

LVAD or TAH?

- ✓ Identify Device Type
- ✓ Contact Emergency VAD Line for device
- ✓ Consult EMS VAD Emergency Field Guide for guidance
- ✓ Ensure device is properly connected
- ✓ Assess device for alarms
- ✓ Intervene appropriately based on the alarm type and guidance provided
- ✓ Bring all equipment with patient

Glucose <60 with signs of hypoglycemia

See: AMS/Diabetic Emergency protocol

See appropriate protocol

M	Patient does not fit a protocol

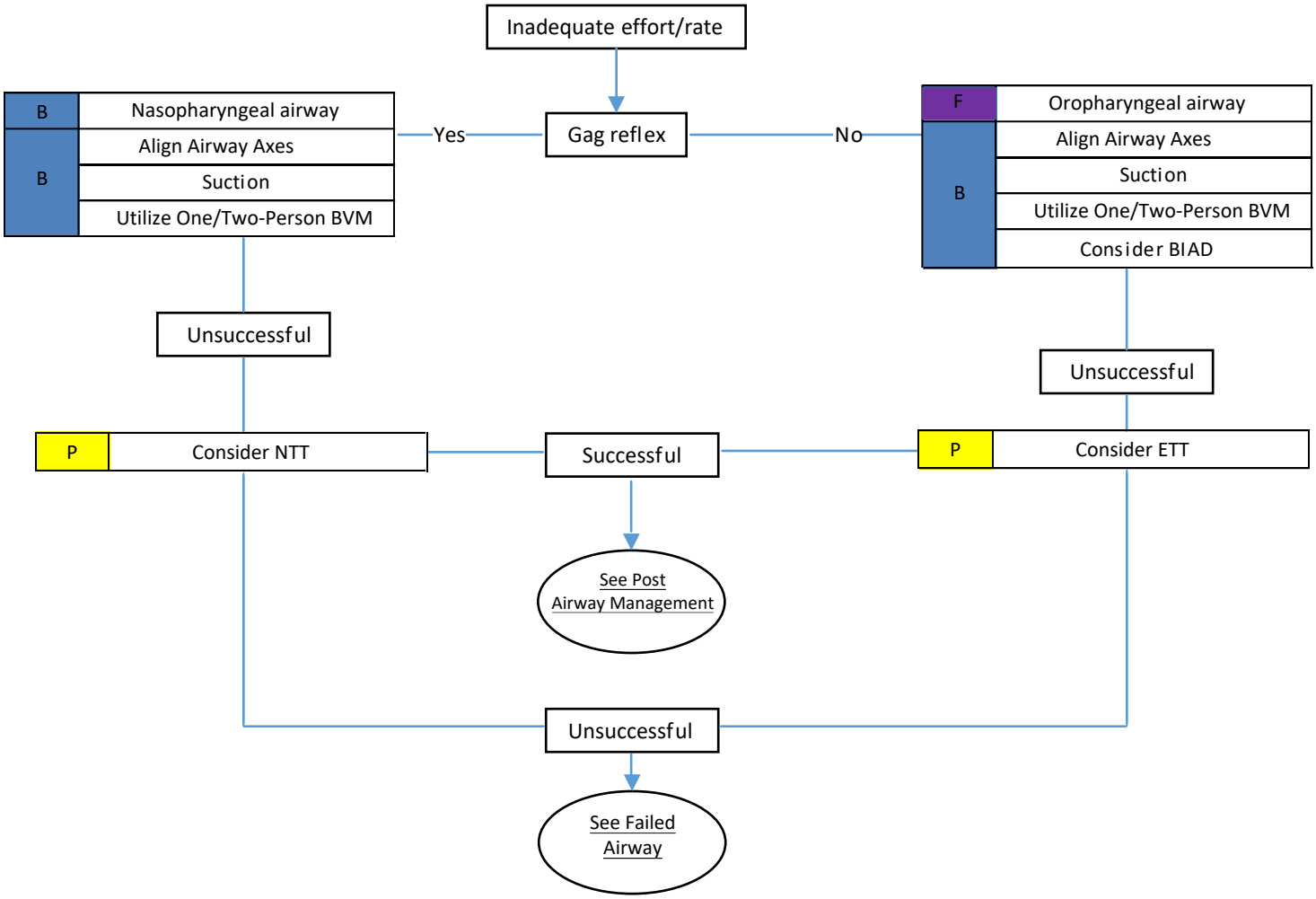
Patient Definition: A patient is defined as any person who meets any of the following criteria:

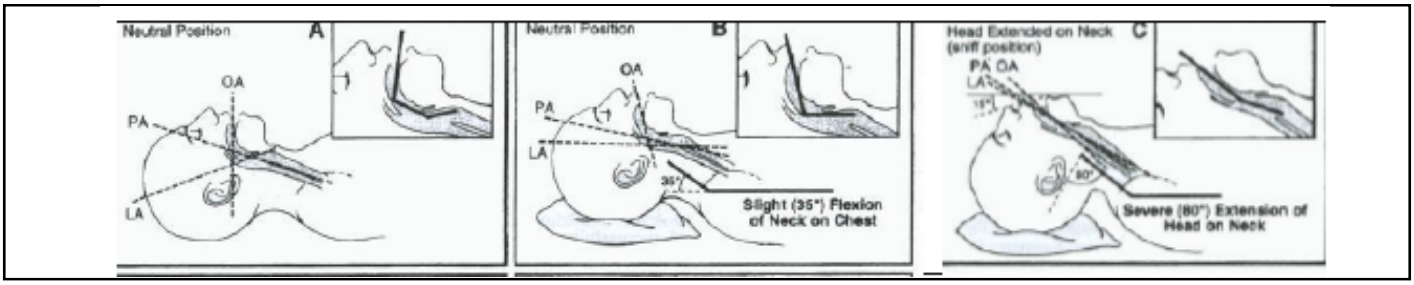
- Receives basic or advanced medical/trauma treatment
- Is physically examined
- Has visible signs of injury or illness or has a medical complaint
- Requires EMS assistance to change locations and/or position
- Identified by anyone as a possible patient because of some known, or reasonably suspected 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.

Adult: Universal Airway





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 EtCO2 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 EtCO2 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 H2O. Consider increasing PEEP to 10 cm H2O, if SPO2 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

Indications:

- **Age 12 or greater**
- Trauma with GCS ≤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:

- **R**estricted opening
- **O**bstruction
- **D**istorted airway
- **S**tiff 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

B	Reference RSI Check Sheet
	Initiate apneic oxygenation
	If feasible, position patient with head elevated at 20° - 45° angle
B	Monitor O_2 sat with pulse oximetry
A	Ensure functioning IV access
P	Prepare Equipment For Intubation, Manage Hypotension
P	Monitor heart rhythm with EKG
P	**Etomidate IV/IO or Ketamine** 2 **mg/kg IV/IO max dose 200 mg ;** see dosing chart
	If no **Etomidate,** give **(Midazolam) Versed 0.1 mg/kg IV/IO; max dose 8 mg**
B	Continue apneic oxygenation with **15 LPM Oxygen via nasal cannula** under BVM/CPAP to achieve SPO2 of ≥ 93%

RSI →

RSI-P	Administer **Succinylcholine (Anectine) IV/IO; max 150 mg**

Or

RSI-P	Administer **Rocuronium (Zemuron) IV/IO; max 100 mg**

MFI

P	Intubate trachea

Successful

Direct visualization of ETT through vocal cords
Continuous wave-form capnography
Assess lung and epigastric sounds

See: Post Airway Management

P	Intubate trachea

Unsuccessful

See: Failed Airway Protocol

Notify receiving facility or contact Medical Control

Airway

Adult Airway: MFI/RSI

Ketamine Dosing

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

Use in patients with hypotension and reactive airway disease.

Etomidate Dosing Chart

Weight		Dose	Volume
Under 100 lbs	< 45 kg	15 mg	7.5 mL
100-200 lbs	45-91 kg	20 mg	10 mL
Over 200 lbs	> 91 kg	30 mg	15 mL

Use in patients with significant hypertension.

Succinycholine Dosing Chart

Weight		Dose	Volume
Under 100 lbs	< 45 kg	75 mg	3.75 mL
100-200 lbs	45-91 kg	150 mg	7.5 mL
Over 200 lbs	> 91 kg	150 mg	7.5 mL

Review contraindications in PEARLS

Rocuronium Dosing Chart

100 mg/10 mL vial

Weight		Dose	Volume
Under 100 lbs	< 45 kg	50 mg	5 mL
100-200 lbs	45-91 kg	100 mg	10 mL
Over 200 lbs	> 91 kg	100 mg	10 mL

Airway

PEARLS:

- 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_2 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 larynogspasm 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 ≤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:

- **R**estricted opening
- **O**bstruction
- **D**istorted airway
- **S**tiff 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

B — Reference DSI Check Sheet

B — Initiate apneic oxygenation

B — If feasible, position patient with head elevated at 20° - 45° angle

B — Monitor O_2 sat with pulse oximetry

A — Ensure functioning IV access

P — Prepare Equipment For Intubation, **Manage Hypotension** (SBP > 90mmHg)

P — Monitor heart rhythm with EKG

P — **Ketamine** 2 **mg/kg slow push IV/IO max dose 200 mg ;** see dosing chart

If no **Ketamine or Ketamine contraindicated, see COG 5.2 A to follow MFI/RSI procedure**

NOTE:
If dangerously combative, give **4 mg/kg Ketamine IM;** max single dose 400 mg for induction.

B — Consider cricoid pressure, continue apneic oxygenation for **3 minutes** with **15 LPM Oxygen via nasal cannula** under BVM/CPAP to achieve SPO2 of ≥ 93%.

DSI → RSI-P — Administer **Rocuronium (Zemuron) IV/IO; max 100 mg**

MFI

P — Intubate trachea

P — Intubate trachea

Successful

Direct visualization of ETT through vocal cords
Continuous wave-form capnography
Assess lung and epigastric sounds

See: Post Airway Management

Unsuccessful

See: Failed Airway Protocol

Notify receiving facility or contact Medical Control

Airway

Adult Airway: MFI/DSI

Ketamine Dosing

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

Rocuronium Dosing Chart

100 mg/10 mL vial

Weight		Dose	Volume
Under 100 lbs	< 45 kg	50 mg	5 mL
100-200 lbs	45-91 kg	100 mg	10 mL
Over 200 lbs	> 91 kg	100 mg	10 mL

PEARLS:

- 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_2 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 larynogspasm 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).**

Post Airway Management

Successful ETT, Nasal intubation, or Supraglottic Airway device

P	Verify tube placement through auscultation, continuous capnography and pulse oximetry
B	Secure tube

P	Manage Hypotension

P	Provide sedation as needed
	Ketamine 2 mg/kg IV/IO bolus max single dose 200 mg; may repeat once after 10 minutes.

OR

P	**Midazolam (Versed)** 5 mg IV/IO; q 5-10 min max 10 mg
	Consider analgesia, see 8.11 Pain Management for **Fentanyl**

P	If dysynchronous with mechanical ventilation in spite of adequate sedation, consider **Vecuronium (Norcuron)** 0.1 mg/kg to a max dose of 10 mg.

Notify receiving facility or contact Medical Control

PEARLS:

- **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 **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..

Adult: Failed Airway

Upon first attempt failure, reinitiate ventilations via BVM and continue apneic oxygenation. Manage pharmacology induced hypotension. This step must be performed between each attempt.

↓

An SPO2 ≥ 93% must be achieved prior to any additional attempts. If unable to achieve, continue ventilations via BVM. Consider placing BIAD.

↓

Second attempt- consider switching to another qualified provider, changing technique.

↓

Third attempt- If not already done, you must change provider and technique.

↓

After maximum of three attempts, airway must be maintained with BVM or BIAD.

↓

Initiate emergent transport to the closest appropriate facility.

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.

Acute Coronary Syndromes

History:
- Age ≥18
- Past medical history
  - MI
  - Angina
  - Diabetes
  - Post menopausal
- Medications
- **Erectile dysfunction medications**
- Recent physical exertion
- **P**alliation/**P**rovocation
- **Q**uality (crampy, constant, sharp, dull, etc.)
- **R**egion/**R**adiation/**R**eferred
- **S**everity (1-10)
- **T**ime (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_2 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)**
P	Consider **Nitroglycerin Paste 1 gram/1 inch**
	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 100 mcg.

Positive acute MI (STEMI = 1mm ST segment elevation)

No → Notify receiving facility or contact Medical Control

Yes →

B	Transport with early notification: **scene time <15 min**
A	Consider **Normal Saline up to 1,000 mL** for inferior MI's/hypotension
	Consider 2nd IV en-route
P	If **responsive and alert give Heparin 5,000 units IV**
M	If **unresponsive, contact MC prior to Heparin 5,000 units IV administration**

Notify receiving facility or contact Medical Control and give full oral report including updates since 12-Lead transmission

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_2 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.

Bradycardia

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

HR <60 with signs or symptoms of poor perfusion caused by the bradycardia
(e.g. acute AMS, syncope, ongoing chest pain, SOB, hypotension, acute CHF, seizure, or other signs of shock

No → Continue to monitor and

Yes →

P	**Atropine 1 mg IV/IO** may repeat every 3-5 min**; max dose 3 mg**

Improving?

No →

P	Transcutaneous pacing Consider conscious sedation Consider **Epinephrine Drip** 2 – 10 mcg / min IV / IO Or Consider **Dopamine 5-20 mcg/kg/min IV/IO**

Yes →

Notify receiving facility or contact Medical Control

Adult Cardiac

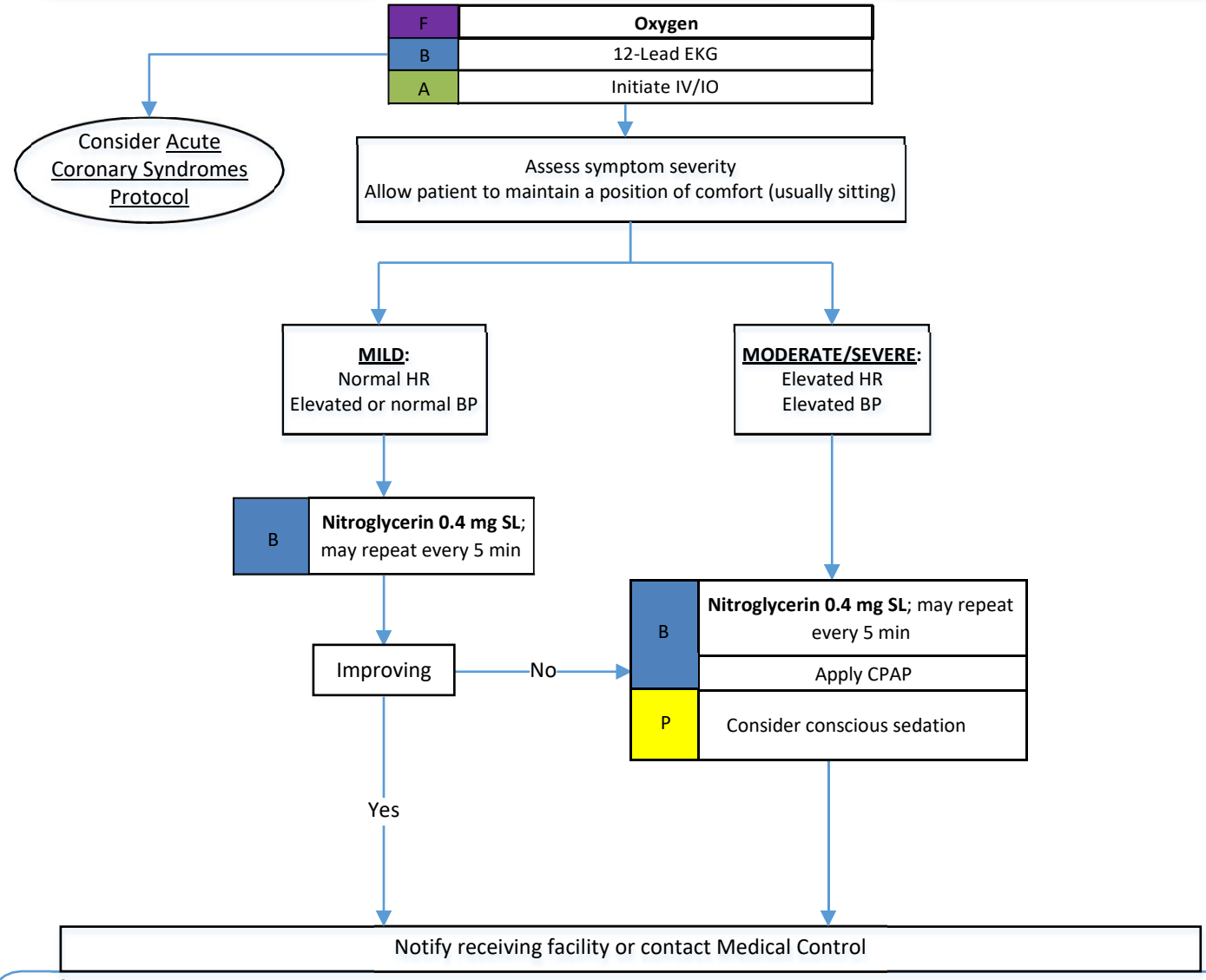
PEARLS:
- If bradycardic patient is also a STEMI, follow the STEMI guidelines.
- For transcutaneous pacing set rate for 70 beats per minute. Increase current (mA) until electrical and mechanical capture occur or pacing current reaches (200 mA).
- For Conscious sedation, see Sedation/Anxiety protocol. 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 Epineprhine 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.

CHF/Pulmonary Edema

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**.
- **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)

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

F	**Oxygen**
B	12-Lead EKG
A	Initiate IV of **Normal Saline** (INT is not acceptable)
P	Attempt valsalva maneuver

Stable

Unstable

QRS <.12

No

See: V-Tach Protocol

Regular

Irregular

P	**Adenosine (Adenocard) 12 mg rapid IV**; may repeat once in 5

Improving

NO

P	**Diltiazem (Cardizem) 20 mg IV** if SBP >90
	After 15 min of uncontrolled A-fib or SVT administer **Diltiazem (Cardizem) 25 mg IV**; be prepared to provide fluids if BP drops
	If Diltiazem is unavailable consider **Metoprolol 5 mg IV/IO slow push**; may repeat a 2nd dose of 5 mg; max total dose 10 mg

P	Consider conscious sedation (see **PEARLS**)
	Synchronized Cardioversion:
	• Cardiovert (synchronized) **100 joules**
	• Cardiovert (synchronized) **200 joules**
	• Cardiovert (synchronized) **300 joules**
	• Cardiovert (synchronized) **360 joules**
	Consider **Diltiazem (Cardizem) 20 mg IV over 2 min** if SBP >90

Notify receiving facility or contact Medical Control

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.

Sustained Ventricular Tachycardia (QRS >0.12)

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

No → See appropriate protocol

Yes

F	**Oxygen**
B	12-Lead EKG
A	Initiate IV

Stable

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

Unstable

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

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.

Medical Cardiac Arrest

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

Criteria for Death/DNR

Yes

Withhold Resuscitation:
- See **COG 1.4** for criteria for death/withholding resuscitation

No

M	Contact Medical Control or Coroner

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

V-fib/pulseless V-tach

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

Asystole/PEA

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

Return of spontaneous circulation

Yes → See: Post Resuscitation protocol

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 difibrillator 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 $EtCO_2$ frequently, after every move, and at transfer of care.

Adult Cardiac Arrest

Ensure adequate space to work

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

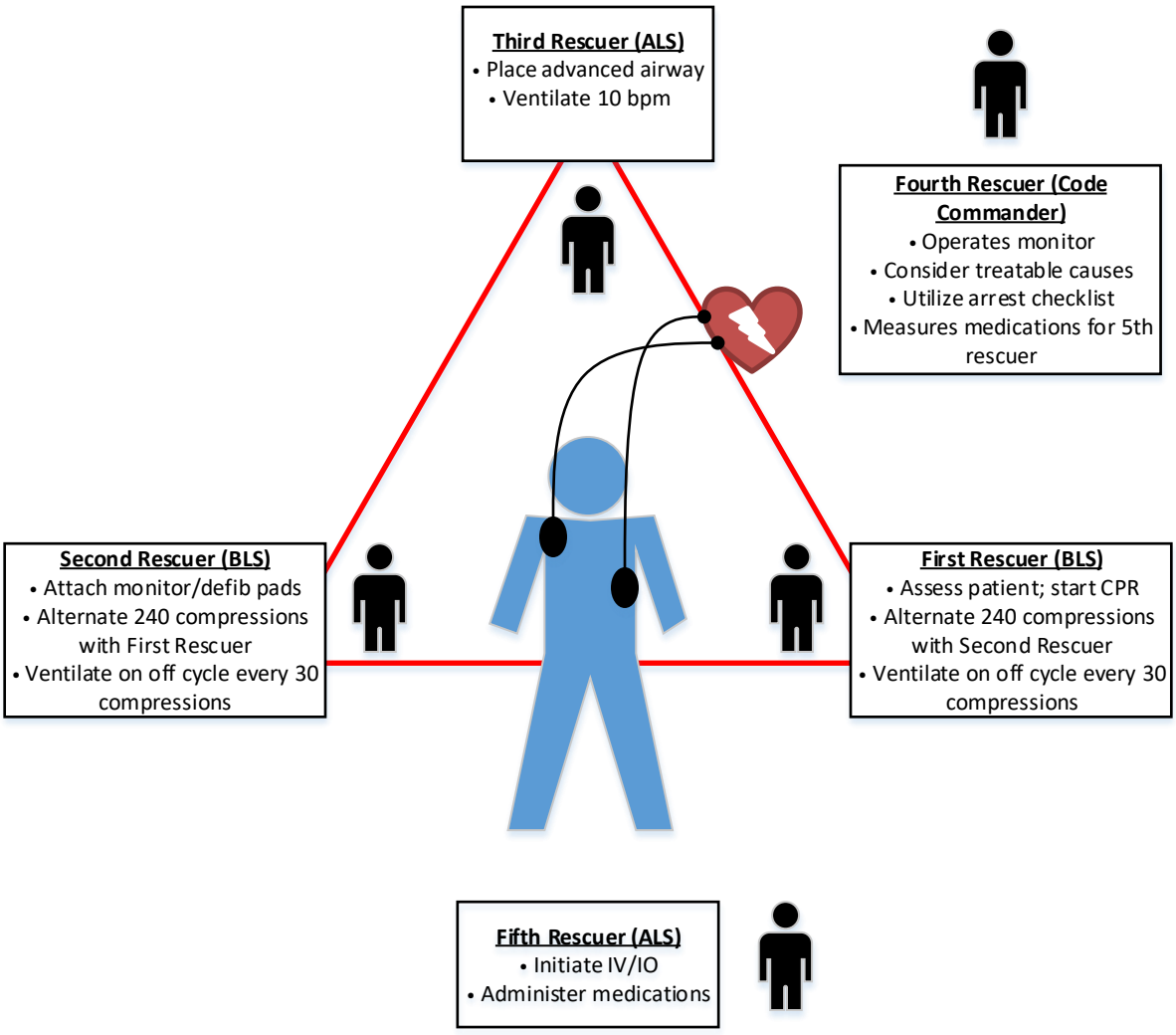
FIRST CREW ON SCENE	**FIRST RESCUER**	Begin continuous CPR compressions; push hard (adult: >2 inches; child: >1½ inches) push fast (100-120/min); change compressors every 2 min (limit changes/pulse checks to <5 sec) during entire arrest
	SECOND RESCUER	Attach AED/monitor and defibrillate as necessary;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

CODE COMMANDER
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

Adult Cardiac Arrest

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: **H**ypovolemia, **H**ypoxia, **H**ydrogen ions (acidosis), **H**yperkalemia, **H**ypothermia, **H**ypo/**H**yperglycemia, **T**ablets/**T**oxins/**T**ricyclics, **T**amponade, **T**ension pneumothorax, **T**hrombosis (MI), **T**hromboembolism (Pulmonary Embolism), **T**rauma.
- 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.


Third Rescuer (ALS)
• Place advanced airway
• Ventilate 10 bpm
Fourth Rescuer (Code Commander)
• Operates monitor
• Consider treatable causes
• Utilize arrest checklist
• Measures medications for 5th rescuer
Second Rescuer (BLS)
• Attach monitor/defib pads
• Alternate 240 compressions with First Rescuer
• Ventilate on off cycle every 30 compressions
First Rescuer (BLS)
• Assess patient; start CPR
• Alternate 240 compressions with Second Rescuer
• Ventilate on off cycle every 30 compressions
Fifth Rescuer (ALS)
• Initiate IV/IO
• Administer medications

Post Resuscitation

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; **100% Oxygen**; $EtCO_2$ ideally >20; RR ≤12;
B	12-Lea d EKG
A	Pl a ce 2nd IV/IO

Termination of ventricular rhythm

Yes → P

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

No

Sustained Pulse

- Hypotension → Follow Hypotension Guideline
- STEMI → Follow Acute Coronary Syndrome Guideline
- Bradycardia → Follow Bradycardia Guideline

Notify receiving facility or contact Medical Control

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.

Abdominal Pain

History:
- Age
- Past medical/surgical history
- Medications
- **O**nset
- **P**alliation/**P**rovocation
- **Q**uality (crampy/constant/ sharp/dull/ etc.)
- **R**egion/**R**adiation/**R**eferred
- **S**everity (1-10)
- **T**ime (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 → See: Nausea/Vomiting Protocol

Yes → A

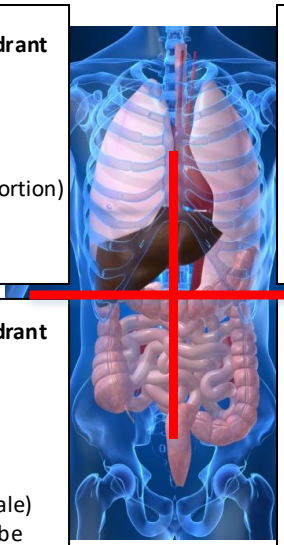
A	≥12 years old or >55 kg: **Normal Saline up to 1,000 mL IV** to reduce signs of hypotension
	1 day to 11 years old or <55 kg: **Normal Saline 20 mL/kg IV; max 60 mL or 1,000 mL**

No → 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

Medical

Altered Mental Status/Diabetic Emergencies

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

F	**Oxygen**
B	Obtain BGL
A	Initiate IV

Glucose <60 with signs of hypoglycemia

B	Consider **Oral Glucose 1-2 tubes** if awake and no risk for aspiration
A	**10% Dextrose (D10) 250 mL IV**
A	If no IV access, administer **Glucagon (GlucaGen) 1 mg IM/SQ**

Glucose >60 with altered mental status

See appropriate Protocol: Cardiac, Hyper/ Hypothermia, Seizure, Hypotension

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

B	12-Lead EKG
A	**Normal Saline up to 1,000 mL IV**

Notify receiving facility or contact Medical Control

Medical

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
  - o Antipsychotics
  - o Antiemetics
  - o 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	**Oxygen**
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.

Hives/rash only; No respiratory component

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

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

Respiratory distress — No

Yes

A	**Albuterol (Ventolin) 5 mg via nebulizer**

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).**
- Methyloprednisone (Solumedrol) 125 mg IV may be administered for isolated angioedema caused by Ace inhibitors

Medical

Anaphylactic Shock/Allergic Reaction (BLS Only)

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
  - o Antipsychotics
  - o Antiemetics
  - o 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 Extrapyrmadial 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 ofhypotension

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 **antimetics**: 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

Behavioral Emergencies/Chemical Restraint

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

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

→ Medical Patient or glucose <60 with signs of hypoglycemia → See appropriate Protocol: AMS, Poisoning, Trauma

Patient remains combative and is unable to be calmed

No → Suspected agitated delirium: (Hyper-aggression, hyperthermia, diaphoretic)

No → Notify receiving facility or contact Medical Control

Yes

P	**Consider Midazolam (Versed) 5 mg/ 1mL IM; may repeat once after 5 minutes**

Or

P	**Consider Ketamine 4 mg/KG IM, Max Dose 400 MG**

Yes

A	**Normal Saline up to 1,000 mL IV**
B	Consider external cooling

Cardiac arrest

Yes →

P	**Sodium Bicarbonate 1 mEq/kg IV**

→ See: Cardiac Arrest Protocol

No → Notify receiving facility or contact Medical Control

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 larynogspasm 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 disassociation 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

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

Eclampsia:
Seizure or seizure-like activity

B	Obtain BGL
A	**50% Dextrose (D50) 25 grams IV** if needed
P	**Midazolam (Versed) 10 mg/2 mL IM or 2.5 -5 mg/0.5-1mL IV**
	Magnesium Sulfate 4 grams/8 mL IV over 2-3 min

Improving → No → P: **Midazolam (Versed) 10 mg/2 mL IM or 2.5-5 mg/0.5-1 mL IV**

Yes

Pre-eclampsia:
Severe headache
Vision changes
RUQ pain
Hypertension
Edema of hands and feet
Sudden weight gain

Continue to monitor

Transport left lateral recumbent and notify receiving facility or contact Medical Control

Medical

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

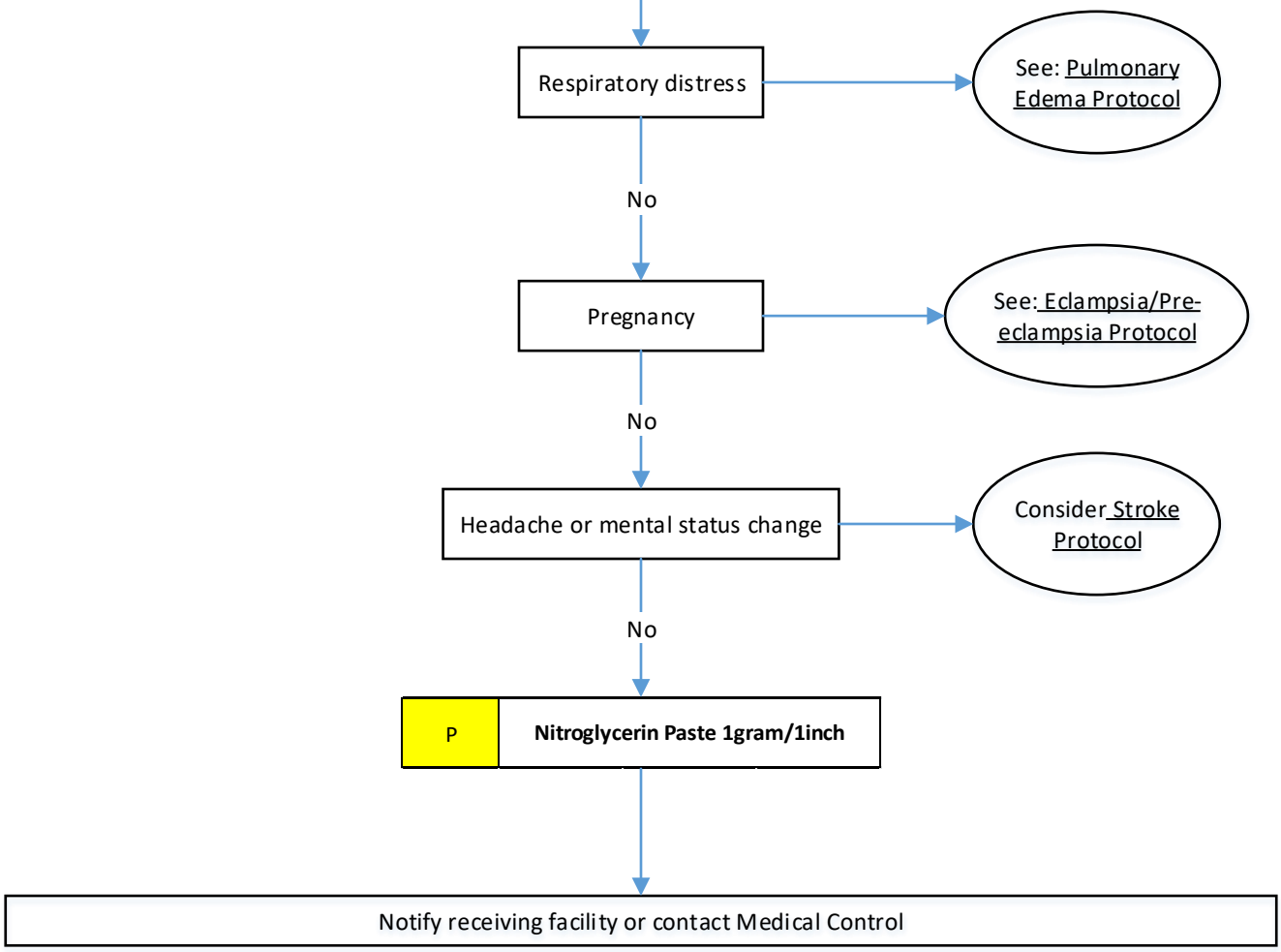
History:
- Documented hypertension
- Pregnancy
- Medications (compliance ?)
- Related diseases
  - Diabetes
  - CVA
  - Renal failure
  - Cardiac
- Erectile dysfunction medication
  - Levitra
  - Cialis
  - Viagra

Significant Findings:
One of these
- Systolic BP ≥220
- Diastolic BP ≥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



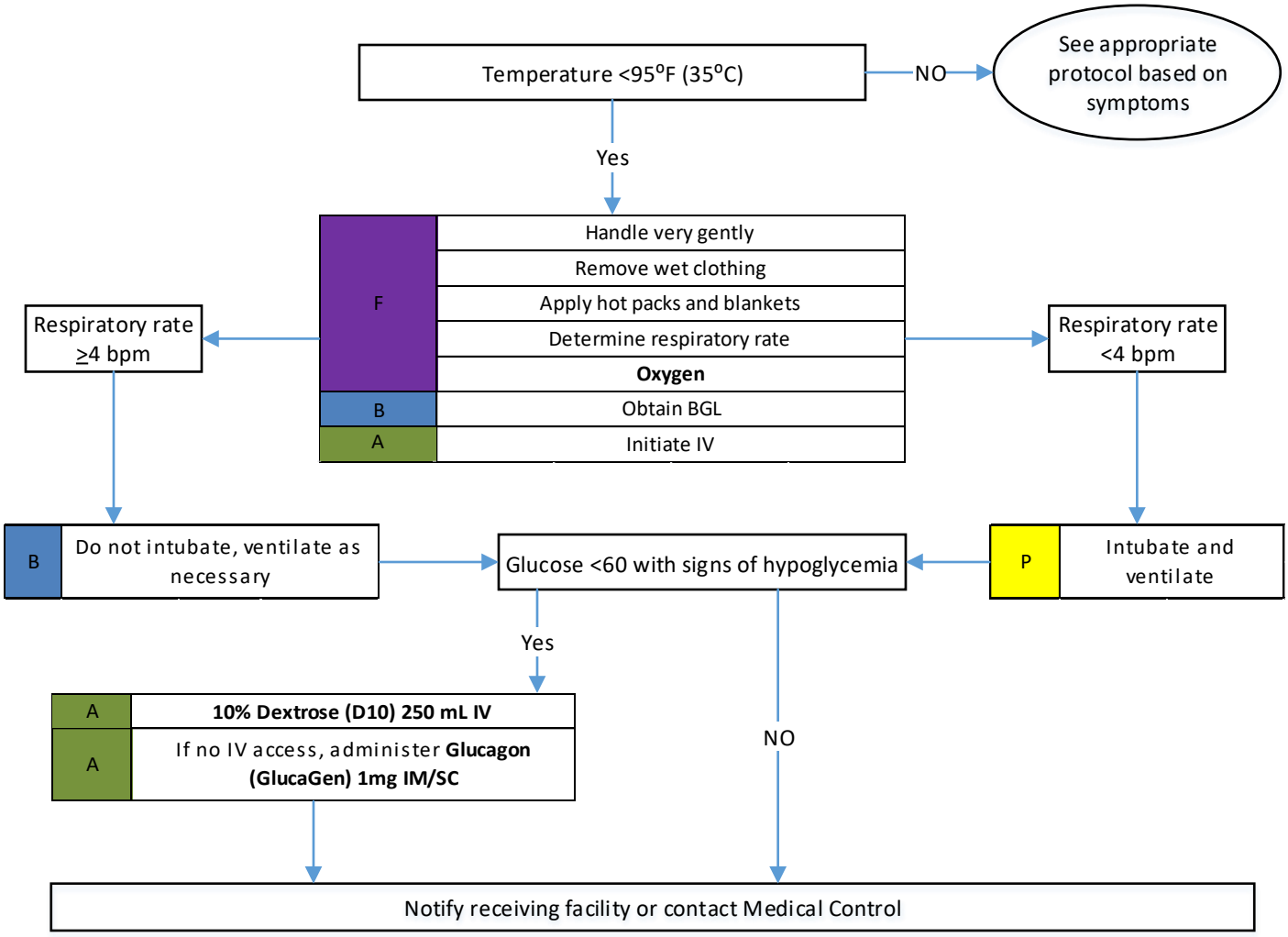
PEARLS:
- **Never treat elevated blood pressure based on one set of vital signs or on vital signs alone**.
- Check blood pressure in both arms.
- Symptomatic hypertension is typically revealed through end organ damage to the cardiac, central nervous system or renal systems.
- All symptomatic patients 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.

Hypothermia

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 then 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.

Medical Hypotension

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)

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

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

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

Improvement
- Yes
- No

M	Request additional fluid

Hypotension due to bradycardia

See: Bradycardia Protocol

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 (Norephinephrine) 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.

Nausea/Vomiting/Diarrhea

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

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

Signs of hypotension → See: Medical Hypotension Protocol

8-15 kg

P	**Zofran (Ondansetron) 2 mg slow IV/IM over 2 min**

>15 kg

P	**Zofran (Ondansetron) 4 mg slow IV/IM**, may be repeated once after 10 min; 4 mg ODT can be substituted

Notify receiving facility or contact Medical Control

PEARLS:
- **ODT Zofran (Ondansetron) 4 mg can be given to a previously healthy child ≥ 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, bowl 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.

Obstetrical Emergencies

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

Assess for crowning

No → Monitor and reassess; document frequency and duration of contractions

Yes → Position mother for birth

F	**Oxygen**
A	Initiate IV; infuse fluid at a rate sufficient to prevent hypovolemic shock

Check for:
- Nuchal cord
- Prolapsed cord
- Breech birth
- Multiple births

B	Gently press on perineum to prevent explosive birth and unnecessary tearing
	Anterior shoulder normally delivers first followed by posterior shoulder
	Suction mouth then nose **(Only If Needed)**
	Place neonate immediately on mom's chest, unless extensive resuscitation is anticipated
	Clamp and cut cord after 30-60 seconds
	Record infant APGAR
	Warm and dry neonate
	Deliver placenta

Excessive bleeding >500 ml

Yes →

B	Perform uterine massage
P	**Oxytocin (Pitocin) 20 units (in 1,000 mL Normal Saline) slow IV administration**; titrate according to severity of bleeding
B	Facilitate breast feeding to increase uterine contraction

No →

Notify receiving facility or contact Medical Control

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.

Medical

Pain Management (Adult)

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	**Oxygen**
A	Initiate IV, INT not acceptable
B	Complete set of vital signs including SaO2

B	Consider **Nitrous Oxide**
P	Consider **Zofran (Ondansetron)** 4 mg IV/IO/IM
	Consider **Ketorolac (Toradol)** 15 mg IV, or 30 mg slow IM single dose
	Ketamine 0.3mg/kg IV/IO; 30mg max single dose; may repeat once after 15 minutes
	OR
	Morphine 0.1 mg/kg IV/IO/IM; max single dose of 5mg; may repeat once
	OR
	Fentanyl 2 mcg/kg slow IV/IO/IM 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.

Poisoning/Overdose

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

Glucose <60 with signs of hypoglycemia

See: AMS/ Diabetic Emergency Protocol

F	**Oxygen**
B	12-Lead EKG
	Obtain BGL
A	Initiate IV
A	**Naloxone (Narcan) 2 mg IV/IM** if patient experiencing respiratory depression; may repeat once

Seizure

See: Seizure Protocol

Calcium channel blockers: Hypotension and bradycardia

P	**Calcium Gluconate (Kalcinate) 5-20 mL IV**
A	**Glucagon (GlucaGen) 2 mg IV**

Tricyclic antidepressant: Hypotension, tachycardia, and QRS >0.12

P	**Sodium Bicarbonate 1 mEq/kg IV**

Organophosphate poisoning: Hyotension and tachycardia; S.L.U.D.G.E.

P	**Atropine 1-2 mg IV**; may repeat every 5 min; **max 6 mg**

Beta blocker: Hypotension and brady cardia

A	**Glucagon (GlucaGen) 2 mg IV**

Notify receiving facility or contact Medical Control

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.**: **S**alivation, **L**acrimation, **U**rination, **D**efecation, **G**I distress, **E**mesis.
- **D.U.M.B.B.E.L.S.**: **D**iarrhea, **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.

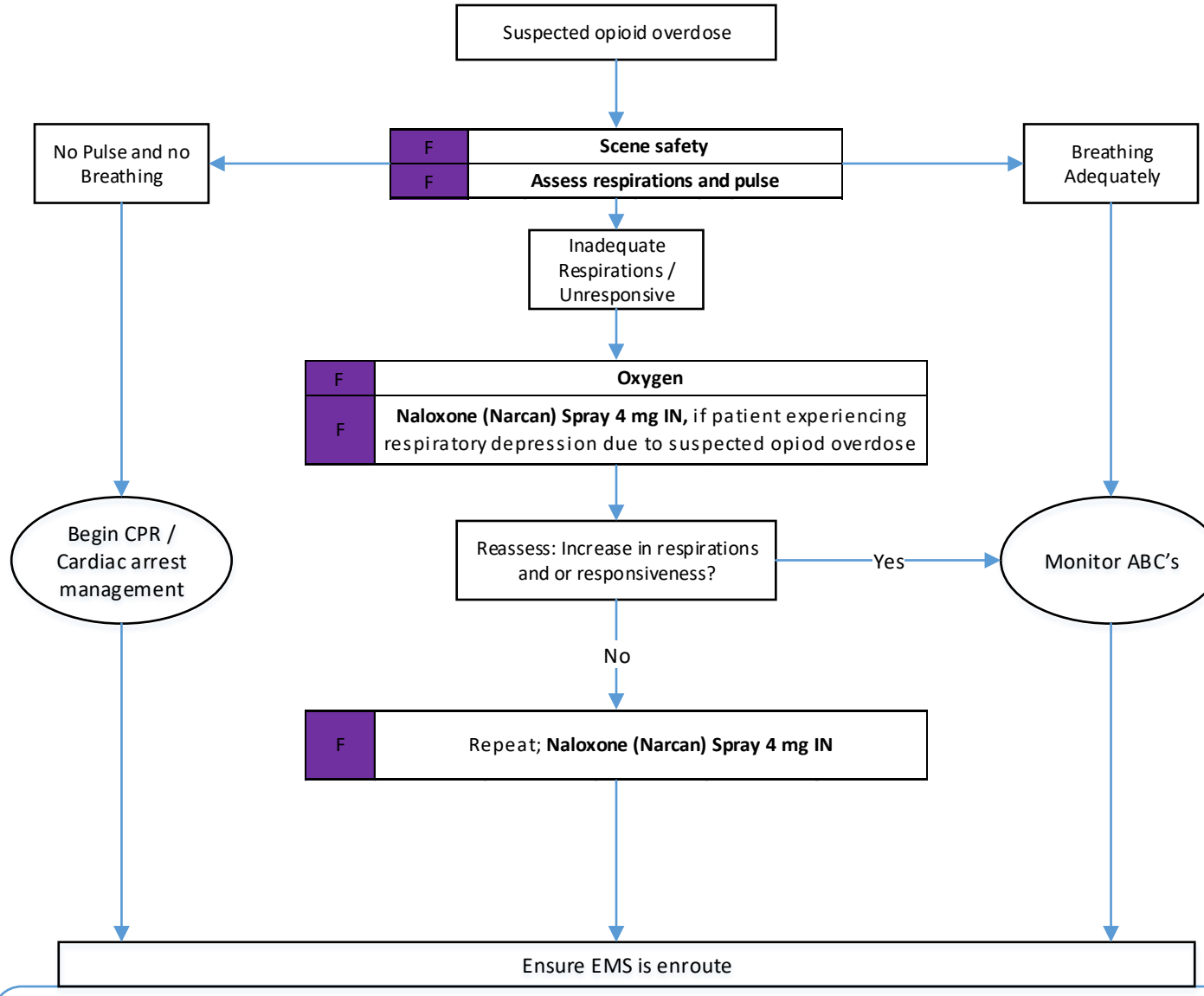
Consider restraints if necessary for patient's and/or personnel's protection per the **Behavioral Emergencies/Chemical Restraints Protocol**

Opioid Overdose (First Responder Only)

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 speach

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

Reactive Airway Disease

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 O_2 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/H20**; 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/H20**
	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.
- $EtCO_2$ 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.

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 O_2 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

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

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
	DO NOT increase pressure
A	Consider **Epinephrine 1:1,000 0.3 mg IM**

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.
- $EtCO_2$ 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

Sedation / Anxiety

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	**Oxygen**
B	Apply monitor
A	Initiate IV

CPAP, Burns

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

Severe anxiety

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

Procedural Sedation

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

Notify receiving facility or contact Medical Control

PEARLS:

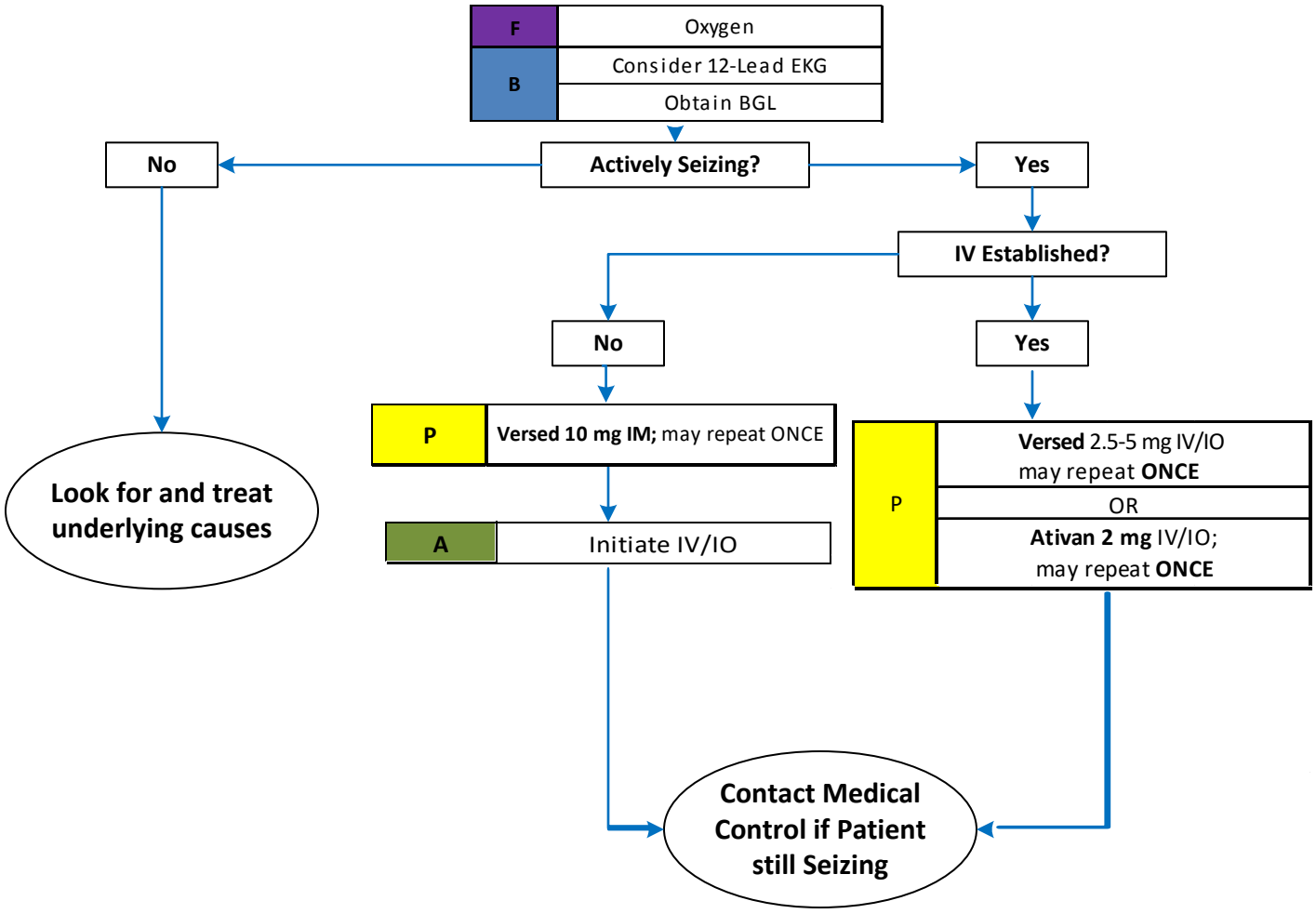
- **Severe anxiety:** Inhibits assessment, respiratory rate >30, inability to be reassured by non-pharmaceutical methods.
- **CPAP:** Dose should be titrated to provide comfort without causing unconsciousness or respiratory failure; just enough to reduce agitation.
- **Procedural Sedation:** Cardioversion, transcutaneous pacing.
- Always be prepared for airway management during sedation, **Ketamine** can cause laryngospasms.
- **Ketamine** is contraindicated in severe hypertension (≥210 systolic or ≥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.

Seizures

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



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.

Sepsis

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

F	**Oxygen**
	Full set of vital signs including temperature, pulse oximetry, and respiratory rate
B	12-Lead EKG
	Obtain BGL
A	Draw 1 set of blood cultures
	Draw Lactate per recieving destination
	Initiate IV administer 1,000ml
	Establish second IV when feasible
B	Notify the receiving facility of the Sepsis alert

Glucose <60 signs of hypoglycemia → See: AMS/ Diabetic Emergency Protocol

Documented or reported Penicillin Allergy

Yes → P **Rocephin 2 Grams IV**; over 10 minutes

No → Nursing Home Patient?

Nursing Home Patient? Yes → P **Zosyn 4.5 or 3.375 Grams IV**; over 10 minutes

Nursing Home Patient? No → Suspected pneumonia?

Suspected pneumonia No → P **Zosyn 4.5 or 3.375 Grams IV**; over 10 minutes

Or

P **Rocephin 2 Grams IV**; over 10 minutes

Suspected pneumonia Yes → P **Rocephin 2 Grams IV**; over 10 minutes

Notify receiving facility or contact Medical Control

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 mainatin 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

Stroke/CVA/TIA

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 Glascow coma scale and Cincinnati stroke scale on patients who present with signs/symptoms of stroke

F	**Oxygen**
B	12-Lead EKG
	Obtain BGL
A	Initiate IV; establish 2nd IV enroute if time permits
B	Obtain R.A.C.E Score and notify the receiving facility as soon as possible of the Stroke alert

Glucose <60 signs of hypoglycemia → See: AMS/ Diabetic Emergency Protocol

R.A.C.E score

R.A.C.E Score < 4

Transport to **Acute Stroke Ready Hospital (ASRH), Primary Stroke Center (PSC), Thrombectomy-Capable Stroke Center (TSC)** or **Comprehensive Stroke Center (CSC)**

A	Draw labs if time permits

R.A.C.E Score ≥ 4

Transport to **Comprehensive Stroke Center (CSC)**

P	Consider Rapid sequence Induction

Notify receiving facility or contact Medical Control

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.

Medical

Syncope

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
- Micturation / Defecation syncope
- Psychiatric
- Stroke
- Hypoglycemia
- Seizure
- Shock
- Toxicologic
- Medication effect (hypotension)
- AAA
- PE

Universal Patient Care Protocol

↓

Consider Spinal Motion Restriction Protocol

↓

F	Complete set of vital signs including SaO2
B	Assess Blood Glucose
B	Orthostatic blood pressure
B	12-Lead EKG

→ **See AMS/Diabetic Emergencies protocol**

↓

Follow Appropriate Guideline

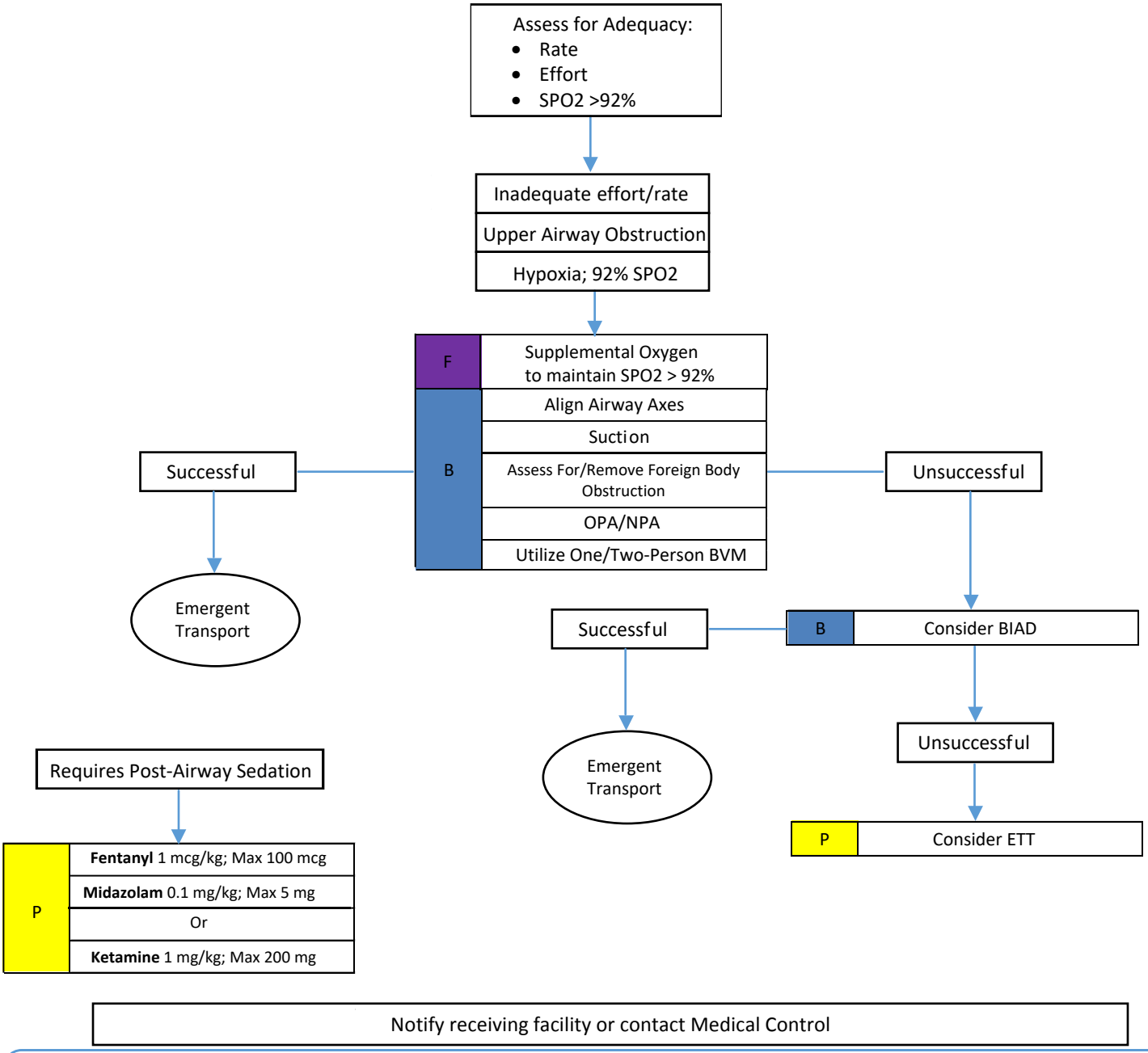
↓

Notify receiving facility or contact Medical Control

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 Prehosptial Stroke Scale.
- These patients should be transported.
- More than 25% of geriatric syncope is related to cardiac dysrhythmia.

Pediatric: Universal Airway



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.
- 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

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

Criteria for Death/DNR

Yes → **Withhold Resuscitation:**
- See **COG 1.4** for criteria for death/withholding resuscitation

→ M: Contact Medical Control or Coroner

No

F	Refer to Team Approach CPR
	Immediate continuous compressions
B	Cardiac monitor/AED
	Treat correctable causes early
	Place BIAD and provide 20-30 breaths per minute
A	Initiate IV/IO

V-fib/pulseless V-Tach

P	Defibrillate **2 joules/kg**; all subsequent shocks at **4 joules/kg**
	Epinephrine 0.01 mg/kg (0.1 mL/kg) IV/IO; may repeat every 3-5 min
	Amiodarone (Cordarone) 5 mg/kg IV/IO; may repeat twice; not to exceed adult dose

Asystole/PEA

P	**Epinephrine 0.01 mg/kg (0.1 mL/kg) IV/IO**; may repeat every 3-5 min

See: Post Resuscitation Protocol

Return of spontaneous circulation → Yes → See: Post Resuscitation Protocol

Pediatric

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 $EtCO_2$ frequently, after every move, and at transfer of care.

Pediatric Bradycardia

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 **Oxygen** and hyperventilate patient approximately 2 min
B	12-Lead EKG
A	Initiate IV/IO

Improving

Yes → Continue to monitor and reassess

No → HR <60 with signs of poor perfusion

F	Refer to Team Approach CPR
P	**Epinephrine 0.01 mg/kg (0.1 ml/kg) IV/IO**; may repeat every 3-5 min
P	**Atropine 0.02 mg/kg (0.2 mL/kg) IV/IO; min 0.1 mg, max 0.5 mg**; may repeat once in 5 min
A	Consider **10% Dextrose (D10) 5 mL/kg IV** or **Normal Saline 20 mL/kg IV; max 60 mL/kg or 1,000 mL**
P	Consider transcutaneous pacing (see **PEARLS**)

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**.
- 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)

Pediatric: Post Arrest

History:
- Respiratory arrest
- Cardiac arrest

Significant Findings:
- Return of pulse

Differential:
- Address specific differentials associated with the original dysrhythmia

F	Continue ventilatory support; **supplemental O2 to maintain SPO2 above 94%**; $EtCO_2$ ideally 35-45; RR <12; **DO NOT HYPERVENTILATE**
B	12-Lead EKG
A	Place 2nd IV/IO

Persistent arrhythmia (arrhythmias are common and usually resolve themselves after ROSC) → See appropriate protocol

No

Hypotension

A	Consider **Normal Saline 20 mL/kg IV/IO; max 60 mL/kg or 1,000 mL**
M	If still hypotensive after fluid bolus consider **Push Dose Epi 10 mcg (1 ml)**

Hypoglycemia

A	Consider **10% Dextrose (D10) 5 mL/kg IV/IO**; may repeat once if BGL still low

Bradycardia

P	**Epinephrine 0.01 mg/kg (0.1 mL/kg) IV/IO**; may repeat every 3-5 min
	Consider **Atropine 0.02 mg/kg (0.2 mL/kg) IV/IO, min dose 0.1 mg; max dose 0.5 mg**; may repeat once in 5 min
	Consider transcutaneous pacing (see **PEARLS**)

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 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

Pediatric Unstable Tachycardia

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 (≤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 **PEARLS**)
	Cardiovert (synchronized) **0.5-1 J/kg**; increase to **2 J/kg** if necessary

Wide QRS (>0.08)

P	Consider conscious sedation (see **PEARLS**)
	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.

Ped. Altered Mental Status/Diabetic Emergencies

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

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

Glucose >60 with altered mental status

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

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

M	Contact Medical Control

Notify receiving facility or contact Medical Control

Pediatric

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.

Ped. Anaphylactic Shock/Allergic or Dystonic Reaction

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**

Hives/rash only; No respiratory component

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

A	**Epinephrine 1:1,000 0.01 mg/kg IM; max 0.5 mg**; may be repeated every 15 min; max 4 doses
A	**Normal Saline 20 mL/kg IV**; **max 60 mL/kg or 1,000 mL** to reduce signs of hypotension
P	**Methylprednisolone (Solumedrol) 2 mg/kg IV**; **max 125 mg**

Respiratory distress

No

Yes

A	**Albuterol (Ventolin) 2.5 mg via nebulizer**

Notify receiving facility or contact Medical Control

Pediatric

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

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
	Oxygen
B	Measure temperature
A	Initiate IV
	Consider **Normal Saline 20 mL/kg IV; max 60 mL/kg** or **1,000 mL**

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_2 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 Medical Hypotension

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

Hypotension due to cardiogenic shock (tachycardia)

A	**Normal Saline 5 mL/kg IV; max 60 mL/kg or 1,000 mL**
M	**Push Dose Epi 10 mcg (1 ml) q 3-5 minutes**

See appropriate Cardiac protocol

Non-trauma Non-cardiac (no bradycardia)

A	**Normal Saline 20 mL/kg IV; max 60 mL/kg or 1,000 mL**

Improvement

- No → M: Request additional fluid
- Yes → Notify receiving facility or contact Medical Control

Hypotension due to bradycardia

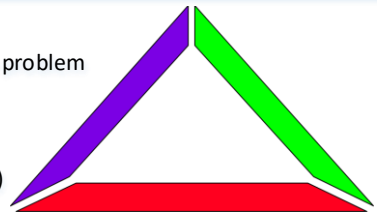
See: Bradycardia Protocol

Pediatric

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

A	**Combivent (DuoNeb)** and/or **Albuterol** 2.5 mg via nebulizer may repeat Albuterol once to **max 5 mg**
A	Initiate IV if O_2 <92% after first treatment
M	For severe respiratory distress characterized by difficulty speaking, accessory muscle use, or low O_2; request **Epinephrine 1:1,000 0.15 mg IM**

Stridor

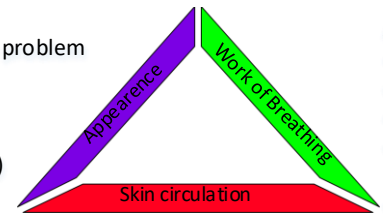
P	Consider **Racemic Epinephrine 0.5 mL (diluted to 3 mL with Normal Saline) via nebulizer**, may NOT be repeated
A	Initiate IV if O_2 <92% after first treatment
M	For severe respiratory distress characterized by difficulty speaking, accessory muscle use, or low O_2; request **Epinephrine 1:1,000 0.15 mg IM**

Notify receiving facility or contact Medical Control

Pediatric

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**.

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



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

Skin circulation
- Reflects overall adequacy of perfusion

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 (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_2 <92% after first treatment

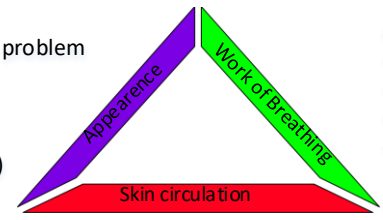
↓

Notify receiving facility or contact Medical Control

Pediatric

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



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

Skin circulation
- Reflects overall adequacy of perfusion

Abnormal appearance + Poor circulation = SHOCK

Abnormal appearance + Change in work of breathing = RESPIRATORY FAILURE

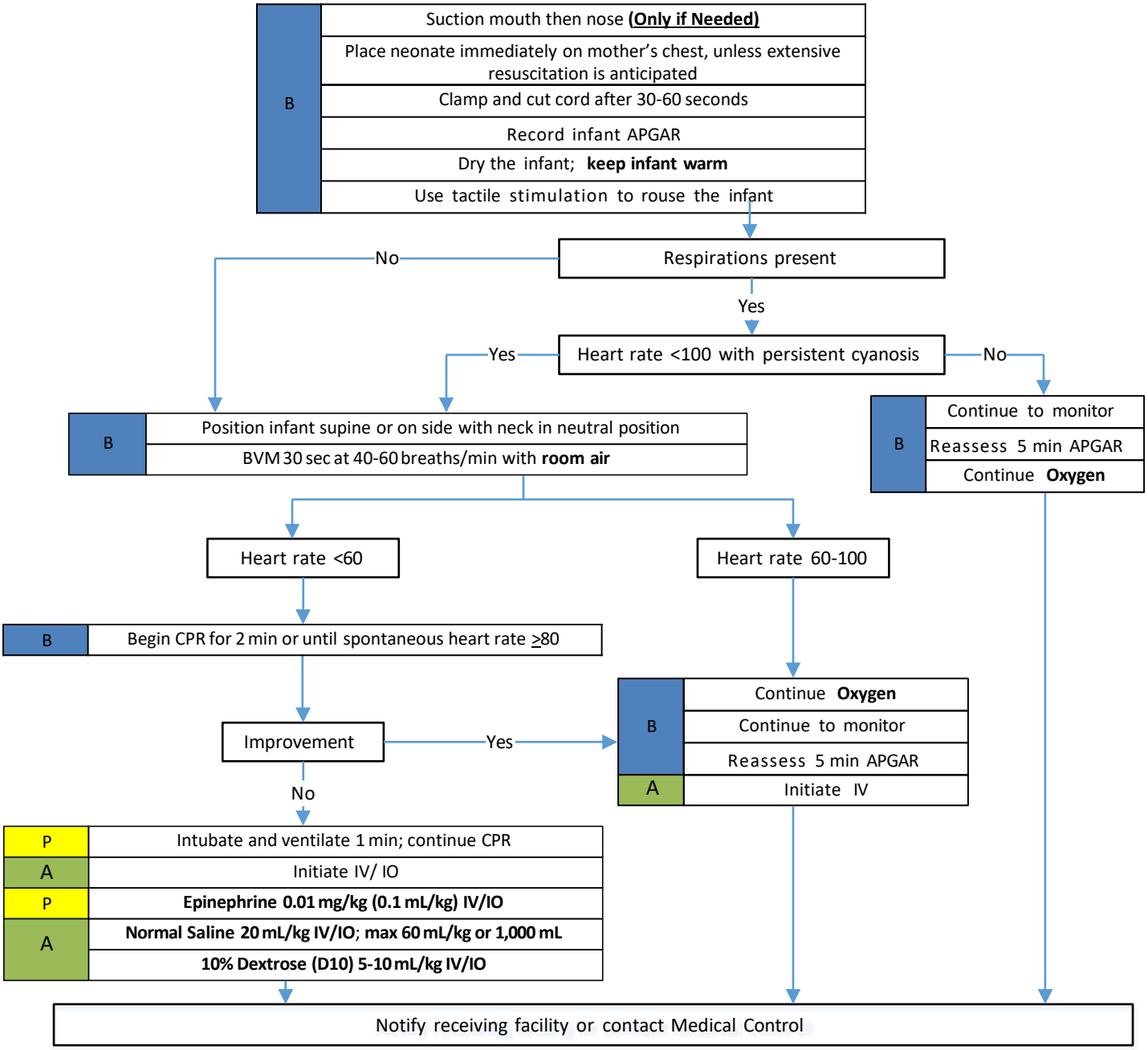
Normal appearance + Change in work of breathing = RESPIRATORY DISTRESS

Newly Born

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

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



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

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	**Oxygen**
A	Initiate IV, INT not acceptable
B	Complete set of vital signs including SaO2

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

Notify receiving facility or contact Medical Control

Pediatric

PEARLS:
- Pediatric = 1 day to less than age 12, or less than 55 kg in ages 12-18.
- **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 x age) SBP
  - **greater than 11**: less than 90 + (2 x 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 Poisoning/Overdose

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)

Glucose <60 with signs of hypoglycemia

See Pediatric AMS/Diabetic Emergency Protocol

F	**Oxygen**
B	12-Lead EKG
	Obtain BGL
A	Initiate IV
A	**Naloxone (Narcan) 0.1 mg/kg IV/IM; max 2 mg** if patient experiencing respiratory depression

Seizure

See: Pediatric Seizure Protocol

Calcium channel blocker: Hypotension and bradycardia

M	**Calcium Gluconate (Kalcinate) 50-100 mg/kg slow IV**
	Glucagon (GlucaGen) 2 mg IV

Tricyclic antidepressant: Hypotension, tachycardia, and QRS width >0.12

M	**Sodium Bicarbonate 1 mEq/kg IV**

Organophosphate poisoning: Hypotension and tachycardia; S.L.U.D.G.E

M	**Atropine 0.05-0.1 mg/kg IV**; may repeat every 10 min; **max 6 mg**

Beta blocker: Hypotension and bradycardia

M	**Glucagon (GlucaGen) 2 mg IV**

Notify receiving facility or contact Medical Control

Pediatric

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**iarrhea, **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

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

F	Oxygen
B	Consider 12-Lead EKG
	Obtain BGL
A	Initiate IV
P	**Midazolam (Versed)** 0.1 mg/kg IM; max dose 5 mg (If no IV/IO established)
	OR
	Lorazepam (Ativan) 0.1 mg/kg IV/IO; max dose 2 mg (If IV/IO established)

Still Seizing?

NO → Follow Appropriate Guideline

YES →

M	**Midazolam (Versed)** 0.1 mg/kg IM, max dose 5 mg OR **Lorazepam (Ativan)** 0.1 mg/kg IV/IO, max dose 2 mg

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 consciouness 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.

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, elevation, and pressure points do 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. Expose patient to perform a detailed physical exam.
11. Cover and keep patient warm between assessments in order to conserve body heat.
12. If patient's presentation, or the mechanism of injury, meets **Trauma Alert Criteria**:
13. Call for a paramedic unit. If transport time is less than ALS unit arrival, start transport as soon as possible.
14. **Rapidly extricate** with **cervical spine immobilization.**
15. Try to keep scene time to **10 minutes or less.** If scene time exceeds 10 minutes, document the reason for the delay.
16. 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. Apply cardiac monitor.
19. 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.
20. If an IV cannot be established and an urgent need for vascular access exists, establish IO access.

Bites and Envenomation

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

F	Consider **Oxygen**
F	Position patient supine; immobilize area or limb
F	Remove rings, bracelets, and other constricting items
B	Consider 12-Lead EKG
B	Consider obtaining BGL
A	Consider initiating IV

See: Allergic Reaction Protocol

Allergic/Anaphylactic reaction — YES

No

Spider bite/bee/wasp

F — Apply ice to affected area

Muscle spasm? — No

Yes

P — **Midazolam (Versed) 1-5 mg slow IV push** or **Lorazepam (Ativan) 1-2 mg IV/IM** (for pediatrics see **PEARLS**)

Snake, Animal or human bite

F — Control bleeding

Significant Pain? — Yes — See: Pain Management protocol

No

Notify receiving facility or contact Medical Control

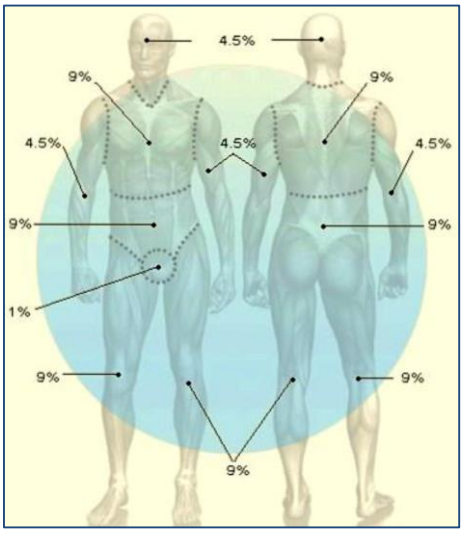
PEARLS:
- For pediatrics muscle spasms, call Medical Control prior to **Midazolam (Versed)** or **Lorazepam (Ativan)** administration.
- Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- Carnivore bites are much more likely to become infected and all have risk of rabies exposure.
- Cat bites may progress to infection rapidly due to a specific bacteria (Pasteurella multicoda).
- 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.

Burns: Thermal/Radiation

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 **Normal Saline**
	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
	Identify entry and exit sites; apply sterile dressings
B	Consider 12-Lead EKG

Critical or hypotensive?

- No → Notify receiving facility or contact Medical Control
- Yes → A

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

Notify receiving facility or contact Medical Control

Critical

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

Serious

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

Minor

<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).

Chest and Abdominal Trauma

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

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

Blunt

B	Consider Spinal Immobilization
A	Just enough **Normal Saline IV** 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.**

Crush Injuries

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

6 P's
- **P**ain
- **P**allor/**P**aleness
- **P**ulselessness
- **P**aralysis
- **P**aresthesia (tingling or burning sensation on skin
- **P**oikilothermia (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

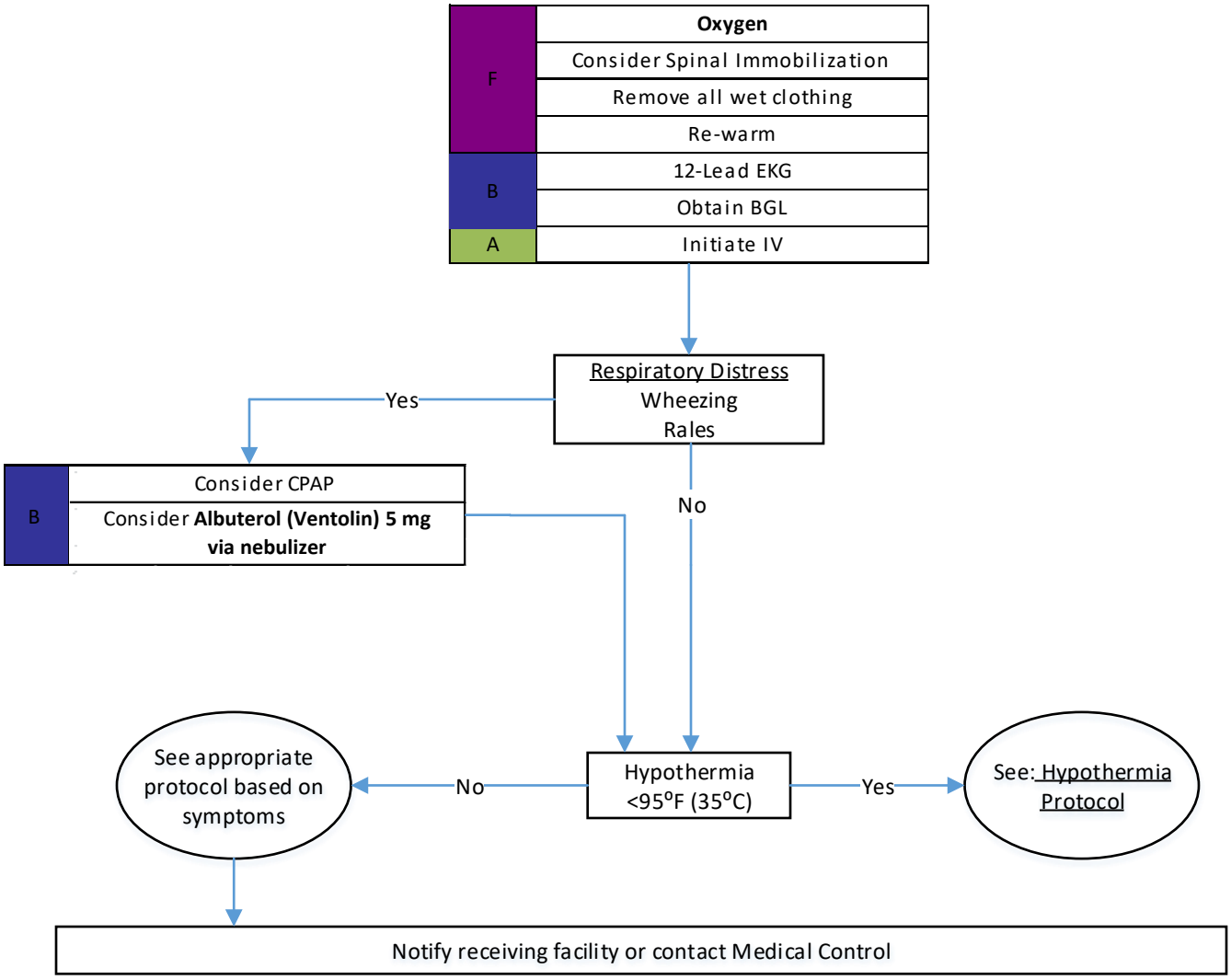
PEARLS:
- Fluid administration should be conducted prior to patient extrication.
- Treatment may be compromised by confined space or MCI situation. Ideally, start treatment prior to release of compression.
- Patients may become hypothermic even in warm environments.
- Other injuries can cause compartment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

Drowning & Submersion Injuries

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



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.

Extremity Trauma/Amputation

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
	Oxygen
A	Initiated IV; treat for signs of poor perfusion

Associated Pain → See: Pain Management protocol

Associated Pain → Fracture or dislocation / Amputation / Hemorrhage

Fracture or dislocation

B	If extremity is pulseless, attempt gentle manipulation to place in normal anatomic position to restore circulation
	Hip fracture/dislocations should be stabilized with the use of a scoop stretcher if full spinal immobilization is not required

P: Suspected Fracture with an open wound?
- Yes → Documented or reported cephalosporins Allergy?
- No → Notify receiving facility or contact Medical Control

Documented or reported cephalosporins Allergy?
- Yes → Notify receiving facility or contact Medical Control
- No → P: **Adult- 2 g IV Rocephin** over 10 minutes; **Pediatric- 50 mg/kg** to a max dose of **1 g IV Rocephin** over 10 minutes.

Amputation

F	Clean amputated part
	Wrap part in sterile dressing soaked in **Normal Saline** and place in air tight container (sealed bag)
	Place container on ice if available

Documented or reported cephalosporins Allergy?
- Yes → Notify receiving facility or contact Medical Control
- No → P: **Adult- 2 g IV Rocephin** over 10 minutes; **Pediatric- 50 mg/kg** to a max dose of **1 g IV Rocephin** over 10 minutes.

Hemorrhage

F	Apply direct pressure and elevate

Bleeding controlled?
- Yes → Notify receiving facility or contact Medical Control
- No →

F	Apply CAT® tourniquet
	Consider wound packing if unable to apply CAT® due to location of injury

Notify receiving facility or contact Medical Control

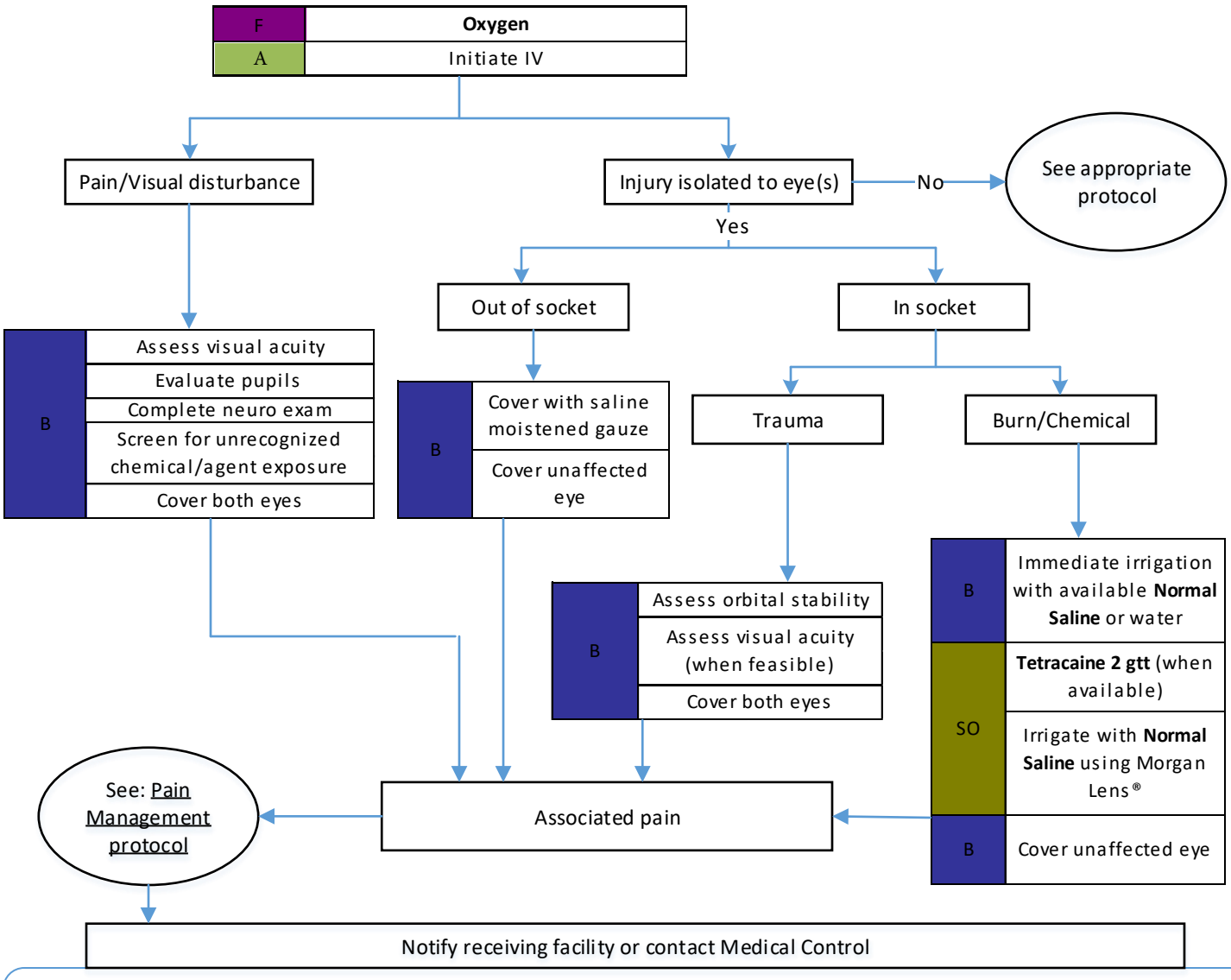
PEARLS:
- Peripheral neurovascular status is important.
- **In amputations, time is critical**. Transport and notify Medical Control immediately so that the appropriate destination can be determined.
- Hip dislocations and knee and elbow fracture/dislocations, have a high incidence of vascular compromise.
- 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**!

Eye Injuries / Complaints

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.

Head/Face Trauma

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

F	**Oxygen**; maintain O_2 sat >90% and $EtCO_2$ between 35 and 45
	Consider Spinal Immobilization
	Obtain and record GCS every 5 min
B	Obtain BGL
	12-Lead EKG
A	Initiate IV

Glucose <60 with signs of hypoglycemia → Yes → A: **10% Dextrose (D10) 250 mL IV**

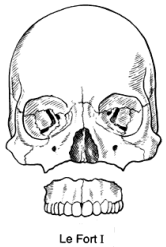
No → GCS < 8

GCS < 8 → Yes → P: Consider intubation

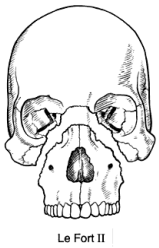
GCS < 8 → No

Consider intubation → Notify receiving facility or contact Medical Control

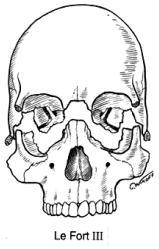
PEARLS:
- If GCS is less than 12 consider air/rapid transport.
- In the absence of capnography, hyperventilate the patient (adult: 20 breaths/min, child: 30 breaths/min, infant: 35 breaths/min) only if ongoing evidence of brain herniation (blown pupil, decorticate or decerebrate posturing, or bradycardia).
- 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.



Significant Findings:
Le Fort I
- Slight swelling
- Maxilla moves independently of the rest of the face
- Possible malocclusion



Significant Findings:
Le Fort II
- Massive edema, malocclusion
- Nose is obviously fractured
- Cerebrospinal fluid leak possible



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

Trauma

Heat Related Injuries

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	**Oxygen**
	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
	Consider ice packs to groin and axillae
B	12-Lead EKG
	Obtain BGL
A	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.

Hypovolemic Shock

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**
	Consider Spinal Immobilization
B	Activate Trauma alert
A	Initiate IV/IO; place 2nd IV/IO when feasible

Adult with severe external bleeding

Pediatric with severe external bleeding

Suspected internal bleeding with signs and symptoms of shock

See: Pain Management protocol

See: Extremity Trauma/ Amputation Protocol

A	Just enough **Normal Saline** to maintain a radial pulse (MAP of 60)
P	Consider pleural decompression

A	Once bleeding is controlled, administer **Normal Saline IV/IO** to achieve a B/P ≥90; **max 2,000 mL**

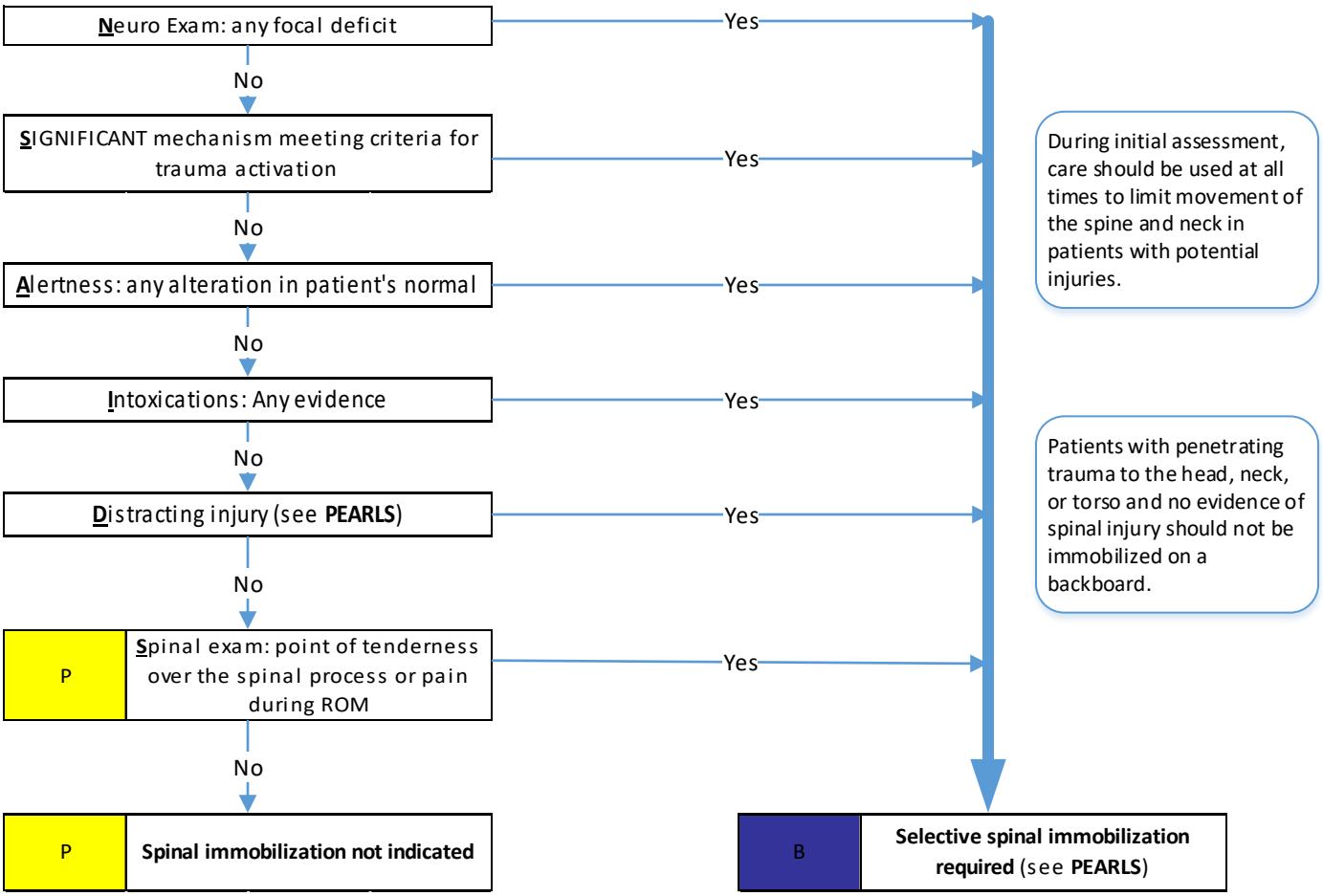
A	Once bleeding is controlled, administer **Normal Saline 20 mL/kg IV/IO**; **max 60 mL/kg or 1,000 mL**

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.

Selective Spinal Immobilization

10.11



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.

Traumatic Cardiac Arrest (Adult)

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 rescitation:
- 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.

Criteria for Death/DNR

Yes → **Withhold Resuscitation:**
- See **COG 1.4** for criteria for death/withholding resuscitation

M: Contact Medical Control or Coroner

No

	Rapid Transport
F	Immediate continuous compressions
B	Cardiac monitor/AED
A	Initiate IV/IO
B	Place BIAD and provide 10 breaths per minute
B	Treat correctable causes early
P	Perform bi-lateral pleural decompressions if penetrating or blunt force chest trauma

V-Fib/pulseless V-Tach

P	Defibrillate **200 joules, 300 joules, 360 joules**; all subsequent shocks at **360 joules**
P	Following 3rd shock, **Change Pad Position** and/or **Replace Pads** (Vector Change)
P	**Epinephrine 1 mg IV/IO;** repeat every 3-5 min
P	**Amiodarone (Cordarone) 300 mg IV/IO;** repeat once at 150 mg
A	1 Liter Normal Saline
A	Place 2nd IV/IO when feasible

PEA > 30

A	1 Liter Normal Saline
A	Place 2nd IV/IO when feasible

Return of spontaneous circulation

No → Consider Discontinuation of Prehospital Resuscitation Policy

Yes

Notify receiving facility or contact Medical Control

PEARLS:
- If cardiac arrest is believed to be caused by a medical etiology, follow medical cardiac arrest COG.
- Request blood products early.
- **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 $EtCO_2$ frequently, after every move, and at transfer of care.

Traumatic Cardiac Arrest (Pediatric)

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

Criteria for Death/DNR

Yes → **Withhold Resuscitation:**
- See **COG 1.4** for criteria for death/withholding resuscitation

→ M: Contact Medical Control or Coroner

No

	Rapid Transport
F	Immediate continuous compressions
B	Cardiac monitor/AED
A	Initiate IV/IO
B	Place BIAD and provide 20-30 breaths per minute
B	Treat correctable causes early
P	Perform bi-lateral pleural decompressions if penetrating or blunt force chest trauma

V-Fib/pulseless V-Tach

P	Defibrillate **2 joules/kg;** all subsequent shocks at **4 joules/kg**
A	**Normal Saline** or **Lactated Ringers 20 mL/kg IV/IO; max 60 mL/kg** or **1,000 mL**
P	**Epinephrine 0.01 mg/kg IV/IO;** repeat every 3-5 min
P	**Amiodarone (Cordarone) 5 mg/kg IV/IO**; may repeat twice not to exceed adult dose
A	Place 2nd IV/IO when feasible

PEA > 30

P	**Epinephrine 0.01 mg/kg IV/IO**; repeat every 3-5 min
A	**Normal Saline** or **Lactated Ringers 20 mL/kg IV/IO; max 60 mL/kg** or **1,000 mL**
	Place 2nd IV/IO when feasible

Return of spontaneous circulation

Notify receiving facility or contact Medical Control

PEARLS:
- **If cardiac arrest is believed to be caused by a medical etiology, follow medical cardiac arrest COG.**
- **Request blood products early.**
- **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 $EtCO_2$ frequently, after every move, and at transfer of care.

WMD-Nerve Agent

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.)

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

Minor Symptoms:
Salivation
Lacrimation
Visual disturbances

Major Symptoms:
Altered mental status
Seizures
Respiratory distress

P	**Atropine 2 mg IV/IM** every 5 min until symptoms resolve

Improving — No → (see Major Symptoms)

Yes →

B	**Nerve agent kit IM x3 rapidly** (see pediatric doses below)
P	If unconscious, seizing and/or fasciculating: **Lorazepam (Ativan) 1-2 mg IV/IM** (may be repeated once after 5 min) or **Midazolam (Versed) 10 mg/2 mL slow IV push**
	Atropine 2 mg IV/IM every 5 min until symptoms resolve

Notify receiving facility or contact Medical Control

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

Pediatric Trauma Triage & Transport

Patient < 16 years old

YES → 1

NO → Follow Adult Trauma Triage and Transport Guidelines !

1

- Inability to manage or secure airway/ oxygenation/ventilation
- Unmanageable signs/symptoms of shock
- Uncontrolled bleeding

YES → **Transport to GMMC. (Pediatric Trauma Center)**

NO ↓

2

- Pediatric Glasgow Coma Scale PGCS ≤ 13
- Decreased Level of Responsiveness (See AVPU Scale)
- Penetrating trauma to head, neck, torso, or extremities proximal to knee or elbow
- Proximal Long bone fractures - crushed, mangled, or degloved extremity - Amputation proximal to the wrist or ankle - Pelvic fractures
- Open or depressed skull fractures
- Indications of significant closed head injury
- Paralysis
- Ejection of patient
- Indications of significant Chest or Abdominal Trauma
- Auto vs. Pedestrian >20 mph

YES → Transport to **GMMC** * if within **60** minutes by ground → YES → **Transport to GMMC**

NO ↓ → Transport to Closest Trauma Center

NO ↓

3

- Fall > 10 feet or 2-3 times the height of a child
- MVA with Intrusion >12 inches roof; > 18 inches passenger compartment (as outlined in 2011 CDC guideline)
- Ejection from the vehicle (other occupant)
- Death in same vehicle
- Mechanism consistent with high risk of injury
- Inadequately restrained
- Another occupant of the same vehicle is transported to a high level trauma center
- Auto vs. Pedestrian <20 mph
- Motorcycle or motorized recreational vehicle

YES → Transport to **GMMC**, if within **30** minutes by ground → YES → **Transport to GMMC**

NO ↓

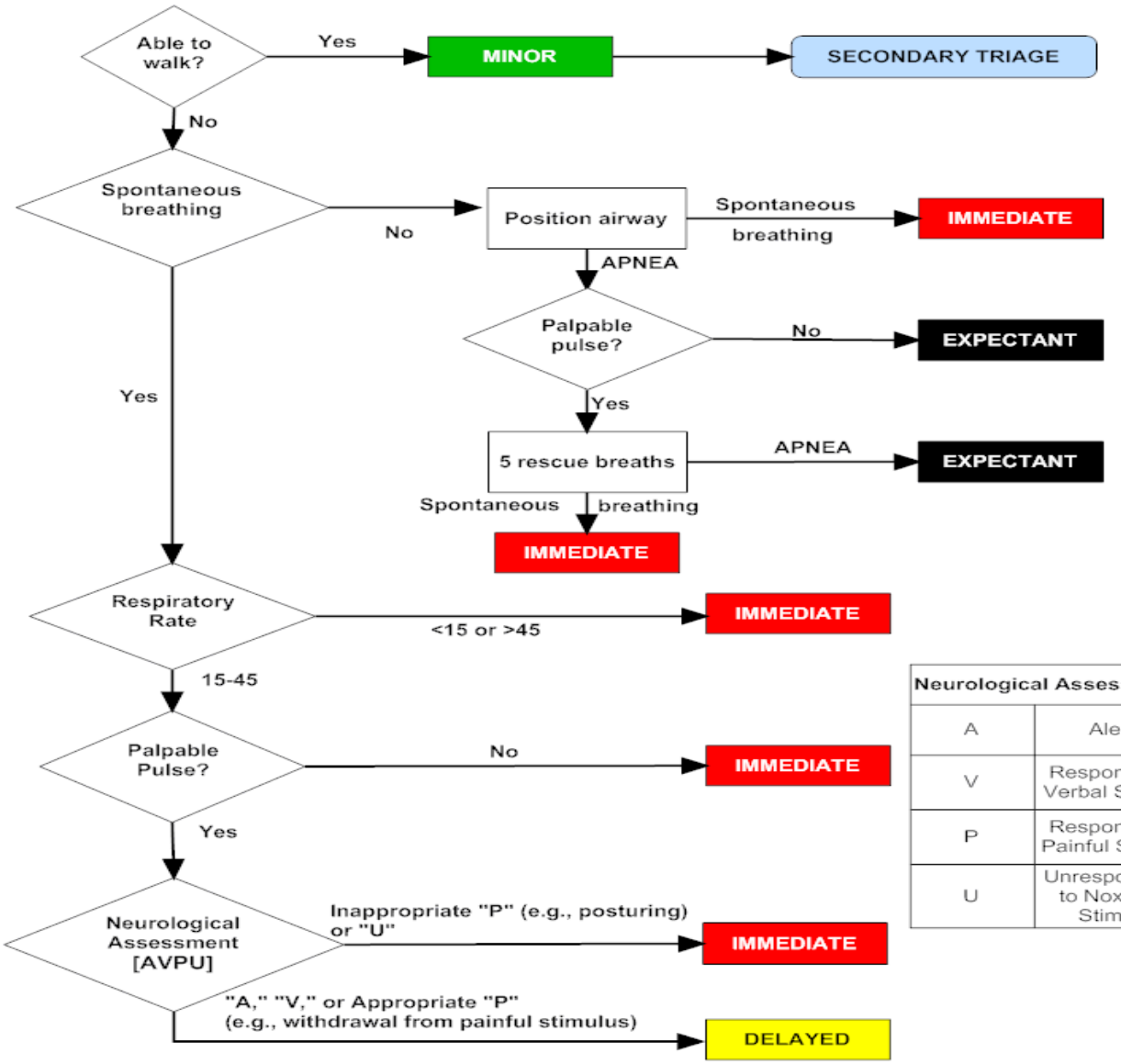
4

SPECIAL CIRCUMSTANCES
Burns
Pregnancy > 20 Weeks

- Without other trauma mechanism: triage to appropriate facility
- With trauma mechanism: triage to trauma center

NO → ***Any Injury not mentioned above shall be triaged and transported based on the EMS provider judgement – preferably with online medical direction – and according to local Protocols***

JumpSTART Pediatric Multiple Casualty Incident Triage



Neurological Assessment	
A	Alert
V	Responds to Verbal Stimuli
P	Responds to Painful Stimuli
U	Unresponsive to Noxious Stimuli

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

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

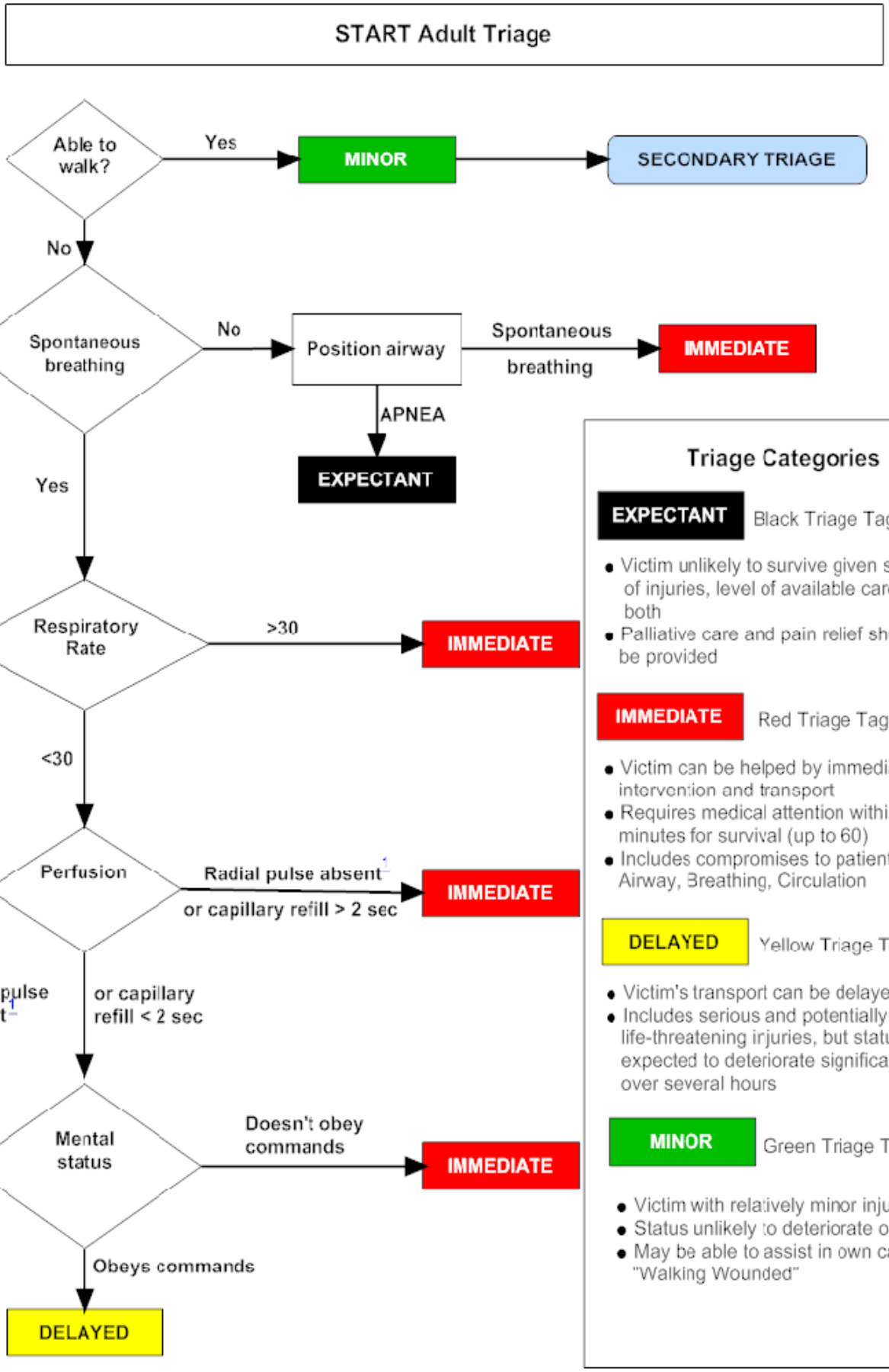
IMMEDIATE Red Triage Tag Color

- 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

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 Triage



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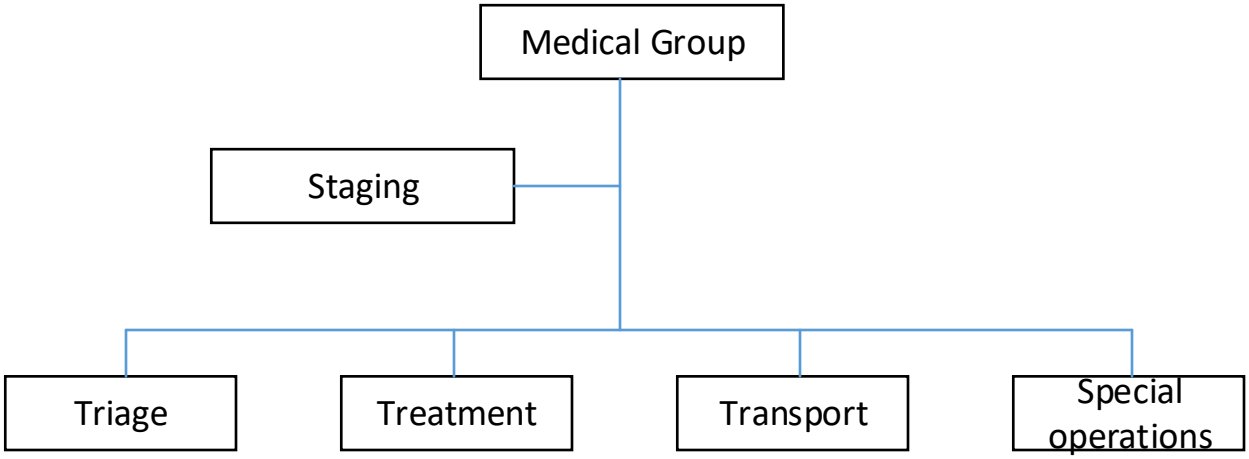
- Status unlikely to deteriorate over days
- May be able to assist in own care: "Walking Wounded"

Incident Command

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

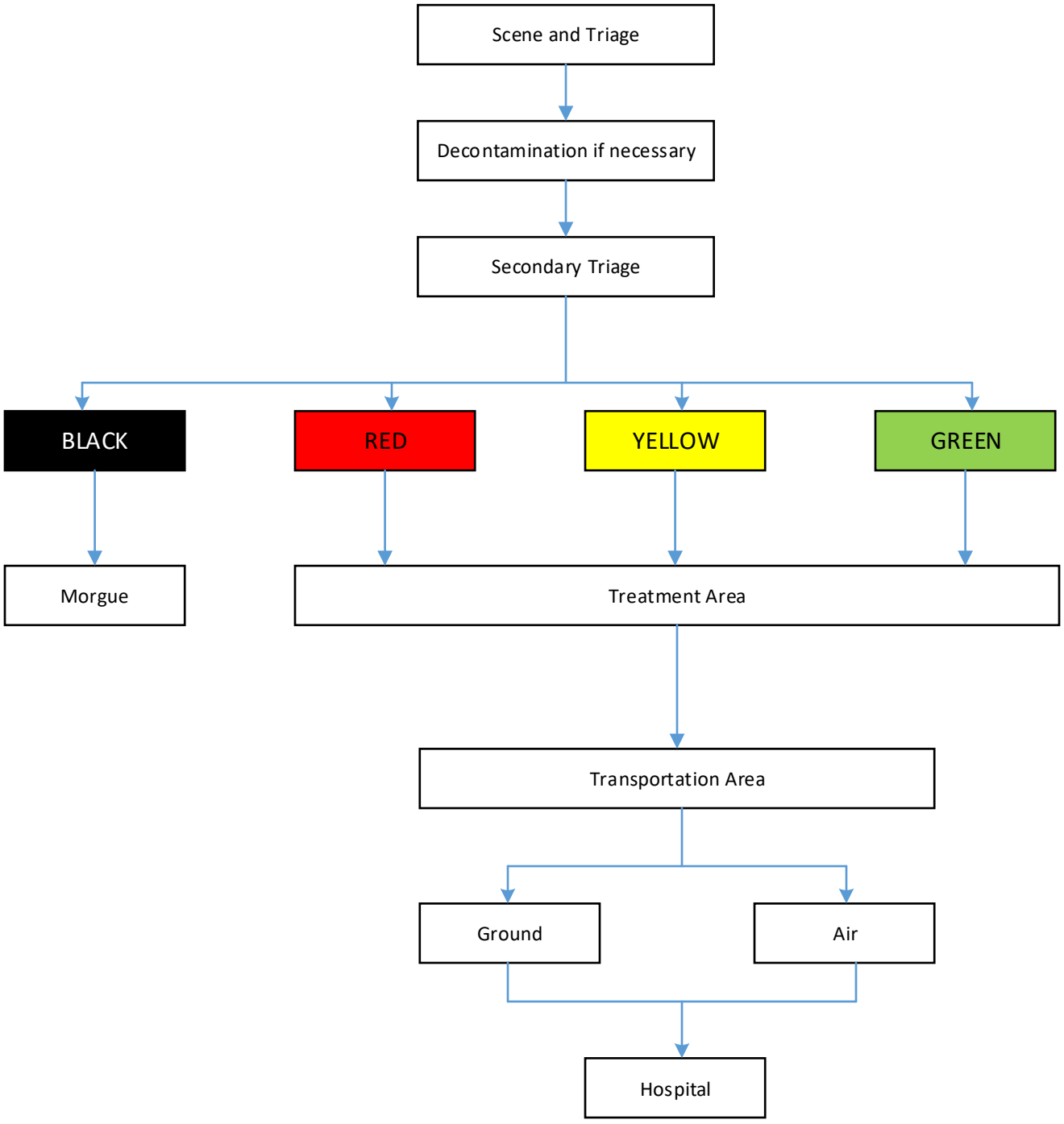
- Fast Attack Command: A small scale incident which can be managed by a Medical Group Supervisor. One person may assume more than one function (i.e., Triage, treatment, etc.).
- Fixed Command: Larger events (based on size, complexity, or potential for rapid expansion), that require an early stationary 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**).

Patient Flow Diagram During Incident Command



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.

Field Triage and Bypass

Assessment of Serious Signs / Symptoms
ABC and LOC

Measure Vital Signs and Level of Consciousness

- Glasgow Coma Scale < 13
- Systolic Blood Pressure < 90 mmHg
- Respiratory Rate < 10 or > 29 Breaths / min
- Need for Ventilatory Support
- Rate < 20 in infant age < 1 Year

YES → Transport to closest designated trauma center available. Air transport or bypass of Level 3 Trauma Center to Level 1 or Level 2 Trauma Center should be considered if distance and circumstances are appropriate and/or no Level 3 Trauma Center is available

NO → **Assess anatomy of injury:**

- Penetrating injuries to head, neck, torso or extremity to elbow and knee
- Chest wall instability/deformity (e.g.Flail Chest)
- Crush, de-gloved, mangled or pulseless extremity
- Amputation proximal to wrist or ankle
- Pelvic fracture
- Paralysis
- Open or depressed skull fracture
- Two or more proximal long bone fractures

YES → Transport to closest designated trauma center available. Air transport or bypass of Level 3 Trauma Center to Level 1 or Level 2 Trauma Center should be considered if distance and circumstances are appropriate and/or no Level 3 Trauma Center is available

NO → **Assess mechanism of injury and evidence of high energy impact:**

Falls:
- >20 ft. in adult (one story = 10 feet)
- > 10 ft. or two to three times the height of a child

High Risk Auto Crash:
- Intrusion including roof: > 12 inches occupant side or > 18 inches any site
- Ejection (partial or complete) from automobile
- Death in same passenger compartment
- Vehicle telemetry data consistent with a high risk of injury
- **Pedestrian or bicyclist struck by vehicle, thrown, run over, or with impact > 20 MPH**
- **Motorcycle crash > 20 MPH**

YES → Transport to closest designated trauma center available. **A lower level Trauma Center should not be bypassed to transport to a higher level Trauma Center.** If no Trauma Center is available, transport to the closest appropriate hospital Emergency Department for evaluation and transfer as necessary.
Air Transport from incident scene is rarely appropriate

NO → **Assess special patient or system considerations:**

Older Adults:
- Risk of injury/death increases > age 55
- SBP < may represent shock after age 65
- Low impact mechanisms (e.g. ground level falls) may result in severe injury

Children:
- Should be triaged preferntially to pediatric capable trauma centres
- **Pregnancy > 20 weeks**

Anticoagulants / bleeding disorders:
- Patients with head injury are at high risk for rapid deterioration

Burns:
- Without other trauma mechanism: triage to burn facility
- With trauma mechanism: triage to trauma center
- **EMS provider judgment**

YES → Transport to closest designated trauma center available. **A lower level Trauma Center should not be bypassed to transport to a higher level Trauma Center.** If no Trauma Center is available, transport to the closest appropriate hospital Emergency Department for evaluation and transfer as necessary.
Air Transport from incident scene is rarely appropriate

NO → Transport according to usual Transport Protocol

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
A/C	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

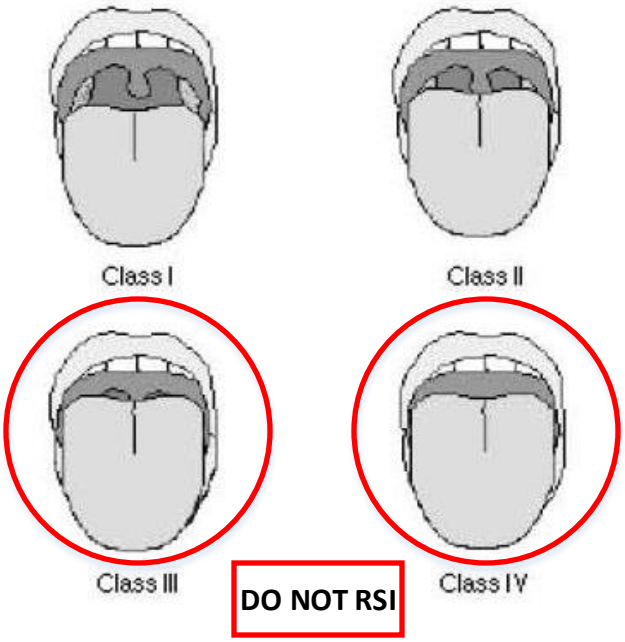
Evaluating for the difficult airway (LEMON)

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.

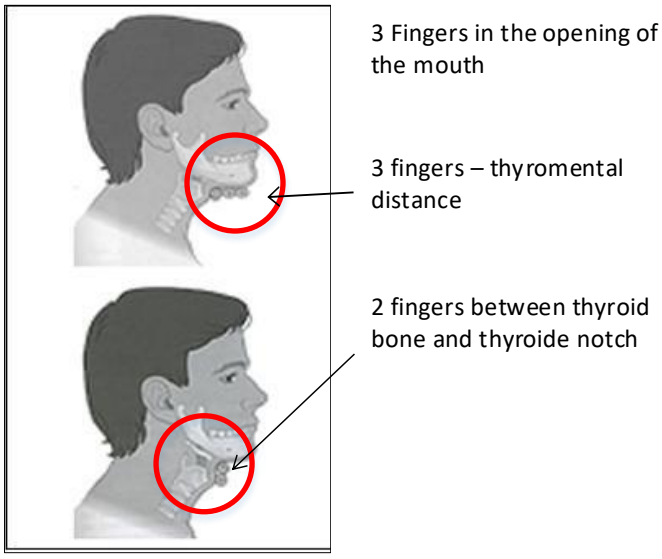
Look Externally: External indicators of either difficult intubation or difficult ventilation include: presence of a beard or moustache, abnormal facial shape, edentulous mouth, facial trauma, obesity, large front teeth or "buck teeth", high arching palate, receding mandible, short bull neck.

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 –

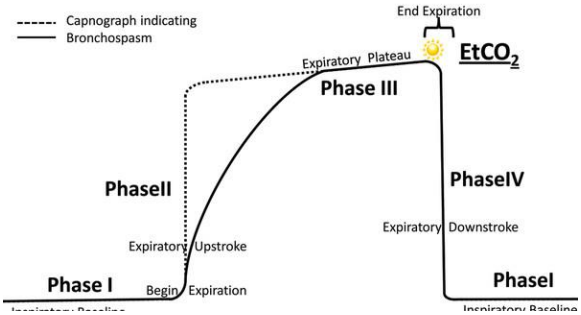


3-3-2 Rule

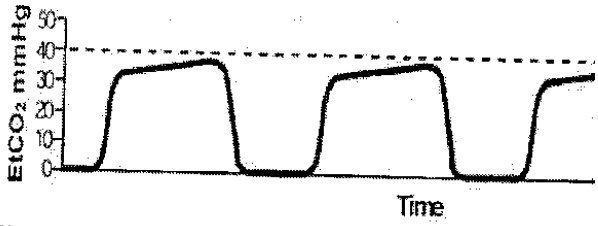


Obstruction: Besides the obvious difficulty if the airway is obstructed with a foreign body, the Paramedic should also consider other obstructers such as tumor, abscess, epiglottis, or expanding hematoma.
Neck Mobility: Ask the patient to place their chin on their chest and to tilt their head backward as far as possible. Obviously, this will not be possible in the immobilized trauma patient.

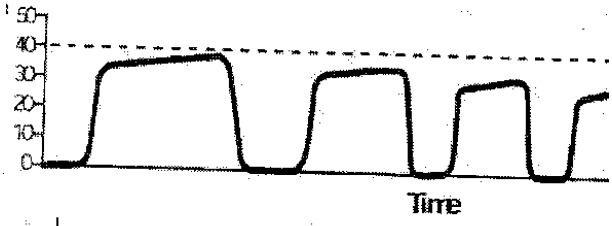
Capnography Waveform

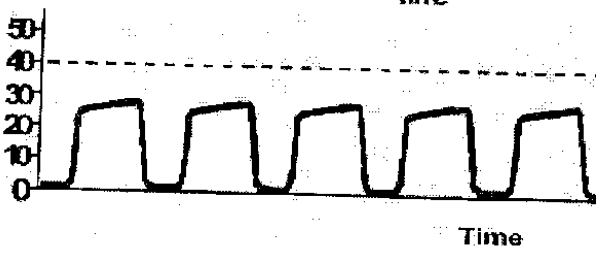


Normal Capnograph

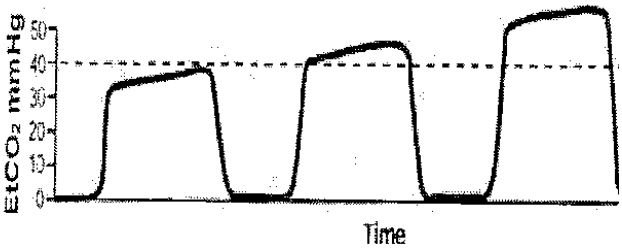


Hyperventilation

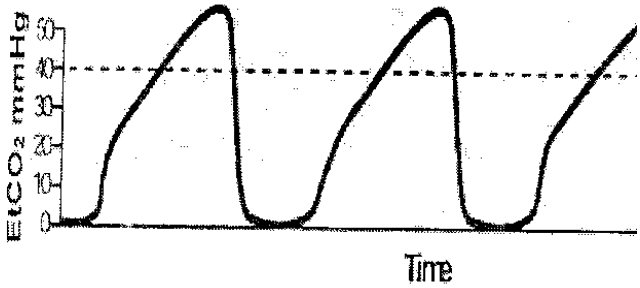




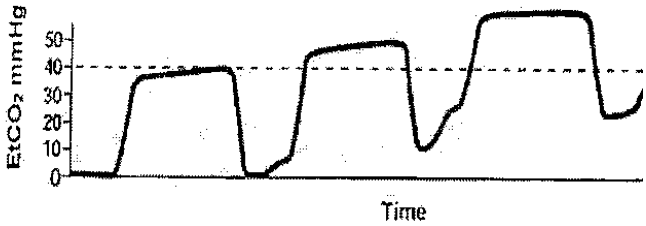
Hypoventilation



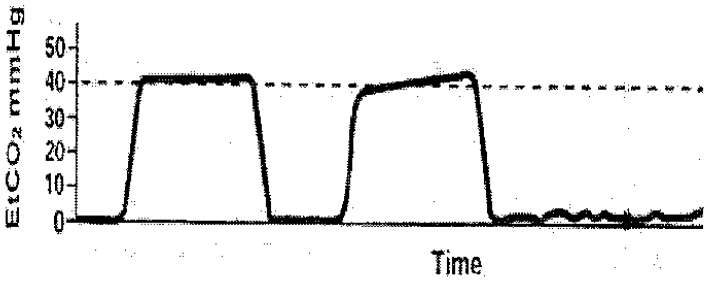
Bronchospasm
(COPD, Asthma, etc.).



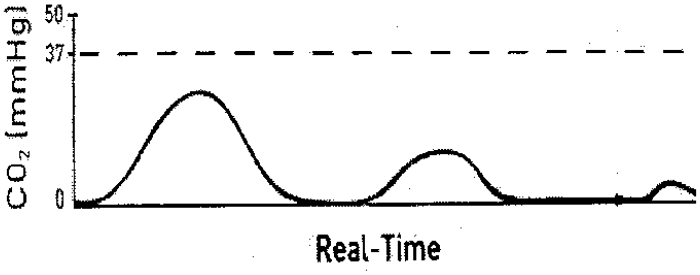
Elevated Baseline
(Incomplete Inhalation/Exhalation)



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



Esophageal Intubation



Common Lab Values

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

HEMATOLOGY

	Male:	Female:	Child:
RBC	4.2-5.6 M/uL	3.8-5.1 M/uL	3.5-5 M/uL
WBC	3.8-11.0 K/mm³	3.8-11.0 K/mm³	5-10K/mm³
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

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

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

Hospital Numbers

Hospital	Radio Code		Map Code
Greenville Memorial	Code 36		49J
Greer Memorial	Code 38		37A
Pelham Medical Center	N/A		45H
St. Francis Downtown	Code 40		43R
St. Francis Eastside	Code 41		41X
St. Francis Simpsonville	N/A		N/A
Hillcrest	Code 37		75T
Palmetto Baptist	N/A		N/A
North Greenville	Code 39		18B
Patewood	N/A		N/A

Utilize mobile application on truck phone when calling report to the receiving hosptial.

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 Hosptial Facility → PMC
Post cardiac arrest patients	Greenville Memorial → SFH Downtown
Sexual assault patients	Any Prisma Health Facility → Any St. Francis Hosptial Facility
Dialysis patients w/ dialysis related complaint	Greenville Memorial → SFH Downtown
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 Hosptial 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 facilitates.
- **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 Hosptial 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 Hosptial 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

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

Signal Codes

List of Chief Complaints:

1 Abdominal Pain/Problems
2 Allergies (Reactions)Envenomations
3 Animal Bites/Attacks
4 Assault/Sexual Assault
5 Back Pain (Non-tramuatic 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/Outbreatk (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 **A**rterial o**C**clusion **E**valuation **S**cale

ITEM	Instruction	Result	Score	HIHSS Equivalent
Facial Palsy	Ask patient to show their teeth (smile)	**Absent** (symmetrical movement) **Mild** (slight asymmetrical) **Moderate to severe** (completely asymmetrical)	0 1 2	0-3
Arm Motor Function	Extending the arm of patient 90° (if sitting) or 45° (if supine)	**Normal** to **Mild** (limb upheld more than **10** seconds) **Moderate** (limb upheld less than **10** seconds) **Severe** (patient unable to raise arm against gravity)	0 1 2	0-4
Leg Motor Funtion	Extending the leg of the patient 30° (in supine)	**Normal** to **Mild** (limb upheld more than **5** seconds) **Moderate** (limb upheld less than **5** seconds) **Severe** (patient unable to raise leg against gravity)	0 1 2	0-4
Head & Gaze Deviation	Observe eyes and head deviation to one side	**Absent** (eye movements to both sides were possible and no head deviation was observed) **Present** (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.	**Normal** (performs both tasks requested correctly) **Moderate** (performs only 1 of 2 tasks requested correctly) **Severe** (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?"	**Normal** (recognizes arm and attempts to move arm) **Moderate** (does not recognize arm **or** is unaware of arm) **Severe** (does not recognize arm **and** 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

12 Lead Differentials

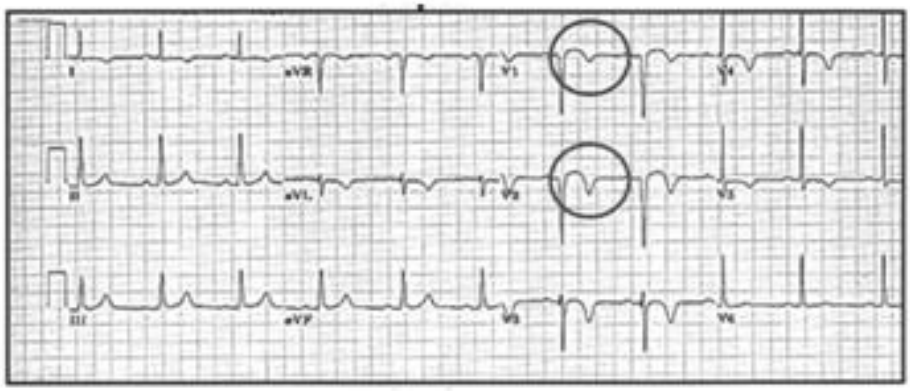
Lead I	aVR	V1	V4
Lead II	aVL	V2	V5
Lead III	aVF	V3	V6

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

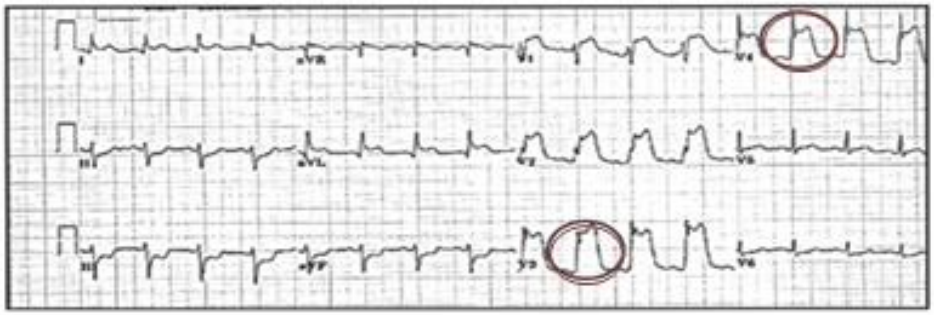
ST elevation 2, 3, AVF

Septal MI



ST elevation V1 & V2

Anterior MI

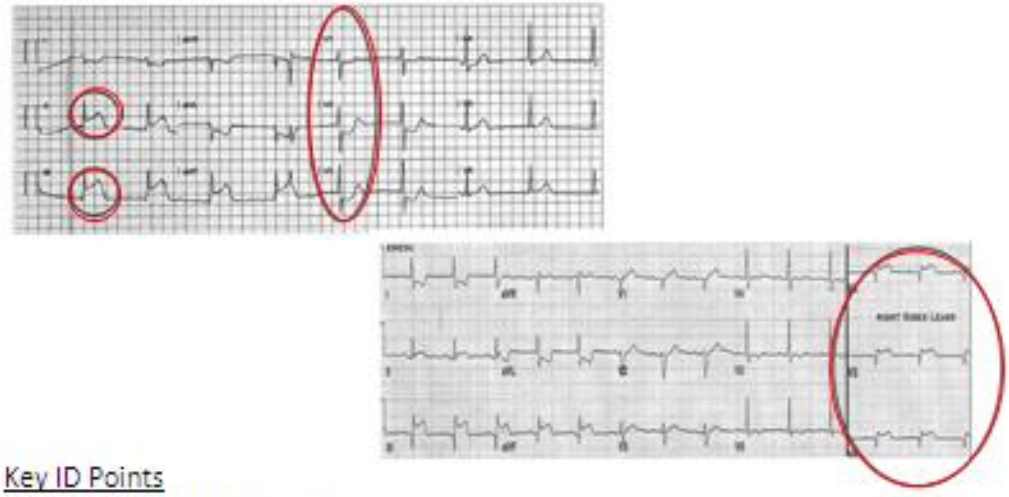


ST elevation V3 & V4

Lateral MI

ST elevation V5 & V6, I & aVL

Inferior MI with Right Ventricular Involvement

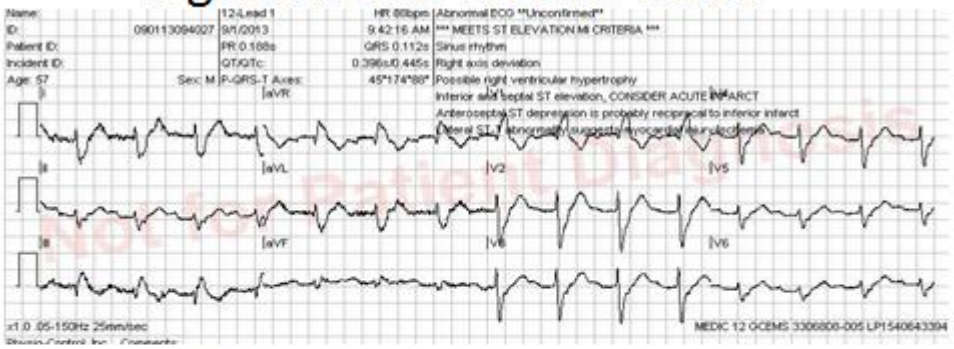


Key ID Points

- ST elevation in III > II
- Reciprocol 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
Normal Axis 0 to 90	∧	∧	∧	
Physiologic Left Axis 0 to -40	∧	∧ ∧	∨	
Pathological Left Axis -40 to -90	∧	∨	∨	**Anterior Hemiblock**
Right Axis 90-180	∨	∧ ∨	∧	**Posterior Hemiblock**
Extreme Right Axis	∨	∨	∨	**Ventricular Origin**

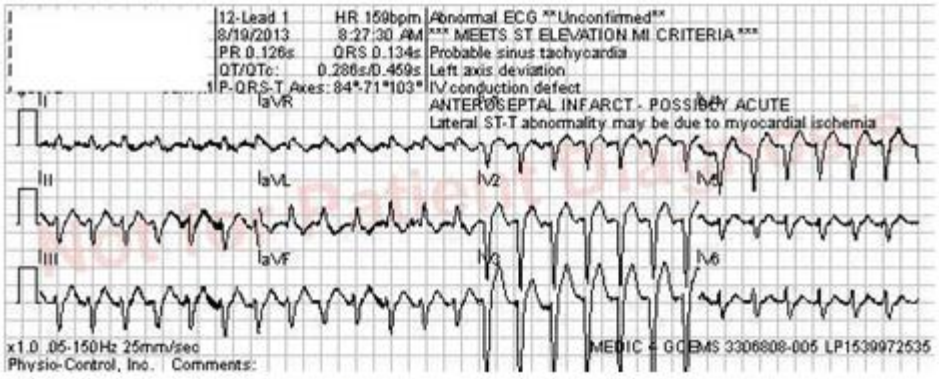
Right Bundle Branch Block



Key ID Points

- QRS looks wide with duration >120
- From J point read V1, right to left
- If 1st 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

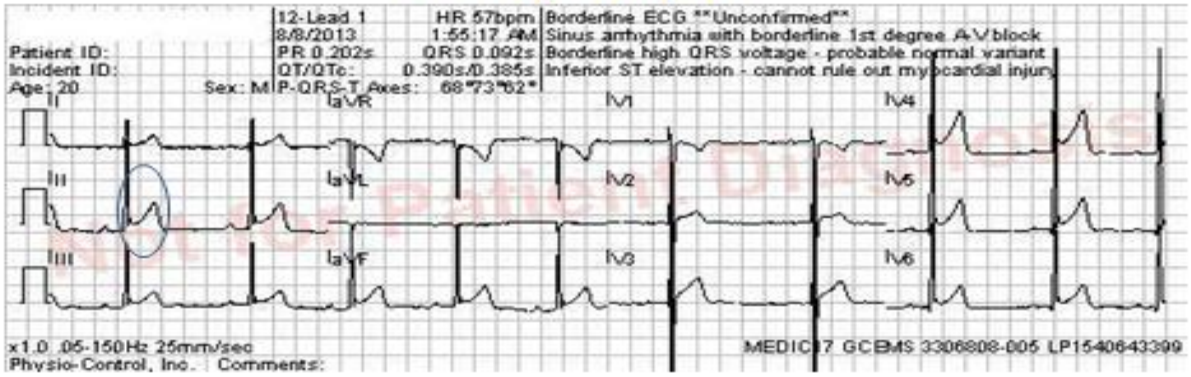
- QRS looks wide with duration >120
- From J point read V1, right to left
- If 1st deflection from J point is down = LBBB
- LBBB is not a STEMI

Left Ventricular Hypertrophy

Voltage Based Criteria

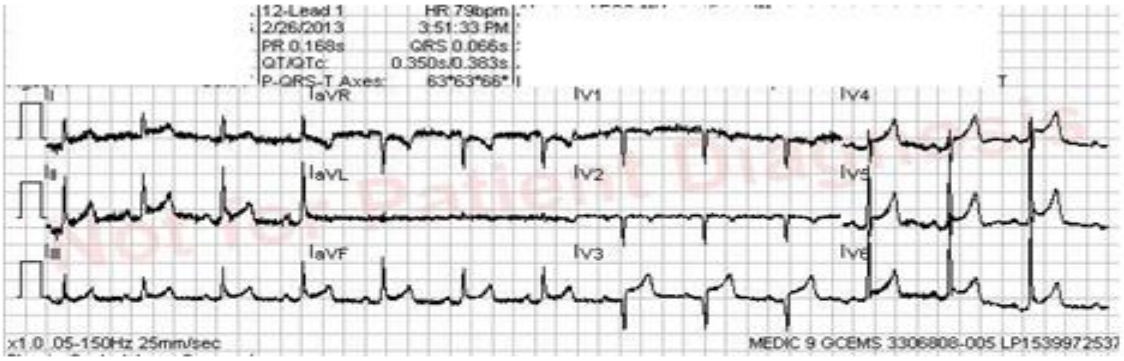
- Lead 1: R wave >14
- Lead aVR: S wave >15
- Lead aVL: R wave >12
- Lead aVF: R wave >21
- Lead V5: R wave >26
- Lead V6: R wave >20

Early Repol



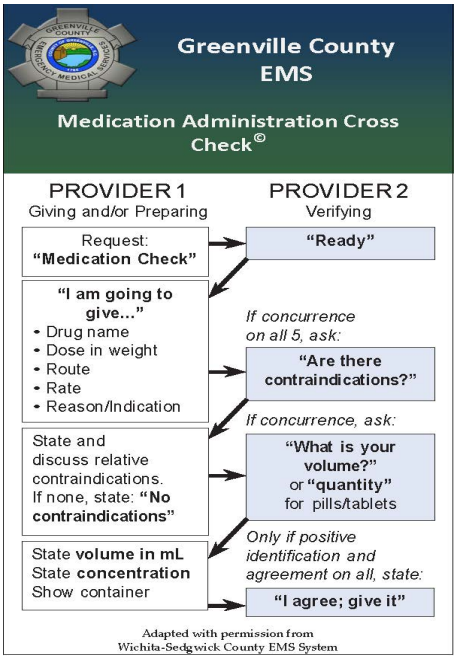
- Depressed and lengthened PR interval
- Concave ST segment elevation
- Global or not following strain pattern
- May or may not experience pain

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, Panodol)
Adenosine (Adenocard)
Albuterol Sulfate (Ventolin/Proventil)
Amiodarone (Cordarone)
Aspirin (Children's chewable aspirin)
Atropine Sulfate
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)
Metoproplol (Lopressor)
Midazolam (Versed)
Morphine Sulfate
Naloxone (Narcan)
Nitroglycerin (Nitro-Bid, Nitrostat, Nitron)
Nitrous Oxide (Nitronox)
Norephinephrine (Levophed)
Oxytocin (Pitocin)
Oxygen
Piperacillin / Tazobactam (Zosyn)
Pralidoxime (Protopam)
Racemic Epinephrine (MicroNEFIN, Vaponephrine)
Rocuronium (Zemuron)
Sodium Bicarbonate (NaHCO3) Sodium Chloride 0.9% (Normal Saline)
Succinylcholine (Anectine)
Terbutaline (Brethine)
Tetracaine (Opthalmic Drops)
Toradol (Ketorolac)
Vecuronium Bromide (Norcuron)
Ziprasidone (Geodon)
Zofran (Ondansetron)



Trauma Activation Criteria (Adult)

Level I Criteria – Adults (Ages 16-64)

1. Glasgow coma score (GCS) ≤ 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 ≥ 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) ≤ to 11
2. Injury with associated tachycardia & poor perfusion
3. Systolic BP ≤ 70 + 2x (age in years) up to 10 years

a. 11 – 17 years - systolic B/P ≤ 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 ≥ 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

Trauma Activation Criteria (Geriatrics)

12.16

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) ≤ to 11
2. Injury with associated tachycardia & poor perfusion (HR ≥ 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 ≥ 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 ≥ 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, 2nd or 3rd 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 of nebulizer mask; may repeat once for a total of 10mg

  Requires OLMC for EMT to repeat dose.

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

  Requires OLMC for EMT to repeat dose.

Drugs	Adult	Pediatric
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 • 2nd or 3rd degree AV blocks **Side Effects:** Hypotension, bradycardia, AV block, asystole, PEA, hepatoxicity	**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 **Termination of VF/VT:** • 5mg/kg IV/IO over 20 minutes • Place amount of medication in 50 mL of NS or D5W, administered through a 10 gtt set over 20 minutes. • Repeat doses of 5mg/kg IV/IO over 20 minutes; maximum 15mg/kg
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 black or vagal activity; 2nd 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

Drugs	Adult	Pediatric
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
Dextrose 10% (D10) **GCEMS Protocol:** Multiple **Indications:** • Suspected hypoglycemia • Altered LOC • Coma/seizure of unknown etiology **Contraindications:** • Intracranial hemorrhage • Known CVA **Side Effects:** Local irritation, may precipitate severe neurologic symptoms in alcoholics	• 250 mL IV; may repeat once if still unresponsive and low BGL	• 5 mL IV; may repeat once if still unresponsive and low BGL
Dextrose 50% (D50, 50% Dextrose) **GCEMS Protocol:** Multiple **Indications:** • Suspected hypoglycemia • Altered LOC • Coma/seizure of unknown etiology **Contraindications:** • Intracranial hemorrhage • Known CVA **Side Effects:** Local irritation, may precipitate severe neurologic symptoms in alcoholics, causes local tissue necrosis if IV infiltrates	• 25 Grams slow IV/IO administration given on a case by case basis per Paramedic discretion	• Diluted (1:1) with NS; for a concentration of D25 • Dose of 0.5-1 Grams/kg (2-4 mL/kg) slow IV/IO or rectum administration • **Given on a case by case basis per Paramedic discretion**
Diazepam (Valium) **GCEMS Protocol:** Alternative to Lorazepam in cases of drug shortage **Indications:** • Major motor seizures • Status epilepticus • Premedication prior to cardioversion, transcutaneous pacing • Skeletal muscle relaxant • Acute anxiety states • Medication for combative patients and difficult intubations **Contraindications:** • Respiratory depression **Side Effects:** Respiratory/cardiac arrest, decreased LOC, hypotension	• 1-5 mg IV/IO/IM to a maximum of 10 mg	• 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

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 **Metoproplol 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 • Uticaria • Extra pyramidal reaction **Contraindications:** • Asthma • COPD • Pregnancy • Nursing mothers • Acute glaucoma **Side Effects:** Sedation, dries bronchial secretions, blurred vision, headache, palpatations	• 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

Drugs	Adult	Pediatric
Epinephrine (Adrenalin) **GCEMS Protocol:** Multiple **Indications:** • V-fib / Pulseless V-tac • Asystole • Pulseless electrical activity (PEA) • Anaphylaxis • Brochospasm **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	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 can repeat once. Max single dose of 100 mcg, Max Dose 200 mcg	• Age > 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****

Drugs	Adult	Pediatric
Glucagon (GlucaGen) **GCEMS Protocol:** Multiple **Indications:** • Hypoglycemia • Beta blocker overdose **Contraindications:** • Hypersensitivity • Insulinoma • Pheochromocytoma **Side Effects:** Relatively free of adverse reactions except for occassional nausea/vomity; 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 ≥210 or ≥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; 30mg max single dose; may repeat once after 15 minutes.	Not approved

Drugs	Adult	Pediatric
Levophed (Norephinephrine) **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

Drugs	Adult	Pediatric
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:** • 5 mg IV **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

Drugs	Adult	Pediatric
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
Naloxone (Narcan) **GCEMS Protocol:** Poisoning/OD (Adult & Pediatric) **Indications:** • Narcotic Overdoses • Synthetic analgesic overdoes **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

Drugs	Adult	Pediatric
Nitrous Oxide (Nitronox) **GCEMS Protocol:** adult and pediatric Pain Managment **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 arrythmias	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 (NaHCO3) **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 PCO2	• 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
Succinycholine (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

Drugs	Adult	Pediatric
Tetracaine (Opthalmis 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
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

Drugs	Adult	Pediatric
Zemuron (Rocuronium) **GCEMS Protocol:** Airway RSI/DSI **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-pyramdal 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.